FARROKH MISTREE

L. A. COMP CHAIR AND PROFESSOR
THE SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING
UNIVERSITY OF OKLAHOMA, NORMAN, OKLAHOMA
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MAY 2023

FOR NUMBERS SEE SCORE CARD ON PAGE 87

I EARNED DEGREES

Ph.D.	1974	U. of California (Berkeley)	Engineering
M.S.	1970	U. of California (Berkeley)	Engineering
B.Tech. (Hons.)	1967	I.I.T. Kharagpur (India)	Naval Architecture

II EMPLOYMENT

L.A. Comp Chair and Professor	School of Aerospace and Mechanical Engineering	Since 8/09
Director	School. of Aerospace and Mechanical Engineering University of Oklahoma, Norman	8/09 to 8/13
Professor	Georgia Institute of Technology, Atlanta	9/92 – 7/09
Associate Chair	Woodruff School of Mechanical Engineering Georgia Institute of Technology – Savannah	July 1, 2005 December 15, 2008
Professor	University of Houston, Houston	9/87-8/92
Associate Professor	University of Houston, Houston	1/81- 8/87
Senior Lecturer	University of New South Wales, Sydney, Australia	6/80 - 1/81
Lecturer[1]	University of New South Wales, Sydney, Australia	2/76 - 5/80
Post-Doctoral Research Fellow	University of New South Wales, Sydney, Australia	3/74 - 1/76
Senior Engineering Aid	University of California, Berkeley	10/72 - 9/73
Research Assistant	University of California, Berkeley	8/68 - 6/72

[1] Tenured in 1977.

III STUDENTS MENTORED

A. Individual Mentoring

Systems Realization Laboratory @ University of Oklahoma. Spring 2023

Ph.D. Student

1. Mayank Bhalerao, working towards a PhD in ISE. *On public policy as an evolving cyber-physical-social system.* Started August 2022. Target date for completion: Summer 2026. Co-advisor: Janet K. Allen, ISE.
2. Siavash Mandegari working towards a PhD in ISE. *On sustainable development as an evolving cyber-physical-social system*. Started August 2023. Target date for completion: Summer 2026**.** Co-advisor Janet K. Allen, ISE.

M.S.

3. Sara Hajihashemi working towards a MS in ISE. *Designing, Implementing, and Testing a User-Friendly Wrapper for DSIDES* Started Spring 2021. Target date for completion: Summer 2023. Co-advisor Janet K. Allen, ISE.

Completed at the University of Oklahoma (since 2009)

Post-doctoral research associates

1 Chung Hyun Goh, PhD. *On integrated realization of engineered products and materials from which they are made.* Started Fall 2012. Completed Summer 2015.

2 Zhenjun Ming. *On developing a cloud-based platform for decision support*. PhD. Started Fall 2018. Completed August 2020.

3 Rajlakshmi Nayak, Assistant Professor, JK Lakshmipat University, Jaipur, India. Funded by the Department of Science and Technology, India. Co-advised with J.K. Allen. Since October 2022 to March 2023. Topic: *Designing a Family of Microfluidic Devices*. Home Department: Aerospace and Mechanical Engineering.

PhD

1. Reza Alizadeh, (PhD ISE)[2]. "Managing Computational Complexity Through Using Partitioning, Approximation and Coordination.". Started January 2017. Advanced to candidacy Fall 2018. Completed August 2022. Co-advisor: Janet K. Allen, ISE.

2. Lin Guo (PhD ISE)[3]. *Model Evolution for the Realization of Complex Systems.* Started August 2016. Advanced to candidacy Fall 2018. Completed August 2021. Co-advisor: Janet K. Allen, ISE. Assistant Professor, South Dakota School of Mines and Technology, Rapid City, South Dakota, USA

3. Jelena Milisavljevic (PhD ME). *Architecting Networked Engineering Systems.* Started January 2016. Completed: Fall 2018. Co-advisors: Janet K. Allen, ISE and Sesh Commuri, ECE U. of Nevada, Reno. Lecturer (Assistant Professor), Industrial Design, School of Engineering, University of Liverpool, Liverpool, UK.

4. Anand Balu Nellippallil (PhD ME)[4]. *The Integrated Realization of Engineered Materials, Products, and Associated Manufacturing Processes.* Started Fall 2014. Advanced to candidacy: Fall 2016. Completed Fall 2018. Co-advisor: Janet K. Allen, ISE. Assistant Professor, Florida Institute of Technology, Melbourne, Florida, USA.

5. Ru Wang (PhD ME). Visiting scholar for 12 months from Beijing Institute of Technology, Beijing. *Knowledge-Based Product Design Decision Process Modeling Method.* At SRL@OU from December 2016 to November 2017. Completed June 2018. Co-advisor: Janet K. Allen, ISE and Guoxin Wang, Beijing Institute of Technology. Assistant Professor, Beijing Institute of Technology, Beijing, China.[5]

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[2] 2022 -Provost's Outstanding Dissertation Award (Engineering and Science)

[3] 2021 Provost's Outstanding Dissertation Award (Engineering and Science)

[4] 2018 Provost's Outstanding Dissertation Award (Engineering and Science)

[5] Included for completeness.

6. Shabnam Rezapour (PhD ISE)[6]. *Architecting Fail-Safe Supply Networks.* Started Fall 2012. Advanced to candidacy in Fall 2013. Completed Spring 2017. Co-advisor: Janet K. Allen, ISE. Assistant Professor, Florida International University, Miami, Florida, USA.
7. Zhenjun Ming. PhD, Beijing Institute of Technology, Beijing. *Study of Product Design Knowledge Modeling Methods for Decision Making.* Started Fall 2014. Completed December 26, 2016. Co-advised with Professor Yan, Associate Professor Guoxin Wang and Professor Janet K. Allen.[1] Assistant Professor, Beijing Institute of Technology, Beijing, CHINA.
8. Amirhossein Khosrojerdi (PhD, ISE). *Resilient and Structural Controllability of Multi-Level Infrastructure Networks under Disruptions with Examples from Energy Industries.* Started Fall 2011. Advanced to candidacy in Fall 2013. Completed Spring 2015. Discover Financial Services, Chicago, Illinois, USA.

M.S.

1. Shan Peng, MS DSA. *Analysis of Engineering Students Self-Reflections through Text Mining of Their Learning Statements* . Started Fall 2018. Completed May 2021. Co-advisor Janet K. Allen, ISE.
2. Gehendra Sharma, MS ME. *Designing Coupled Engineered Systems Under Uncertainty.* Started Fall 2017. Completed May 2020. Co-advisor Janet K. Allen, ISE. Research Engineer II, Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Starkville, Mississippi, USA.
3. Vishnu Kamala, MS ISE. *A Computational Framework to Foster Sustainable Rural Development in Off-Grid Villages.* Started Fall 2018. Completed May 2020. Co-advisor Janet K. Allen, ISE.
4. Jackson L. Autrey MS ME. *Assessment of Learning by Reflecting on Doing.* Started Fall 2015. Graduated May 2019. Co-advisor Zahed Siddique.
5. Ali Shahbazi. Started January 2017. Completed May 2019 without thesis. Funded.
6. Abhishek Yadav MS ISE. *A Framework for Developing Proposals by Social Entrepreneur for Development of Rural India.* Started Summer 2016. Graduated August 2018. Co-advisor: Janet K. Allen, ISE. Systems Researcher, Tata Consultancy Services Research, Pune, India.
7. Dallas Milligan MS ME. *Investigation into Oilfield Waste Water Disposal Through Eutectic Freeze Crystallization.* Baker Hughes Scholar. Graduated April 2018. Drilling and Subsurface Engineer, ExxonMobil Development Company, Spring, Texas, USA.
8. Xiwen Shang, MS ME. Visiting scholar for 9 months from Beijing Institute of Technology, Beijing. *A Computational Framework for Designing Reconfigurable Machine Tools.* Started December 2016. Left September 2017. Graduated with MS in March 2018. Co-advisors: Janet K. Allen, ISE and Guoxin Wang, Beijing Institute of Technology.[1]
9. Maryam Sabeghi MSME. *Solution Space Exploration in Model-Based Realization of Engineered Systems.* NSF Graduate Research Fellow. Started May 2013. Graduated May 2016.
10. Jelena Milisavljevic MSME. *Accounting for Uncertainty in the Realization of Multistage Manufacturing Processes*. Started August 2013. Graduated December 2015.
11. Salman Ahmed MSME. *Exploration of Feasible Design in Hot Forging Process of Automobile Steel Gear.* Started Fall 2011. Graduated December 2013.
12. Minting Xiao MS ISE. Started Fall 2010 as thesis MS student. Graduated 2012 MS without a thesis.

B.S. Undergraduate Honors Thesis

1. Jacob S. Starks. BS CEES Spring 2022. Honors Thesis: *Energy Utilization Futures.* Co-mentor Janet K. Allen.
2. Nathan Preuss. BS CS and Economics Spring 2022. Honors Thesis: *I've Seen the Mountain in My Dreams, And I Shall Seek it 'Til the End.*

[6] 2017 Provost's Outstanding Dissertation Award (Engineering and Science). Honorable Mention.

B.S. students

1. Allana Calvano, working towards a BS in ISE. HERE Scholar in January 2021 and December 2022. Project: *Promote Agriculture 4.0 in India.* Co-mentors Lin Guo (PhD candidate, ISE) and Janet K. Allen, (ISE).
2. Julia Henry, completing a BS in BME. HERE Scholar in Spring 2021. Project: *On Crowd funding for sustainable development in rural India.* Co-mentors Janet K. Allen, (ISE) and Ashok Das (SunMoksha power Pvt. Ltd., India).
3. Dylan Lloyd and Jordan Perkins, working towards BS in ME. HERE Scholars in Spring 2021. Project: *On satisficing in the world of engineering design.* Co-mentors Lin Guo (PhD candidate, ISE) and Janet K. Allen, (ISE).
4. Dylan Portillo, completing a BS in CBME. HERE Scholar in Spring 2021. *Project: On designing a multi-echelon inventory model from a climate change mitigation perspective*. Co-mentors Reza Alizadeh (PhD candidate, ISE) and Janet K. Allen, (ISE).
5. Nathan Preuss, working towards a BS in CS and Economics. HERE Scholar in Spring 2021. *On data curation for fail-safe healthcare networks.* Co-mentors Lin Guo (PhD candidate, ISE) and Janet K. Allen, (ISE). URD First Place Winner in Civil, Electrical, and Industrial Engineering category. Co-author of conference paper.
6. Jacob Starks, working towards a BS in CEES. Independent Research in Fall 2020. Project: *Integrating user preference into improved home appliance scheduling*. Co-mentors Lin Guo (PhD candidate, ISE) and Janet K. Allen, (ISE). Co-author of a conference paper. HRAP Scholar Spring 2021. Project: *On quantifying social drivers for policy recommendations.* URD Second Place winner in Aerospace and Mechanical Engineering Category. Honorable mention AIAA/ASME Symposium. Co-author of conference paper.
7. Jack Edwards, working towards a BS in CS. HERE Scholar in Fall 2019. Project: *Design of green supply chains.* Co-advisors: Reza Alizadeh (PhD candidate, ISE) and Janet K. Allen, (ISE). Grand prize winner URD. Co-author one conference paper and a journal paper under review (2021).
8. Clayborne Harrell, working towards a BS in ISE. HERE Scholar in Spring 2018. Project: *Using Non-dominated Sorting Genetic Algorithm II (NSGA-III) to find Satisficing Solutions for n-Goal Problems.* Lin Guo (PhD candidate, ISE) and Janet K. Allen, (ISE).
9. Ann Broostin, working towards a BS in ME. HERE Scholar in Spring 2017. Project: *On design of multistage manufacturing processes.* Co-advisors: Jelena Milisavljevic (PhD candidate, ME) and Janet K. Allen, (ISE).
10. Megan Harju, working towards a BS in ECE. HERE Scholar in Spring 2017. Project: *On development of indices for sustainable rural development.* Co-advisors: Abhishek Yadav (MS student, ISE) and Janet K. Allen, (ISE).
11. Pranav Mohan, working towards a BS in ME. HERE Scholar in Spring 2017. Project: *On microstructure evolution in hot rod-rolling.* Co-advisors: Anand Nellippallil (PhD candidate, ME) and Janet K. Allen, (ISE). Co-author on two journal and two refereed conference papers. Pursuing PhD at Purdue.
12. Emily Sarbacker, working towards a BS in ISE. HERE Scholar in Spring 2017. Project: *On quantifying student learning in a design, build and test course.* Co-advisors Jackson Autrey (MS student, ME) and Zahed Siddique (ME).
13. Emily A. Vittitow, working towards a BS in ISE. HERE Scholar in Spring 2017. Project: *On development of indices for sustainable rural development.* Co-advisors: Abhishek Yadav (MS student, ISE) and Janet K. Allen, (ISE).
14. Michael Hughes, working towards a BS in ME. HERE Scholar in Spring 2016. Project: *An Ontological Connection Between the Compromise Decision Support Problem and Multistage Manufacturing Processes*. Co-advisor: Janet K. Allen (ISE).
15. Joseph Dal Santo, working towards a BS in ME. Spring 2014 to April 2016. HRAP Scholar in Spring 2016. HERE Scholar in Spring 2014: Project: *Ontology for Selection Decision Support Problem*. Co-author on journal and conference papers.
16. Kevin Song, working towards a BS in ME. Fall 2014 to December 2015. Project: *Inverse Design Method of Hot Rod-Rolling.* Co-author on two journal papers.

17. Adam Dachowicz. Completed BS in ME. HRAP Scholar in Fall 2013. HERE scholar in Spring 2013: *Concurrent Realization and the Gear Manufacturing Process*[7]. Undergraduate research assistant in Fall 2014. End Summer 2015. Co-author on two book chapters and three refereed conference papers. Pursuing PhD at Purdue.
18. Paul Calle, Visiting Scholar, National University of Engineering, Lima, Peru. Started Fall 2014. End of Spring 2015. Project: *Finite Element Analysis of Hot Rolling.*
19. Maryam Sabeghi, Completed BS in ME. Started Fall 2012. Completed in Spring 2013. Project: *Research Plan for NSF Graduate Student Research Fellowship*. Awarded fellowship.
20. Colton Hill, Marli Sussman, HERE Scholars in Spring 2014. Project: *Concurrent Realization and the Gear Manufacturing Process*[1].
21. Alexander Rodriguez Castillo. Visiting Scholar, National University of Engineering, Lima, Peru. Project: *Design of an Electric Charging Station for Hybrid Electric Vehicles.*
22. Casey Carlile, HERE Scholars in Spring 2014. Project: *Design of an Electric Charging Station for Hybrid Electric Vehicles.*

Undergraduate research students. Remote Internships CY 2022

Beijing Institute of Technology, Beijing. Co-supervised with Zhenjun Ming (BIT) and J.K. Allen (ISE)

1. Yanwei Sun. Since June 2020. Undergraduate Industrial Engineering. Outcome: *Assessment of Student Learning through Reflection on Doing using Latent Dirichlet Allocation*. Published in ASME Journal of Mechanical Design, 2022[8].
2. Yifan Zhou. Since August 2020. Undergraduate Computer Science, Beijing Institute of Technology, Beijing. Book Chapter 2023: *A Self-Tutoring System for Managing Student Learning through Reflection*.
3. Mingfei Jiang. Since August 2021. Undergraduate. Outcome: ASME/NSF Travel Grant to attend ASME IDETC 2022 in St. Louis, MO. *From Automation to Intelligence: Self-Organizing Systems.*
4. Yupeng Wu. Since December 2021. Undergraduate Computer Science, Beijing Institute of Technology. Outcome: One journal and one conference paper. Conference paper judged best paper in ASME Design Education Conference, August 2022, St. Louis, MO. *Evaluation of Students' Learning Through Reflection in Doing Based on Sentiment Analysis.* To appear in ASME Journal of Mechanical Design, 2023.
5. Zihan Wang. Since September 2022. Undergraduate Intelligent Manufacturing Engineering, Outcome: *Assessment of Student's Learning Through Reflective Semester Learning Essay Using Sentiment Analysis*. To be submitted to ASME Design Education Conference by March 13, 2023.

High School Students in San Jose California. Co-supervised with Vispi Karkaria (Northwestern) and J.K. Allen (ISE).

6. Anuveer Chadda and Tanaisha Mistry. Since February 2022. Outcome: *Framework for Sustainable Development of a Village by Incorporating Educational and Transportation Policies.* To be submitted to ASME Design Automation Conference by March 13, 2023.

Georgia Institute of Technology, Atlanta, Georgia (1992 to 2009)

Ph.D.

1. Aylin Koca, Faculty of Industrial Design, Technical University of Eindhoven, Eindhoven, the Netherlands. Soft Reliability in New Product Development: An Ontological Approach for Utilizing

7 The Honors College Award for the Best Undergraduate Research, 2013-2014.

8 Invited paper.

Field Feedback to Dynamically Sense and Adapt to Evolving Global Markets. Primary advisor: A. Brombacher. Secondary advisor: F. Mistree. Completed: May 2010.

2. Emad Samadiani. Energy Efficient Thermal Management of Data Centers via Open Multi-scale Design. Co-advisor: Y. Joshi. Started: Fall, 2005. Completed: Fall 2009. Postdoctoral Fellow, Microelectronics and Emerging Technologies Thermal Laboratory (METTL), Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta.
3. Chris Williams. Design and Development of a Layer-Based Additive Manufacturing Process for the Realization of Metal Parts of Designed Mesostructure. Co-advisor: D. Rosen. NSF. NSF TiGER Fellowship 2003-2005. Started Fall 2000. Passed qualifying exams Spring 2002. MS. Fall 2003. Completed Spring 2008. Assistant Professor, Joint Appointment in Mechanical Engineering and Engineering Education, Virginia Tech, Blacksburg, Virginia.
4. Matthew Chamberlain. Decision Support for Strategic Redesign. Co-advisor: J.K. Allen. ONR. Started: Fall 2001. MS Summer 2002. Passed qualifying exams Spring 2003. Completed Fall 2007. Engineer, Dynamic Concepts, Huntsville, Alabama.
5. Nskiken Udoyen. Information Modeling for Intent-Based Characterization of Finite Element Analysis Models. MS (Stanford) 1999. Passed qualifying exam in Fall 2002. Advanced to candidacy Fall 2004. Completed December 2006. Co-advisor D. Rosen. Manufacturing Engineer, Intel, Arizona.
6. Gregory Mocko. A Knowledge Framework for Integrating Multiple Perspectives in Decision-centric Design. MS (2001) Oregon State University, Corvallis. Advised by Robert Fulton from Fall 2001to Spring 2004. Started May 2004. NSF TI:GER Fellowship 2003-2005. Passed qualifying exams Spring 2002. Advanced to candidacy in Fall 2004. Completed 2006. Assistant Professor Clemson University, South Carolina.
7. Haejin Choi. A Robust Design Method for Model and Propagated Uncertainty. Started: Spring 2002. AFOSR. MS Fall 2002. Passed qualifying exams Spring 2002. Advanced to candidacy in May 2004. Completed Fall 2005. Co-Advisor David L. McDowell. Assistant Professor Nanyang Technical University, Singapore.
8. Jitesh Panchal. A Framework for Simulation Based Integrated Design of Multiscale Products and Design Processes. Started Fall 2001. NSF. ONR. AFOSR. MS Spring 2003. Passed qualifying exam in Spring 2003. Advanced to candidacy in May 2004. Fall 2005. Co-Advisor Chris Paredis. Visiting Assistant Professor, Georgia Tech, Savannah. Assistant Professor, Washington State University, Pullman, Washington.
9. Marco Fernández. A Framework for Agile Collaboration in Engineering Design. Co-Advisor: Dr. J.K. Allen. Started Fall 1999. GE Fellowship. NSF Graduate Research Fellowship. NSF Ti:GER Fellowship 2003-2005. MS Fall 2002. Passed qualifying exams Fall 2001. Advanced to candidacy in Fall 2004. Completed 2005. Co-advisor Janet K. Allen. Consultant, Kanbay Consulting (Capgemini Group Company), Atlanta, Georgia.
10. Yao Lin, Design Space Exploration: An Efficient Concept Exploration Method and Sequential Exploratory Experimental Design. NSF. Started: Winter 1998. MS. Fall 2000. Passed qualifying exams Fall 2001. Advanced to candidacy Summer 2002. Completed Fall 2005. United Technologies Research Center, Hartford, Connecticut.
11. Carolyn Conner Seepersad, A Robust Topological Preliminary Design Exploration Method with Materials Applications. Co-advisors: J.K. Allen, D.L. McDowell. NSF Graduate Research Fellowship. Hertz Fellowship. Started: Fall 1998. Passed qualifying exams Spring 2000. MS Spring 2001. Advanced to candidacy Fall 2002. Completed Fall 2005. Assistant Professor, University of Texas, Austin.
12. Angran Xiao, Collaborative Multidisciplinary Decision Making in a Distributed Environment. NSF. Started: Fall 1997. Passed qualifying exams Fall 1998. MS Fall 2000. Advanced to candidacy Fall 1999. Completed Summer 2003. Post-doc. Iowa State University, Ames, Iowa.
13. Gabriel Hernandez, Platform Design for Customizable Products as a Problem of Access in Geometric Space. Started Summer 1998. Passed qualifier Fall 1999. National Council of Science and Technology of Mexico (CONACYT), Lutron Fellow. Completed July 2001. Siemens Westinghouse Power Corporation, Orlando.
14. Mathew Marston, Game-Based Design: A Game Theory Based Approach to Engineering Design. Started: Winter 1997. Passed qualifiers in December 1999. Completed: Summer 2000. NSF Graduate Research Fellow. Idapta Inc., Atlanta.

15. Kjartan Pedersen, Designing Platform Families: An Evolutionary Approach to Developing Engineering Systems. Kvaerner Fellow. Started: Fall 1995. Passed qualifiers in December 1996. Completed: Fall 1999. Kvaerner ASG, Oslo, Norway.
16. Timothy Simpson, A Concept Exploration Method for Product Platform Design. Started: Winter 1996. Completed: September 1998. NSF Graduate Research Fellow. Assistant Professor. Penn State University.
17. Pat Koch, Hierarchical Modeling and Robust Synthesis for the Preliminary Design of Large Scale Complex Systems. Completed: December 1997. Gwaltney Manufacturing Fellow/Allison Engine Company. Engineous Software. Morrisville, NC.
18. Jesse Peplinski, Enterprise Design: Extending Product Design to Include Manufacturing Process Design and Organization Design. Completed: September 1997. NSF Graduate Research Fellow. Raytheon Systems Company, Lewisville, Texas.
19. Kemper Lewis, An Algorithm for Integrated Subsystem Embodiment and System Synthesis. Completed: July 1996. NASA Graduate Student Research Program Fellowship. Assistant Professor. SUNY Buffalo.
20. Wei Chen, A Robust Concept Exploration Method for Configuring Complex Systems. Completed: August 1995. Assistant Professor. Clemson University, Clemson, South Carolina.

M.S.

1. Ayan Sinha. Uncertainty Management in the Design of Multiscale Systems. Started August 2009. NSF EAGER. Completed May 2011. PhD student at Purdue.
2. Timothy Dietz. Conceptual Design of Multi-Domain Systems: Products and Materials. Started Fall 2007. Completed: Spring 2010.
3. Mukul Singhee. A Framework for the Design of Systems with Intelligent and Interactive Information Flow. Started Fall 2008. Completed Fall 2010.
4. Hannah Muchnick. Robust Design of Multilevel Systems Using Design Templates. J.K. Allen co-supervisor. Started Fall 2005.Completed MS May 2007. Co-advisor: J.K. Allen. NSF Graduate Research Fellow. Research Engineer, Duke University.
5. Stephanie Thompsom. Material Selection vs Material Design: A Trade-off Between Design Freedom and Design Simplicity. Started Fall 2005. AFOSR MURI and NSF Graduate Research Fellow. Completed 2007. PhD student at Georgia Tech.
6. Andrew Schnell. Use of Decision-centric Templates in the Design of a Separation Column for a Microscale Gas Chromatography System. GE Fellowship. NSF Graduate Research Fellow. Started Fall 2002. Completed Summer 2006. Co-Advisor P. Hesketh. Research Fellow, USRA, NASA, Huntsville, Alabama.
7. Nathan Rolander. An Approach for the Robust Design of Air-Cooled Data Centers. CEETHERM Consortium Funding. Started Fall 2003. Completed August 2005. Co-advisor: Y. Joshi. Johns Hopkins University, Applied Physics Laboratory.
8. Rakesh Kulkarni, On Infusing Risk and Uncertainty in the Product Platform Constructal Theory Method. Co-advisor: J.K. Allen. NSF. Started: Fall 2003. Completed Fall 2005. Xerox Corporation, Rochester, New York.
9. Christopher Williams, Platform Design for Customizable Products and Processes with Non-Uniform Demand. Started Fall 2000. Completed December 2003. Continued for PhD.
10. Michael Carone, Augmenting the Product Platform Constructal Theory Method for Multiple Objectives. Started Fall 2001. Completed Summer 2003. The Mathworks, Boston, Massachusetts.
11. Jitesh Panchal, Towards a Design Support System for Distributed Product Realization. Started Fall 2001. Completed Spring 2003. Continued for PhD.
12. Matthew Chamberlain, A Step Towards Web-Based Strategic Design. ONR. Rohm & Haas. NSF Graduate Research Fellowship. Started Fall 2000. Completed Fall 2002. Continued for PhD.
13. Marco Fernández, On the Use of Information in Distributed Design. NSF Graduate Research Fellow, GE Fellow. Passed qualifying exams, Fall 2001. MS June 2002. Continued for PhD.
14. Bruce Brown, Computer Assisted Communication of a Systematic Design Method: An Augmentation of Capability. Started Summer 2000. Completed Spring 2002. Distance Learning Student. Northrop Grumman, San Pedro, California.
15. Haejin Choi, A Framework for Distributed Product Realization. GTRI, MARC. Started: Fall 1999. Completed: December 2001. Continued for PhD.

16. Rahul Kulkarni, A Web-Based System for Distribute Product Realization. ONR, NSF. Started Fall 2000. Completed: October 2001. ELP Engineer, National Instruments, Austin, Texas.
17. Carolyn Seepersad, The Utility-Based Compromise Decision Support problem with Applications in product Platform Design. Started: Fall 1998. Completed: June 2001. NSF Graduate Research Fellow. Hertz Fellowship. Continued for PhD. Co-Advisor: J.K. Allen.
18. Jonathan Gerhard, Towards a Decision-Based Distributed Product Realization Environment for Engineering Systems, March 2001. GW Woodruff Fellowship. NSF. Started: Fall 1998. Completed: Spring 2001. Idapta, Inc., Atlanta.
19. Yao Lin, Robust Design Goal Formulations and Metamodeling Techniques. NSF. Started: Winter 1998. Completed: Summer 2000. Continued for PhD.
20. Kiran Krishnapur, Product Platform Concept Exploration of Automobile Engines. NSF. Started: Summer 1998. Completed: Summer 1999. Research Engineer, Performance Friction Corporation, Gastonia, NC.
21. Gabriel Hernandez, A Probabilistic-Based Design Approach with Game Theoretical Representations for Enterprise Design; co-advisor J.K. Allen. Completed: September 1998. Continued for PhD.
22. Greg Mumpower, Improving Product and Process Design Integration through Representation and Simulation of Manufacturing Processes. NSF. Completed: June 1998.
23. Bhardwaj Rangarajan, Robust Concurrent Design of Automobile Engine Lubricated Components. NSF / Ford. Completed: March 1998. Consultant Engineer, I2 Technologies, Irving, Texas.
24. Matthew C. Marston, Sustainability in Process Modeling of Automated Dyebath Reuse. Completed: December 1996. NSF Graduate Research Fellowship. Continued for PhD.
25. Timothy W. Simpson, Development of a Design Process for Realizing Open Engineering Systems. Completed: December 1995. NSF Graduate Research Fellowship. Continued for PhD.
26. Srinivas Vadde, Modeling Multiple Objectives and Multilevel Decisions in Concurrent Design. Completed: August 1995. Siemens, Inc., Atlanta.
27. Tamara Lucas, Formulation and Solution of Hierarchical Decision Support Problems. Completed: June 1995.
28. Jesse Peplinski, Design for Manufacture at the Function Level of Abstraction. Completed: November 1994. NSF Graduate Research Fellowship. Continued for PhD.
29. Patrick N. Koch, Design using Available Assets: A Living Systems Approach. Completed: August 1994. Gwaltney Manufacturing Fellow. Continued for PhD.
30. Arnd Roth, Decision Support Problems in the Pahl/Beitz Design Process. February 1994.
31. Kemper Lewis, The Adaptive Linear Programming Algorithm: Facilitating Robust Design. Completed: February 1994. NASA Graduate Student Research Program Fellowship. Continued for PhD.

Undergraduates Supervised (supported on research grants)

1 Eric Christel. F. Mistree, B. Bras, co-supervisors. Summer 1993. Development of a Computer-Based Designer's Workbook.

2 Kyle Alexander. J.K. Allen co-supervisor. Fall 1993. Development of Computer-based Scheduling of Design Processes.

3 Zahed Siddique. J.K. Allen co-supervisor. Fall 1993. Enhancement of the Preliminary Selection DSP for Mechanical Engineering.

4 Kevin Watley. September 1993 to August 1994. Modeling Design Processes.

5 Douglas Nelson. J.K. Allen principal supervisor. September 1993 to August 1994. Extensions to the Decision Support Problem Technique Workbook.

6 Ron Dailey. J.K. Allen co-supervisor. January 1994 to December 1994. Parametric Studies in Hierarchical Design.

7 David Tibetts. J.K. Allen co-supervisor. Winter 1994. Improving the DSPT Workbook for ME3110.

8 Kristie McAlvin. J.K. Allen co-supervisor. Academic year 94/95. Web-Based Design Education.

9 Richard Hamm. January 1995 to March 1995. Attention Getting Tools for the Design Learning Simulator.

10 Eric Witham. J.K. Allen co-supervisor. January 1995 to March 1995. Creating a Learning Environment Around a Design Simulator.

11 Jason Higgenbotham (CoC). January 1995 to March 1995. Evaluation of Design Learning.
12 Richard Hamm. J.K. Allen co-supervisor. September 1995 to December 1995. Development of Planet Vayu.
13 Saiful Mdramali. Winter 1996. The Role of Information Technology in Design.
14 Amy Herrmann. J.K. Allen co-supervisor. Summer 1997. Decision Support Problems in Design.
15 Valerie Maier-Spredelozzi. J.K. Allen co-supervisor. Fall 1997. Using Information in Design.
16 Jonathan Maier, Summer 1998. Design of Product Platforms.
17 Abiek Musaev (CoC), (J.K. Allen co-supervisor). Spring 1997, September 1997 – December 1998. Implementing A Computer Architecture for Interactive Reflection in Design.
18 David Graham (ECE), (J.K. Allen co-supervisor) Summer 2000. Comparative Examination of Product Platform Extent.
19 Marylin Minus (TFE), Summer 2000 to Spring 2002. Web-Based Design Information.
20 Tim Brown (CoC), Fall 2001. Facilitated Computer-Based Representation of Microworlds.
21 Kyle Cavin, Fall 2003 and Spring 2004. Developing Re-usable Design/Manufacturing Process Flow Diagrams.

Undergraduate Special Problems

1 Ted McCrobie. Winter 1993. A Critical Evaluation of Aircraft Evacuation System Concepts.
2 Eric Christal. Summer 1993. Development of a Computer-Based Designer's Workbook.
3 Zahed Siddique. United Technologies Teaching Intern. Fall 1993. Enhancement of the Preliminary Selection DSP for Mechanical Engineering.
4 Kyle Alexander. Fall 1993. Development of Computer-based Scheduling of Design Processes.
5 Douglas Nelson. Fall 1993. Improving the DSPT Workbook for ME3110.
6 David Tibetts. Winter 1994. Improving the DSPT Workbook for ME3110.
7 Sean Bailey. Fall 1995. Design: A Comparison of Experiences from Two Domains.
8 Saiful Mdramali. Winter 1996. The Role of Information Technology in Design.
9 Dana Melnick Ryan. Spring 1997. Methods of Computer Assisted Creativity in Design.
10 Valerie Maier Speredelozi (with Janet K. Allen). Fall 1997. Organizing Information Utilized by a Rapid Tooling Testbed into a Functional Database.
11 Jonathan Gerhard. Spring 1998. System Configuration Using Available Assets.
12 Kristie Mahone Summer 2001. Literature Review for Materials Design.

Diplom Thesis, Norwegian Technical & Science University, Trondheim, Norway

1 Per Christian Johnsrud, Fall 1994 through Winter 1995. Economic Analysis of Investment Opportunities in the Pulp and Paper Industry: An Investment View.
2 Ovyind Emblem. Winter 1995 through Summer 1996. On Use of TQM in Engineering Practice.

Visiting Research Fellows

1 Aylin Koca. Doctoral candidate, Faculty of Industrial Design, Technical University of Eindhoven, Eindhoven, the Netherlands. July through September 2008. Funded by TU/e. Supervisor: Professor Aarnout Brombacher.
2 Uwe Lautenschlager. Doctoral candidate, University of Siegen. February 1996 through September1997. Funded German Government. Co-supervisor: Professor Hans Eschenauer.
3 Sven Norberg, Response Surface Methodology and Robust Design in Structural Optimization: Design of a Pressure Vessel. Diplom Thesis for University of Siegen. March 1997 through September 1997. Funded German Government. Co-supervisor: Professor Hans Eschenauer.

University of Houston, Houston, Texas (1981-1992)

Ph.D. University of Houston

1 Warren Smith, Modeling and Exploration of Ship Systems in the Early Stages of Decision-Based Design, July 1992. Funded by the Department of Defence (Navy), Canberra, Australia.

2 Bert Bras, Foundations for Designing Decision-Based Design Processes, May 1992. Funded by MARIN: The Netherland's Ship Model Basin, Wageningen, Holland.

3 Saiyid Kamal, The Heuristic Decision Support Problem for Adaptive Design and its use in Lubricant Blending, December 1990. Funded by two grants from the Texas Advanced Technology Program.

4 Eduardo Bascaran, The Development of a Conceptual Model for the Design of Thermal Systems: A Study of Hierarchical Decisions in Designing for Concept, May 1990. Co-advisor R. B. Bannerot. Jointly funded by the UH Energy Laboratory, the Systems Design Laboratory and the Department of Mechanical Engineering, May 1990.

5 Harshavardhan Karandikar, Hierarchical Decision Making for the Integration of Information from Design and Manufacturing Processes in Concurrent Engineering, December 1989.

6 Jon A. Shupe, Decision-Based Design: Taxonomy and Implementation, May 1988.

7 Halil M. Guven, A Comprehensive Method for Computer-aided Design of Practical Energy Systems, May 1984. Co-advisor R. B. Bannerot.

8 Anthony Wu, Strategic Design and Decision Support Methodology for Large-scale, Advanced Technological Systems, July 1983. (Student was supported by NASA Johnson Space Center, Houston).

M.S. University of Houston

1 Bharat Patel, Modeling Multilevel and Multiobjective Decisions in Design; December 1992.

2 Uwe Lautenschlager, Efficient Experimentation for LifeSat Trajectory Simulation using Orthogonal Arrays; August 1992.

3 Wei Chen, Development of Decision Support Problems for Maintenance Management of Gas Turbines, May 1992.

4 Samir Karandikar, Representation and Manipulation of Information in Concurrent Design, May 1992.

5 Srinivas Vadde, Modeling Uncertainty in the Early Stages of Design using Decision Support Problems, May 1992.

6 Ramprasad Krishnamachari, Designing with Fuzzy Compromise Decision Support Problems, August 1991.

7 Thirupathi Bollam, Development of a Design Data-Base for Decision Support Problems for use in a Concurrent Engineering Environment, June 1991. This student got his M.S. in Computer Science and his work was jointly supervised by F. Bastani and F. Mistree.

8 Anil Kumar, Development of an X-Windows Interface to Access a Design Database for Decision Support Problems using an Enhanced-Entity-Relationship Model, December 1990. This student got his M.S. in Computer Science and his work was jointly supervised by R. Elmasri and F. Mistree.

9 Nilanjan Bhattacharya, A Comprehensive Computer-Based Decision Support System for the Preliminary Design of Aircraft Tires, April 1990.

10 Ramesh Srinivasan, Development of a Compromise DSP Template for Understanding Design-Manufacture Interaction in Composite Pressure Vessel Design, May 1989.

11 Qing-jin Zhou, The Compromise Decision Support Problem: A Fuzzy Formulation, May 1988.

12 Sangram Mudali, Dimensional Synthesis of Mechanical Linkages using Compromise Decision Support Problems, October 1987.

13 Saiyid Kamal, Knowledge Representation and Structure for DSIDES - Decision Support in the Design of Engineering Systems, May 1987.

14 Harshavardhan Karandikar, Conditional Post-solution Analysis of Compromise Decision Support Problems, August 1986.

15 Warren Smith, The Development of AUSEVAL: An Automated Ship Evaluation System, December 1985. (Supported by a Fellowship from the Australian Government.)

16 Azim Jivan, A Computer-based Method for Designing Surface Controlled Safety Valve Components, May 1985.

17 Jon A. Shupe, Application of the Decision Support Problem Technique to the Design of Structural Systems, February 1985.

18 Nagesh Kuppuraju, Computer-based Design Synthesis: An Approach to Problem Solving, December 1984. (Supported in part by NL Drilling Systems Technology.)

19 Prawit Ittimakin, Design of Advanced Engineering Systems using Micro-computers, December 1984.

20 Nghia Nguyen, A Computer-based Method for the Design of Horizontal Pressure Vessels, April 1983.

21 Tim Lyon, A Comprehensive Method for the Design of Engineering Systems, February 1983. (Supported by a Fellowship from the Australian Government.)

Undergraduate Honor's Thesis University of Houston

1 Bruce Keckley and Thomas Orsak, The Decision Support Problem Technique Workbook: From the Laboratory to the Classroom, May 1991. Won the Undergraduate Distinguished Thesis Award 1991.

2 Surain Adyanthaya, Partitioning and Planning in the Decision Support Problem Technique, May 1990. Jointly funded by the Texas Advanced Technology Program, Department of Mechanical Engineering and the Systems Design Laboratory.

3 Jack Hong and Guillermo Simovich, Development of the Decision Support Problem Technique Workbook: Clarifications on the Role of Fuzziness, May 1989. Won the Honors Program Alumni Senior Honors Thesis Award, April 28, 1989.

4 David Jackson, A Conceptual Aircraft Design Decision Support Template for Studying Aircraft Performance and Economics, December 1986. (Supported by funds from Contract Number NAS1-188117 from NASA Langley Research Center.)

5 James Vick, Application of the Decision Support Problem Technique to Some Chemical Engineering Problems, December 1986.

6 Stergios Marinopoulos, Design of Aircraft using the Decision Support Problem Technique, August 1986. (Supported by funds from Contract Number NAS1-188117 from NASA Langley Research Center.)

7 Pam Swainson, Automatic Drawing Generation on a Computer-aided Design/Drafting System, 1983. (Project sponsored by ACF Industries, W-K-M Division.)

8 Alan D. Leitko and David Bilberry, The Role of Testing in the Systems Age, 1983. (Project sponsored by NL Drilling Systems Technology.)

9 Jon A. Shupe, Design of Damage Tolerant Offshore Structures, 1982. (Paper part of conference proceedings. Thesis also won an award in the 1982 National Engineering Design Competition.)

University of New South Wales (1976-1980)

M.S.

1 Brian A. Morley, Evaluation of Competing Ship Designs, 1976.

Honour's Thesis

1 Chris G.J. Stafferton, Selection of Fuels for Ships: A Practical Approach using Decision Analysis, 1980.

2 Anthony P. A. Kongats, Designing for Damage Tolerance, 1980.

3 Andrew Cawsey, Interactive Computer Design Packages for Engineering Design, 1979.

4 Timothy Lyon, A Calculator-aided Ship Design Procedure, 1979. (Published in a refereed journal.)

5 David Beresford, Patrol Vessels for Australia's 200-Mile Exclusive Economic Zone, 1978. (Resulted paper that is part of a conference proceedings.)

6 John A. Lee, An Aid to the Selection of Large Marine Propulsion Plants, 1978.

7 Hoo Eng Ong, Ship Design Programs for Electronic Hand-held Calculators, 1978.
8 Diego Trampus, Programmable Calculators in Engineering Design, 1978.
9 Roger H. Turvey, Design Sensitivity Analysis in Engineering Optimization, 1978.
10 Michael R. Warren, Automated Rational Design of Propellers for Fishing Vessels, 1977.

IV PUBLICATIONS

A. Published Books and Parts of Books: Refereed

Research Monographs and Books. *Four since 2018.*

1 Ming, Z., Wang Ru, Nellippallil, A.B, Wang, G., Yan, Y, Allen, J.K. and Mistree, F, 2022, Architecting a Knowledge-Based Platform for Decision Support in the Design of Engineered Systems, Springer Nature. Based on the dissertations of Zhenjun Ming, Anand Balu Nellippallil and Ru Wang. https://link.springer.com/book/10.1007/978-3-030-90521-7

2 Nellippallil, A.B., Allen, J.K, Gautham, BP., Singh, A.K. and Mistree, F., 2020, Integrated Realization of Materials, Products and Manufacturing Processes, Springer Nature. Based on the dissertation of Anand Balu Nellippallil.
https://www.springer.com/us/book/9783030453237

3 Milisavljevic-Syed, J, Allen, J.K., Commuri, S and Mistree, F., 2020, Architecting Networked Engineered Systems: Manufacturing Systems Design for Industry 4.0, Springer Nature.
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4 Rezapour, S., Khosrojerdi, A., Rasoulifar, G., Allen, J.K., Panchal, J.H., Srinivasan, R.S., Tew, J.D. and Mistree, F, 2018, Architecting Fail-Safe Supply Networks, CRC Press. ISBN: 978-1138504264. Based on the dissertations of Shabnam Rezapour and Amirhossein Khosrojerdi.
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6 Shoup, T. E. and Mistree, F., Optimization Methods for the Personal Computer. Englewood Cliffs, New Jersey: Prentice-Hall, (1987).

7 Mistree, F. and Leonardi, E., Program Implementation using KOPE. Sydney, Australia: Unisearch Ltd., (1981).

Chapters in Books. *Three since 2018.*

1 Mistree, F. and Allen, J.K, 2021, "Non-technical Competencies for Succeeding as a Designer in a Digitally Transforming Workplace." In Design for Tomorrow-Volume 2 (Ed. Chakrabarti, A., Poovaiah, R., Bokil, P. and Kant, V.), Springer Link, Singapore, Chapter 20, pp. 243-250. ISBN 978-981-16-0118-7. https://www.youtube.com/watch?v=36LgZaiXTiE

2 Goh, C.H., Dachowicz, A.P., Collins, P.C., Allen J.K. and Mistree, F., 2018, "Predicting Constitutive Equations for Materials Design: A Conceptual Exposition." In Integrated Computational Materials Engineering (ICME) for Metals: Concepts and Case Studies (Ed. M.F. Horstemeyer), John Wiley & Sons, Inc., NJ., Chapter 15.; pp. 515-538. ISBN 978-1-119-01836-0.

3 Goh, C.H., Dachowicz, A.P., Allen J.K. and Mistree, F., 2018, "A Computational Method for the Design of Materials Accounting for the Process-Structure-Property-Performance (PSPP) Relationship." In Integrated Computational Materials Engineering (ICME) for Metals: Concepts and Case Studies (Ed. M.F. Horstemeyer), John Wiley & Sons, Inc., NJ., Chapter 16, pp. 539-574. ISBN 978-1-119-01836-0.

4 Shukla, R., Anapagaddi, R., Singh, A.K., Allen, J.K., Panchal, J.H. and Mistree, F., 2016, "Integrated Computational Materials Engineering for Determining Set Points of Unit Operations for Production of a Steel Product Mix." In Computational Approaches to Materials Design Theoretical and Practical Aspects (Eds. S. Datta and J.P. Davim), Hershey, PA, IGI Publishers, Chapter 6, pp. 163-191.

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8 Panchal, J.H., Choi, H-J., Allen, J.K., Rosen, D., and Mistree, F., 2007, *"*An Adaptive Service-Based Framework for Distributed Product Realization,*"* In Collaborative Product Design and Manufacturing Methodologies and Applications. (W.D. Li, S.K. Ong, A.Y.C. Nee, and C. McMahon, Eds.) Springer Series in Advanced Manufacturing, pp. 1-36.

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11 Williams, C.B., Allen, J.K., Rosen, D.W., and Mistree, F., 2006, "Process Parameter Platform Design to Manage Workstation Capacity," in Product Platform and Product Family Design: Methods and Application*s*. (T. Simpson, Z. Siddique, R. Jiao, Eds.) New York, NY. Springer Press. pp. 421-456.

12 Allen, J.K., Bras, B., Mistree, F., Paredis, C.J.J., Rosen, D., 2005, "Georgia Institute of Technology: The Systems Realization Laboratory," Chapter 26 in Design Process Improvement - A Review of Current Practice, pages 490-493, (Clarkson, P.J. and Eckert, C. Eds.), Springer, New York. ISBN: 1-85233-701-X.

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14 Simpson, T.W., Chen, W., Allen, J.K. and Mistree, F., 1999, "Use of the Robust Concept Exploration Method to Facilitate the Design of a Family of Products," in Simultaneous Engineering: Methodologies and Applications, pages 247-278, (U. Roy, J.M. Usher and H.R. Parsaei, Eds.), New York: Chapman-Hall.

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16 Peplinski, J., Koch, P.N. and Mistree, F., 1998, "Hierarchy and Integration in Organizations and their Products" in Handbook of Technology Management, pages 7.18-7.24, (R.C. Dorf, Ed.), Boca Raton, Florida: CRC Press.

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19 Koch, P. N., Peplinski, J. D., Mistree, F. and Allen, J. K., 1996, "Configuring Systems Using Available Assets: A Conceptual Decision-Based Perspective" in Mechanical Design Theory and Methodology, pages 127-160, (M. Waldron, Ed.), New York: Springer-Verlag.

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B. Refereed Publications. *Journals 35 since 2018. Conference 35 since 2018.*

Editorial for Special Issue

1 Allen, J.K., Commuri, S., Jiao, R., Milisavljevic-Syed, J., Mistree, F., Panchal, J., Schaefer, D., Chen, W., 2021,. "Special Issue: Design Engineering in the Age of Industry 4.0," ASME Journal of Mechanical Design, 143(7), 08800. Impact Factor: 3.251. https://doi.org/10.1115/1.4047348

Refereed Journal Articles

2 Sun, Y., Ming, Z., Ball, Z., Peng, S., Allen, J.K. and Mistree, F., 2022, "Assessment of Student Learning through Reflection on Doing Using the Latent Dirichlet Algorithm," ASME Journal of Mechanical Design, 144(12), 122301. Impact Factor 3.251.

3 Sharma, G., Allen, J. K. and Mistree, F., 2022, "Designing Concurrently and Hierarchically Coupled Systems," Engineering Optimization. 10.1080/0305215X.2022.2098953. Impact Factor 3.23.

4 Guo, L., Milisavljevic-Syed, J., Wang, R., Huang, Y., Allen, J.K. and Mistree, F., 2022, "Managing Many-Goal, Concurrent Design Problems using Adaptive, Leveling-Weighting-Clustering Algorithm," Research in Engineering Design, *34*, 39-60. doi.org/10.1007/s00163-022-00394-z. Impact Factor 2.964.

5 Kamala, V. V. R., Das, A. K., Sharma, A., Allen, J. K. and Mistree, F., 2022, "A Method for Social Entrepreneurs to Develop Sustainable Value Propositions to Address Food, Energy, Water Needs in Communities in Extreme Poverty,"

International Journal of Sustainable Development and Planning, *17*(8), 2347-2356. doi.org/10.18280/ijsdp.170801. Impact Factor 1.8.

6 Preuss, N., Guo, L., Allen, J.K. and Mistree, F., 2022, "Improving Patient Flow in a Primary Care Clinic," Operations Research Forum, *3*, Article Number 45. 10.1007/s43069-022-00152-w.

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10 Guo, L., Chen, S., Allen, J., Mistree, F., 2021, "A Framework for Designing the Customer-Order Decoupling Point to Facilitate Mass Customization," ASME Journal of Mechanical Design, 143(2), 022002, 13 Pages. Impact Factor: 3.251. https://doi.org/10.1115/1.4047684

11 Sharma, G., Allen, J.K., Mistree, F., 2021, "A Method for Robust Design in Coupled Decision Environment," Design Science, *7*, E23. Impact Factor: 3.19 https://**doi**.org/**10.1017/dsj.2021.22**

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17 Invited guest editorial. I have listed it under journals but it may not have the same value as a complete journal article.

18 Invited paper in special commemorative issue to honor Professor Owen F. Hughes and his contributions to the design of ship structures.

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88 Eckford, O.P. and Mistree, F., "Automated Design of Fishing Vessels in Australia?," Proceedings of the Australian Fisheries Exposition, Melbourne, Australia, September 1976, pp. 157-175.

89 Mistree, F., "The Need for Research on Fishing Vessels for Australia," The Australian Symposium on Small Ships, University of New South Wales, Sydney, Australia, November 1975, pp. VII.26-VII.33.

90 Hughes, O.F. and Mistree, F., "Least Cost Optimization of Large Steel Box Girder Structures," Fifth Australasian Conference on the Mechanics of Structures and Materials, Melbourne, Australia, August 1975, pp. 279-299.

91 Hughes, O.F. and Mistree, F., "Some Considerations Regarding Structural Optimization and Finite Element Analysis," 1974 International Conference on Finite Element Methods in Engineering, University of New South Wales, Sydney, Australia, August 1974, pp. 139-159.

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92 Schaefer, D., Thames, J.L., Haroon, S., Panchal, J.H. and Mistree, F., 2011, "Innovative Design Education in a Global Distance Learning setting: Challenges, Opportunities and Experiences," Proceedings Mudd Design Workshop VIII – Design Education: Innovation and Entrepreneurship, Harvey Mudd College, Claremont, California, May 26-28.

93 Schaefer, D., Panchal, J.H., Choi, S.K and F. Mistree, "Strategic Design of Engineering Education for the Flat World," Proceedings, MUDD Design Workshop VI: Design and Engineering Education in a Flat World, Center for Design Education, Department of Engineering, Harvey Mudd College, Claremont, California, USA, May 23-25, 2007, ISBN 978-0-9677049-5-1.

94 Turns, J., Mistree, F. and Allen, J.K "Quantitatively Analyzing the Use and Usefulness of the Design Learning Simulator," American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 163005.

95 Clark, D.D., Mistree, F., Rosen, D.W. and Allen, J.K. "Function-Behavior-Structure: A Model for Decision-Based Design," American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 162501.

96 Turns, J., Newstetter, W., Allen, J.K., and Mistree, F. "The Reflective Learner: Supporting the Writing of Learning Essays That Support the Learning of Design Through Projects." American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 223001.

97 Turns, J., Mistree, F., Rosen, D., Allen, J.K., Guzdial, M. and Carlson, D., "A Collaborative Multimedia Design Learning Simulator," ED-MEDIA 95, World Conference on Educational Multimedia and Hypermedia, (H. Maurer, Ed.), Graz, Austria, June 18-21, 1995, pp. 654-659.

98 Guzdial, M., Vanegas, J., Mistree, F., Rosen, D., Allen, J., Turns, J. and Carlson, D., "Supporting Collaboration and Reflection on Problem Solving in a Project-Based Classroom," ASCE Second Congress on Computing in Civil Engineering, Atlanta, Georgia, pp.334-343, June 1995.

99 Mistree, F., "Decision-Based Design: A Contemporary Paradigm for Education and Research in the Information Age, "Proceedings, Symposium on Science and Engineering Education in the 21st Century, (H.M. Hosney, ed.), The American University in Cairo, April 9-12, pp. 75-81, 1995.[34]

100 Mistree, F., "Design as the Core of an Engineering Curriculum," Proceedings, The Teaching of Marine Design Symposium, Norwegian Technical University, Trondheim, pp. 20-31, May 5, 1993.35

101 Mistree, F., "Recognizing Curricular Goals," Proceedings, The Teaching of Marine Design Symposium, Norwegian Technical University, Trondheim, pp. 32-41, May 4, 1993.[36]

102 Muster, D. and Mistree, F., "Engineering Design as it Moves from an Art to a Science: Its Impact on the Education Process," World Conference on Engineering Education for Advancing Technology, Sydney, Australia, February 13-17, 1989.

103 Muster, D. and Mistree, F., "The Decision Support Problem Technique for Design," 1986 ASEE Annual Conference Proceedings, Cincinnati, June 1986, pp. 117-126.

34 Keynote address.

35 Invited contribution.

36 Invited contribution.

104 Mistree, F. and Muster, D., "Design Education for the 21st Century: Some Issues," Proceedings of the Conference on Educating Design Engineers for the 21st Century, Sydney, Australia, February 5-6, 1986, pp. 10-14.[37]

105 Muster, D. and Mistree, F., "A Curriculum and Paradigms for Design Education in a Computer-intensive Environment," International Conference on Engineering Design Proceedings, Hamburg, West Germany, August 26-29, 1985, pp. 1006-1016.

106 Muster, D. and Mistree, F., "A Curriculum and Paradigms for the Science of Design," 1985 ASEE Annual Conference Proceedings, Atlanta, Georgia, June 1985, pp. 101-107.

107 Muster, D., Weeks, W.H. and Mistree, F., "A Paradigm for Design in the Systems Age," National Conference on University Programs in Computer-Aided Engineering, Design and Manufacturing, Lehigh University, Bethlehem, Pennsylvania, August 8-9, 1984, pp. 153-157.

108 Mistree, F. and Muster, D., "Mechanical Design: An Undergraduate Curriculum for Design in the Systems Age," 1984 ASEE Annual Conference Proceedings, Salt Lake City, Utah, June 1984, pp. 818-826.

109 Mistree, F. and Muster, D., "Design Harmonization in the Systems Age," International Conference on Engineering Design Proceedings, Copenhagen, Denmark, August 15-18, 1983, pp. 305-313.

110 Lyon, T.D., Shupe, J.A. and Mistree, F., "Computer-based Design Synthesis: An Approach to Problem Solving[38]," ASEE Frontiers in Education Conference Proceedings, University of South Carolina, Columbus, South Carolina, October 18-20, 1982, pp. 102-108.

111 Mistree, F., "Computer-based Design Synthesis," 1982 ASEE Annual Conference Proceedings, College Station, Texas, June 1982, pp. 265-272.

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112 McDowell, D.L., Mistree, F. and Allen, J.K, 2007, "Challenges and Prospects for Materials Design," Proceedings TMS Annual Meeting, Materials Processing and Manufacturing Division Symposium: Mechanics and Materials Modeling and Materials Design Methodologies, (Garmestani, H. and Adams B.L., Eds.), pp. 71-80.[39]

113 Allen, J.K., Rosen, D.W., Mistree, F. 2004, "Designing Sustainable Enterprise Systems," The Engineering Systems Symposium, MIT, Cambridge, MA, March 29-31. http://esd.mit.edu/symposium/pdfs/papers/allen.pdf

114 Allen, J.K. and Mistree, F., "Reconceptualizing NSF DMII: A Holistic Approach for the Realization of Complex Products in an Interconnected World," Engineering Design 2030: A Strategic Planning Workshop, Gold Canyon, Arizona, March 26-29, 2004.

115 Mistree, F., "On Rethinking the Foundational Principles of Engineering Design Education," Design Education Workshop, Georgia Institute of Technology, Atlanta. September 8-9, 1997. http://guzdial.cc.gatech.edu/DEW/program.html.

116 Mistree, F., "A Manufacturing Enterprise in 2020: A Future Perspective," Engineering: Shaping the Future, Proceedings 14th Annual National Convention, American Society of Engineers of Indian Origin, Atlanta, August 30-31, 1997, pp. 15-16.

117 Basic Fastener Theory, Construction Dimensions, The Association of the Wall and Ceiling Industries, Vol. 26,. No. 5., Nov. 1997, pp. 17-23. From: http://www.srl.gatech.edu/DLS/

118 Clark, D., Allen, J.K., Mistree, F. and Rosen, D., "Toward a Virtual Design Studio to Foster Learning Through Doing and Collaborating," Proceedings TeamCAD: GVU/NIST Workshop on Collaborative Design, Atlanta, Georgia, May 12-13, 1997, pp. 69-73.

37 Keynote address.

38 Honorable Mention, Education Research Methods Division of ASEE.

39 Invited contribution to honor of Dr. Craig Hartley for his 40 years of Contributions to the Field of Mechanics and Materials Science.

119 Mistree, F., "Teaming: Building a Learning Organization," Integrated Product and Process Development Module 7, National Center for Advanced Technologies, 1997. VIDEO

120 Mistree, F. and Rosen, D., "Product, Process and Enterprise Design," Advanced Manufacturing: Technology and International Competitiveness, Lawrence Livermore Laboratory Report UCRL-ID-120595, Part 3, pp. 9-15, 1995.

National Reports – Contributor. One since 2017

121 Liu, X., Furrer, D. Kosters, J. and Holmes, J., 2018, "Vision 2040: A Roadmap for Integrated, Multiscale Modeling and Simulation of Materials and Systems," NASA/CR-2018-219771. https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20180002010.pdf

122 Integrated Computational Materials Engineering (ICME): Implementing ICME in the Aerospace, Automotive, and Maritime Industries, TMS, 2013 http://d3em.tamu.edu/wp-content/uploads/2016/04/Report-TMS_icme_study_2013PDF.pdf

V PROFESSIONAL PRESENTATIONS

A. Keynotes and Plenaries. *Fourteen since 2018.*

1 *Keynote:* IC4M - International Conference on Advances in Materials, Mechanics, Mechatronics and Manufacturing, Gwalior, India. *A Conversation on Design Engineering 4.0: From Made in India to Design and Make in India.* April 10, 2022

2 *Keynote:* IEEE 5th World Conference on Mechanical Engineering and Intelligent Manufacturing, Anhui University of Technology, Ma'anshan, China. *From Make to Design AND* Make. November 19, 2022.

3 I*naugural Talk:* Indian Institute of Technology, Kharagpur Saturday Manufacturing Talks, Kharagpur, West Bengal, India. *Catapult IIT Kharagpur to be a Research Destination of Choice for Advanced Manufacturing?* March 13, 2021.

4 25th Anniversary Lecture: National Institute of Science & Technology, Palur Hills, Berhampur, Orissa, INDIA. *Let us Celebrate NIST's Silver Jubilee Building on Atmanirbhar Bharat.* May 30, 2021.

5 *Keynote*: Birla Institute of Science and Technology Pillani, Rajasthan, India. International Conference on Best Innovative Teaching Strategies. *When we have Google Why Attend a University.* July 31, 2021. With Janet K. Allen.

6 *Keynote:* Design Education Symposium, Indian Institute of Technology, Guwahati, Assam, India. *Design Education in the Spirit of Antaaya – The Divine Architect. October 8, 2021.* With J.K. Allen.

7 *Inaugural Address Virtual:* Indian Institute of Technology, Center of Excellence for Advanced Manufacturing, Kharagpur, India. *Catapult IIT Kharagpur to be the Destination of Choice for Advanced Manufacturing?* March 13, 2021. https://www.youtube.com/watch?v=tcqfu11YEL8 Starts at 30 minute time stamp.

8 *Opening Address Virtual:* International Systems Realization Partnership Virtual Symposium, *Review the Past, Celebrate the Present to Further Collaboration*. July 11, 2020.

9 *Opening Address Virtual:* IEEE – Humanitarian Technologies Conference. *Setting the Stage for Sustainability 4.0.* October 6, 2020.

10 *Key-note Address:* International Conference on Research into Design, Bangalore, India. *Frontier Issues in Cloud-Based Design and Manufacturing.* January 11, 2019.

11 *Opening Address:* International Systems Realization Partnership Symposium, Beijing, China. *Cloud-Based Platform for Decision Support.* With Zhenjun Ming and Janet K. Allen. July 4. 2019.

12 *Opening Address:* Sustainability Summit, Xavier University of Bhubaneswar, Bhubaneswar, Odisha, India. *Sustainability Disruptions for Mitigating Risks*. February 9, 2018.

13 *Public Lecture:* Xavier University of Bhubaneswar, Bhubaneswar, Odisha, India. *Career Sustaining Competencies for Managing Disruptions in a Digitized World*. February 10, 2018.

14 Plenary: The International Symposium on Platformization of Decision Support in Digital Manufacturing, Beijing Institute of Technology, Beijing, China. *Computational Decision Support When Models are Incomplete and Inaccurate*. June 12, 2018.

15 Opening Keynote and Closing Retrospective: International Symposium on Digital Platforms for Decision Based Design of Complex Engineered Systems. Organized by the International Systems Realization Partnership. Beijing Institute of Technology, Beijing, China. Title of Address: Crafting a Road Map for Digital Platforms for the Decision Based Design of Complex Engineered Systems. June 21 and 23, 2016.

16 *Lead Speaker:* XUB Sustainability Summit -2016: Energy, Peace and Global Governance, Xavier University, Bhubaneswar, Odisha, India. *Engineering Innovation in Sustainable Development,* August 12, 2016.

17 *Opening Key-Note and Closing Retrospective:* IIM-TMS Symposium on ICME for Steel Handshakes for Industrial Adoption, Coimbatore, India. *Framing, Reflections and Way Forward.* November 15, 2015.

18 *Key-Note:* Career Symposium, School of Engineering and Applied Science, Princeton University, Princeton, New Jersey. Title of address: *The Best Job in the World? Being a Professor at a Research University.* April 24, 2015.

19 *Key-Note:* Transdisciplinary Programs Teaching / Learning Workshop, Indian Institute of Technology, Kharagpur, West Bengal, India. *Title of address:* Educating the 21st Century Indian Engineer for a Career in a Wired, Interconnected and Culturally Diverse Engineering. January 4, 2015.

20 *Plenary:* First International Workshop on Software Solutions for Integrated Computational Materials Engineering, Rolduc Abbey / Aachen, Germany. Title of address: *Collaborative Workflow Management in ICME for the Integrated Realization of Materials and Products.* June 27, 2014. With contributions from Jitesh Panchal, Janet K. Allen, B.P. Gautham and Amarendra K. Singh.

21 *Eminent Guest Lecture:* International Seminar on Socio Technical Frontiers of Global Management, Rajarshi School of Management and Technology, Udai Pratap College Campus, Bhojubeer, Varanasi, Uttar Pradesh, India. Title of address: *The Realization of Sustainable Aviation Supply Networks, An Opportunity for the Indian Aviation Industry in a Changing Globalized Management Sector*. April 4, 2014.
URL: https://www.youtube.com/watch?v=Rvm98p0odT4

22 *Opening Keynote* and *Closing Retrospective:* International Workshop on Best Practices for Integrating Mining and Biodiversity Conservation, India Habitat Center, New Delhi, India. Organized by the International Union for the Conservation of Nature. Title of Address: *Crafting a Road Map for Mainstreaming Biodiversity in the Mining Sector.* March 19 and 20, 2014.

23 *Opening Keynote:* Meta Design Workshop, Tata Consultancy Services, Pune, India. Title of address: *Meta Design: Reconfigurable Design Chains.* March 12, 2013.

24 *Opening Keynote:* TACTICS Satellite Symposium: Nurturing Innovation, Tata Research, Development and Design Center, Pune, India. Title of address**:** *The Realization of Complex Systems: Managing Dilemmas.* January 3, 2013.

25 International Conference on Agile Manufacturing, IIT Banaras Hindu University, Banaras, India. Title of address**:** *Strategic Systems Engineering: Educating the 21st Century Indian Engineer.* December 16, 2012.

26 2012 Poultry Science Association Annual Meeting, The Georgia Center, Athens, Georgia. Transformational Innovation for a Viable Future: Title of address: *A 21st Century Coop Program.* July 12, 2012.

27 IIT Conclave: Technology and Development in Gujarat, Vibrant Gujarat Summit, Ahmedabad, Gujarat, India. Title of address: *21st Century Economic Leadership in a Wired and Interconnected World*. January 11, 2011. Co-speaker: Sammy Haroon.
Part 1: http://www.youtube.com/watch?v=5V8qUVJIeHo
Part 2: http://www.youtube.com/watch?v=ErtPouZGPcs
Part 3: http://www.youtube.com/watch?v=gtLgkPYrZqY
Q&A: http://www.youtube.com/watch?v=Ggtf0O1ULKA&list=UUojThAH14A8YBPa-RlBy-mg&index=9&feature=plpp_video

28 OPEN Houston's Annual Conference: Future of Healthcare and Energy Sectors, Houston, Texas. Title of address: *Invention2Innovation*. May 8, 2010.

29 Global Leaders Share the Path for Pakistan, Riphah International University and The Indus Entrepreneurs, Islamabad, Pakistan. Title of address: *Invention2Innovation – A Roadmap for an Innovation Culture.* February 13, 2010.

30 Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia. Visioning Engineering 2020: Title of address: *Exploring the New Normal for the Post-Recession, Culturally Diverse, Interconnected World.* October 9, 2009.

31 2009 Virtual Product Development Conference, Bangalore, India. Title of address: *Strategic Engineering: Simulation-enabled, Distributed, Collaborative Realization of Complex Systems*. May 26, 2009.

32 International Conference on Advances in Materials and Materials Processing, Indian Institute of Technology, Kharagpur, India. Title of address: *Robust Multiscale Simulation-Based Design of Multifunctional Materials.* February 3, 2006[40].

33 Innovation Oriented Research Programs, Rapid Product Development Symposium, Brussum, The Netherlands. *Strategic Design – A Contemporary Paradigm for the Near Tomorrow.* September 13, 2005.

34 Engineering Design Conference 2002, King's College, UK, July 9, 2002: Title of address: *Strategic Design – Leveraging and Innovation for a Changing Market Place.*

35 Engineering Design Conference 2000, Brunell University, UK, June 27, 2000: Title of address: *Designing for Excellence – A Game-Theoretic, Microworld Approach.*

36 First Gordon Research Conference on Theoretical Foundations for Product Design and Manufacturability, New England College, Heneken, New England, June 7, 1998: Title of address: *Status and Opportunities in Decision-Based Design.*

37 Symposium on Sciences and Engineering Education in the 21st Century, The American University on Cairo, Cairo, Egypt, April 13, 1995. Title of address: *Decision-Based Design - A Contemporary Paradigm for Research and Education in the Information Age.*

38 Fourth International Marine Systems Design Conference (IMSDC'91), Kobe, Japan, May 27 1991. Title of address: *Designing Decisions: Axioms, Models and Marine Applications.*

39 Terotechnology Workshop, Danish Technical University, Lyngby, Denmark, May 18, 1988. Title of address: *Systematic Maintenance using the Decision Support Problem Technique.*

40 Conference on Educating Design Engineers for the 21st Century, Sydney, Australia, February 3-6, 1986. Title of address: *Design Education for the 21st Century: Some Issues*.

41 CAD/CAM, Robotics and Automation International Conference, Tucson, Arizona, February 15, 1985. Title of address: *An Algorithm for Solving Multiple Objective Problems in Engineering Design.*

B Professional Seminars. *Thirty-eight since 2018.*

1. *Webinar:* Systems Realization Laboratory, University of Liverpool, Liverpool, UK. *Optimum Design of Complex Systems is an Oxymoron?* March 23, 2022. With J.K. Allen.
2. *Webinar:.* ASME Journal of Mechanical Engineering Webinar. *Design Engineering in the Age of Industry 4.0.* May 10, 2022. With J.K. Allen, S, Commuri, R. Jiao, J. Milisavljevic-Syed, J. Panchal, D. Schaefer.
3. Webinar: North American Mobed's Council, Toronto, Canada. *Zoroastrian Parenting in North America.* May 22, 2022. With J.K. Allen
4. *Webinar:* IIT Kharagpur Alumni, Bay Area Chapter, California, USA. *Atmanirbhar Bharat 2047: On Moving IIT Kharagpur Up in the World Rankings.* May 27, 2022.
5. *Webinar:* Indian National Academy of Engineering, Bhubaneswar Chapter, Odisha, India. *Atmanirbhar Bharat 2047: On Moving Indian Higher Education Institutions up in the World Rankings.* June 17, 2022.
6. *Panel:* World Zoroastrian Congress, New York, USA. *Making the Impossible Possible: Enhancing Global Zoroastrian Excellence Through Entrepreneurship.* July 3, 2022.
7. *Webinar:* Rekhi Center of Excellence for the Science of Happiness, Indian Institute of Technology, Kharagpur, West Bengal, India. *Defining the Identity of the Rekhi Centers: A Conversation on Curriculum and Course Development.* July 13, 2022.
8. *Webinar:* International Systems Realization Partnership. Virtual. *Design Engineering in the Age of Industry 4.0.* July 18, 2022.
9. Webinar: Boston Pledge, Boston, USA. *Unleashing the Power of Human Capital.* August 14, 2022. With D. Acharya.

[40] One of three keynote addresses.

10. *Webinar*. North American Mobed's Council, Toronto, Canada. *Zoroastrianism and UN's 17 Sustainable Development Goals.* December 10, 2022. With K.P. Mistree and K. Koka.
11. *Webinar:* Stevenson School of Biomedical Engineering, University of Oklahoma, Norman, Oklahoma, USA. *The Best Job in the World? Becoming a Professor at a Research University.* January 8, 2021. With J.K. Allen.
12. *Webinar:* Freedom Employment Agency, Delhi, India. *From Self-Regulation to Goal Setting.* February 19, 2021.
13. *Webinar:* University of Liverpool, Systems Realization Laboratory, Liverpool, UK. *Optimum Design: An Oxymoron in Reality?* March 3, 2021. With J.K. Allen.
14. *Webinar:* Noble Engineering College, Junagadh, Gujarat, India. *Atmanirbhar Bharat: Beyond Industry 4.0 to Design Engineering 4.0.* May 15, 2022
15. *Webinar:* JK Lakshmipat University, Jaipur, Rajasthan, India. *Frontier Issues in Cloud-Based Design and Manufacturing.* June 2, 2021.
16. *Webinar:* International Multidisciplinary Webinar Series, Sankalchand Patel University. *Collaborative Interdisciplinary Research: Smart Spaces for Cyber-Physical-Social Systems.* July 22, 2021. With J.K. Allen.
17. *Webinar:* Parliament of World Religions, Chicago, Illinois, USA. *Zoroastrianism and Sustainable Development.* September 26, 2021. With K. P. Mistree.
18. *Webinar*: University of Utah, Provo, Utah, USA. *Systems Engineering: A Research View from the University.* December 1, 2021. With J.K. Allen.
19. *Seminar Virtual.* University of Liverpool, Liverpool, UK, *Optimum Design: An Oxymoron in Reality?* March 3, 2021. With J.K. Allen.
20. *Seminar Virtual:* JK Lakshimat University, Jaipur 302026, Rajasthan, India. *SunMoksha and Sustainable Innovation: Empowering Lives, Catalyzing Development.* February 8, 2020. With Ashok K. Das.
21. *Seminar Virtual:* IEEE – Webinar on Human Technologies, Bengaluru, India. *Competencies for Sustainable Development in the 21st Century.* April 17, 2020. .
22. *Seminar Virtual:* World Zoroastrian Chamber of Commerce. *Effective Remote Learning – Managing Stress and Time.* September 19, 2020.
23. *Seminar Virtual:* Freedom Employment Academy, Delhi, India. *Effective Remote Learning – Managing Stress and Time.* October 17, 2020.
24. *Seminar:* Tata Consultancy Services, Bengaluru, India. *Frontier Issues in Cloud-Based Design and Manufacturing.* January 11.2019.
25. *Seminar:* Graduate College, University of Oklahoma. *Academic Job Placement Support.* With Janet. K. Allen. April 19, 2019.
26. *Seminar:* Graduate School of Beijing Institute of Technology, Beijing, China. *Frontier Issues for Succeeding in a Digitized World.* June 11, 2019.
27. *Seminar:* Indian Institute of Technology, Kharagpur, India. *Frontier Issues in Cloud-Based Design and Manufacturing.* August 7, 2019.
28. *Seminar:* Indian Institute of Technology, Kharagpur, India. *Frontier Issues for Succeeding in a Digitized World.* August 8, 2019.
29. *Seminar:* Online Metal Conference. *A Set Based Approach for the Integrated Exploration of Solution Space of Ladle, Tundish and Caster.* November 22, 2019.
30. *Panel:* Broadening Participation of Underrepresented Groups in ASME DED, Anaheim, California. *Mentoring to Educate the Next Generation Academic.* August 18, 2019.
31. *IEEE Seminar:* Indian Institute of Technology, Kharagpur, West Bengal, India. *Frontier Issues for Succeeding in a Digitized World.* August 8, 2019.
32. *IEEE Seminar:* Indian Institute of Technology, Kharagpur, West Bengal, India. *Issues in Cloud-Based Design and Manufacturing.* August 7, 2019.
33. *Seminar:* National Institute for Science and Technology, Berhampur, Odisha, India. *Applying to Graduate School in the US.* February 12, 2018.

34. *Seminar:* Xavier University of Bhubaneswar, Bhubaneswar, Odisha, India. *Social Entrepreneurship for Sustainable Development: Creating Value Propositions for Sustainable Development.* February 14, 2018.
35. *Webinar:* Zoroastrian Faculty Network, India. *Applying to Graduate School in the US.* May 4, 2018. With Janet K. Allen.
36. *Seminar:* Graduate School of Beijing Institute of Technology, Beijing, China. *Frontier Issues for Succeeding in a Digitized World.* June 11, 2018.
37. *Seminar:* Society of Petroleum Engineers Student Section, Mewbourne College of Engineering, University of Oklahoma, Norman, Oklahoma. *Identifying Research Gaps, Formulating Hypotheses and Proposing a Research Plan.* October 10, 2018. With Janet K. Allen
38. *Seminar:* The AME Graduate Student Community Seminar Series, AME, University of Oklahoma, Norman, Oklahoma. *Frontier Issues in Cloud-Based Design and Manufacturing.* October 11, 2018.
39. *Invited Speaker:* Leadership Meeting, The Shivaji Group of Institutions, Vashi, Maharashtra, India. *Being a Professor is the Best Job in the World – A Call to Action.* September 19, 2017. Via YouTube. https://www.youtube.com/watch?v=q00lTBWF6uw
40. *Invited Talk:* Academic Leadership Workshop[41], Hilton America, Houston, Texas, October 21, 2017. *Time Management when Work is Part of Life*.
41. *Seminar:* Center for Smart Grid Technologies, New Mexico State University, Las Cruces, New Mexico, October 13, 2017. *Industry 4.0, Digital Threads, Digital Twins and Cyber Physical Systems.* With J.K. Allen.
42. *Seminar:* ASME Central Oklahoma Section, Oklahoma State University @ OKC, Oklahoma City, Oklahoma. *Designing When All Simulations Are Wrong and Only Some are Useful.* December 8, 2016. With J.K. Allen.
43. *Invited Talk:* ASME Design Engineering Conference, IDETC/CIE Charlotte, North Carolina. *Being a Professor is the Best Job in the World.* August 23, 2016. With J.K. Allen.
44. *Seminar:* Institute for Technical Education and Research, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha, India. *Learning Through Reflecting on Doing.* June 1, 2016. With J.K. Allen.
45. *Seminar:* Tata Consultancy Services, Pune, India. *Decision Support in ICME.* March 16, 2016. With J.K. Allen.
46. *Seminar:* Tata Consultancy Services, Pune, India. *Identifying Research Questions using the Dilemma Triangle.* March 15, 2016.
47. *Seminar:* Center for Advanced Vehicular Systems, Mississippi State University, Starkville, Mississippi. *Engineering Complex Systems When All Simulations are Wrong and Only Some are Useful.* February 22, 2016.
48. *Seminar:* Department of Mechanical Engineering, Beijing Institute of Technology, Beijing, China. *The Decision Support Problem Technique ad a Framework for the Realization of Complex Systems.* November 23, 2015. With J.K. Allen.
49. *Seminar:* Department of Mechanical Engineering, Beijing Institute of Technology, Beijing, China. *Applying to Graduate School in the US.* With J.K. Allen. November 23, 2015.
50. *Seminar:* Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur, West Bengal, India. *Integrated Computational Materials Engineering (ICME) When all Simulations are Wrong and Only Some are Useful.* November 18, 2015.
51. *Invited Talk:* Decision Engineering From Engineering Phenomena to Value, National Science Foundation, Arlington, Virginia. *Decision Support When All Simulations are Wrong and Only Some are Useful.* October 30, 2015.

[41] Organized by the Department of Industrial Engineering, University of Houston, Houston, Texas as a prelude to 2017 INFORMS

52. *Distinguished Lecture:* Baker Hughes International, 2001Rankine Road, Houston, Texas. *All Simulations are Wrong Only Some are Useful.* July 28, 2015.
53. *Seminar:* Vinod Gupta School of Management, Indian Institute of Technology, Kharagpur, West Bengal, India. *Identifying and Developing Competencies through an Authentic Immersive Experience Anchored in Sustainable Development.* March 19, 2015.
54. *Seminar:* Department of Mechanical Engineering, Texas A&M, Education City, Qatar. *Simulation Based Design of Complex Systems: Research Opportunities.* March 25, 2016.
55. *Seminar:* Department of Mechanical Engineering, Texas A&M, Education City, Qatar. *Educating the 21st Century Design Engineer.* March 26, 2016.
56. *Seminar:* Institute for Technical Education and Research, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha, India. *Education in the 21st Century: Opportunities and Challenges.* January 7, 2015. With J.K. Allen.
57. *Institute Lecture:* Indian Institute of Technology, Kharagpur, India, with Janet K. Allen. T*he Best Job in the World: Being a Professor in a Research University.* June 10, 2014. Outcome: The 200 person auditorium was completely filled and many people sat on the floor.
58. *Seminar:* Mechanical Engineering Department, The University of Texas, Austin. *The Realization of Complex Systems.* April 4, 2014.
59. *Seminar:* Don Bosco Technical Institute, Kurla, Mumbai, India. *Identifying and Developing Competencies for the 21st Century Indian Engineer.* January 2, 2014.
60. *Seminar:* National Institutes of Standards and Technology, Gaithersburg, Maryland. *The Integrated Realization of Materials and Products.* August 13, 2013. With J.K. Allen.
61. *Seminar:* Siksha 'O' Anusandhan University, Bhubaneswar, India. *Preparing for ABET Accreditation: Personal Observations.* June 4, 2013.
62. *Seminar:* Vel Tech Technical University, College of Engineering, Chennai, India. *Preparing for ABET Accreditation: Personal Observations.* June 6, 2013.
63. *Seminar:* Emerging Technology and STEM Education Symposium, University of Oklahoma, Norman, Oklahoma. *Developing Competencies for the 21st Century Engineer.* May 6, 2013. With Zahed Siddique.
64. *Seminar:* SSN College of Engineering, Department of Chemical Engineering, Chennai, India. *Educating the 21st Century Indian Engineer for a Career in a Wired, Interconnected and Culturally Diverse Engineering World.* March 14, 2013.
65. *Seminar:* Baker Hughes International, Woodlands, Texas. *The Integrated Design of Engineered Materials and Products.* January 22, 2013.
66. *Seminar:* Indian Institute of Technology Madras, Chennai, India. *Managing Uncertainty in the Realization of Complex Systems.* January 8, 2013.
67. *Seminar:* Indian Institute of Technology Madras, Chennai, India. *The Realization of Complex Systems: Managing Dilemmas.* January 7, 2013.
68. *Seminar:* Big Ideas Seminar Series, School of Aerospace and Mechanical Engineering, University of Oklahoma, Norman, Oklahoma. *Managing Uncertainty in the Realization of Complex Systems.* September 4, 2012. With J.K. Allen
69. *Seminar:* College of Engineering, Pune, India. *THE Best Job in the World? Being a Professor in a Wired, Interconnected and Culturally Diverse World.* August 31, 2012. Via Skype.
70. *Seminar:* Tata Consultancy Services, Pune, India. *Educating the 21st Century Indian Engineer for a Career in a Wired, Interconnected and Culturally Diverse Engineering World.* June 1, 2012.
71. *Seminar:* Tata Consultancy Services, Pune, India. *Decision Support Problems in Robust Design.* March 17, 2012. With Janet K. Allen.
72. *Seminar:* Tata Consultancy Services, Pune, India. *Improving the Process of Strategic Design.* March 13, 2012. With Janet K. Allen.
73. *Seminar:* Government of Gujarat, Industries Commissionerate, Gandhinagar, Gujarat, India. *Supportability Engineering for Complex Engineered Systems.* December 19, 2011.

74. *Seminar:* Department of Mechanical Engineering, Texas Tech University, Lubbock, Texas. *Strategic Systems Engineering.* October 31, 2011.
75. *Seminar:* CISCO, Executive Briefing Center, San Jose, California. *Developing Talent for the Innovation Economy.* July 7, 2011.
76. *Seminar:* School of Electrical and Computer Engineering, University of Oklahoma, Tulsa. *21st Century Economic Leadership in a Wired and Interconnected World.* March 22, 2011.
77. *Seminar:* The Channing Universalist Unitarian Church, Edmond, Oklahoma. *Value Creation in an Interconnected, Culturally Diverse World.* February 27, 2011
78. *Seminar:* Gujarat Technological University, Ahmedabad, Gujarat, India. *Sustainability and the Net Zero Energy / Eco Footprint Initiative.* January 7, 2011.
79. *Seminar:* Chief of Naval Operations Strategic Studies Group, Newport, Rhode Island. *Strategic Engineering: The Realization and Sustainment of Systems of Systems.* November 22, 2010.
80. *Seminar:* Freudenberg Dichtungs und Schwingungstechnik GMBH, Innovation Center, Weinheim, Germany. *Innovation for the Post-Recession Economy: Energy – Entrepreneurship – Environment,* August 6, 2010.
81. *Seminar:* Department of Mechanical and Aerospace Engineering, University of Texas, Arlington. *Strategic Engineering: Preparing for the Post-Recession Innovation Economy.* May 28, 2010.
82. *Seminar:* AIAA/ASME Symposium, Oklahoma State University, Stillwater. *Preparing for the Post-Recession (Innovation) Economy.* April 10, 2010.
83. *Seminar:* School of Aerospace and Mechanical Engineering, University of Oklahoma, Norman. *Preparing for the Post-Recession Innovation Economy.* January 27, 2010.
84. *Seminar:* School of Computer Science, University of Oklahoma, Norman. *Exploring Academic "White Space" in the Post-Recession (Innovation) Economy.* December 4, 2009.
85. *Seminar:* School of Electrical and Computer Engineering, University of Oklahoma, Tulsa. *Exploring the New Normal: Educating Engineers to Create Value in an Interconnected World.* October 27, 2009.
86. *Seminar:* ASME Central Oklahoma Section, Oklahoma City. *Exploring the New Normal for the Post-Recession (Innovation) Economy.* October 22, 2009.
87. *Seminar:* School of Aerospace and Mechanical Engineering, University of Oklahoma, Norman. *AME and the World of 2020.* May 5, 2009.
88. *Seminar:* School of Aerospace and Mechanical Engineering, University of Oklahoma, Norman. *Simulation-Based Design of Complex Multilevel Systems.* September 24, 2009.
89. *Seminar:* Vel Tech Technical University, Chennai, India. *On Scholarship and Scholarly Papers.* June 30, 2009.
90. *Seminar:* Vel Tech Technical University, Chennai, India. *Research Opportunities and Research Questions.* June 29, 2010.
91. *Seminar:* Institute Seminar. Indian Institute of Technology, Kharagpur, India. *Being a Professor is the Best Job in the World.* June 23, 2009.
92. *Seminar:* National Institute for Science and Technology, Bhubaneswar, India. *Listening and Learning from Each Other: Opportunities and Challenges facing Technical Education in India.* June 21, 2009.
93. *Seminar:* Infosys Technologies Ltd., Bangalore, India. *A Global Partnership for Creating Value Via IT-Enabled Strategic Engineering.* May 27, 2009.
94. *Seminar:* Erik Jonsson School of Engineering, University of Texas at Dallas, Richardson, Texas. Distinguished Lecture. *Strategic Engineering - Educating Engineers to Create Value in an Interconnected World.* December 16, 2008.
95. *Seminar:* Department of Industrial and Systems Engineering, Texas A&M University, College Station, Texas. *Strategic Engineering - Educating Engineers to Create Value in an Interconnected World.* November 10, 2008.

96. *Seminar:* School of Mechanical Engineering, Purdue University, West Lafayette, Indiana. *Strategic Engineering - Educating Engineers to Create Value in an Interconnected World.* November 3, 2008.
97. *Seminar:* MSC Software, Inc., Santa Ana, California. *A Global Partnership for Creating Value Via IT-Enabled Strategic Engineering.* July 23, 2008.
98. *Seminar:* SAVE International, Reno, Nevada. *Discovering 'Value Added' Strategy: Strategic Engineering – Value Creation for the Global Marketplace.* June 11, 2008.
99. *Seminar:* MSC Software, Inc., Ann Arbor Michigan. *A Global Partnership for Creating Value Via IT-Enabled Strategic Engineering.* March 10, 2008.
100. *Seminar:* Armstrong Atlantic State University, Savannah, Georgia. Hudson Colloquium Speaker. *Strategic Engineering – Value Creation in a Global Marketplace.* February 6, 2008.
101. *Seminar:* Hewlett Packard Company, TCD Workstation Division, Fort Collins, Colorado. *Strategic Engineering – Value Creation in a Global Marketplace.* February 1, 2008.
102. *Seminar:* Iowa State University, Department of Mechanical Engineering, Ames, Iowa. *Simulation-based Design of Complex Multilevel Systems.* October 30, 2007.
103. *Seminar:* ACARA Global, Inc., Cincinnati. *Strategic Engineering – A Response to Globalization.* October 23, 2007.
104. *Seminar:* BMW, Munich, Germany. *Strategic Engineering – A Response to Globalization.* July 10, 2007.
105. *Seminar:* TU/e and Eindhoven Economic Region, Technical University of Eindhoven, Eindhoven, the Netherlands. *Strategic Engineering – A Response to Globalization.* May 12, 2007.
106. *Seminar:* Indian Institute of Technology, Kharagpur, India. *Strategic Engineering – A Response to Globalization.* March 22, 2007.
107. *Seminar:* National Institutes of Technology, Bhubaneshwar, Orissa, India. *Strategic Planning for Technological Education in Orissa.* March 21, 2007.
108. *Seminar:* National Institute for Science and Technology, Palur Hills, Berhampur, Orissa, India. *Strategic Education – A Contemporary Paradigm for the Near Tomorrow.* March 17, 2007.
109. *Seminar:* University of Missouri – Rolla, Department of Mechanical Engineering, Rolla, Missouri. *Simulation-based Design of Complex Multilevel Systems.* February 27, 2007
110. *Seminar:* IEEE Technical Training Conference, National Engineer's Week, Savannah, Georgia. *Strategic Engineering – A Response to Globalization.* February 22, 2007.
111. *Seminar:* Armstrong Atlantic State University, Savannah, Georgia. *Strategic Engineering – A Response to Globalization.* February 14, 2007.
112. *Seminar:* Proctor and Gamble R & D Center, Cincinnati, Ohio. *Strategic Engineering – A Response to Globalization.* January 24, 2007.
113. *Seminar:* IEEE Savannah Chapter, Savannah, Georgia. *Strategic Engineering – A Response to Globalization.* November 9, 2006.
114. *Seminar:* Faculty of Industrial Design, Technical University of Eindhoven, Eindhoven, the Netherlands. *Creating a Product Creation Network – Attaining the Vision.* October 25, 2006.
115. *Seminar:* Department of Mechanical Engineering, Indian Institute of Technology, Mumbai, India. *Designing Multifunctional Materials, Processes and Products.* October 19, 2006.
116. *Seminar:* Indian Institute of Technology, Kharagpur, India. Kshitij 2006. *Strategic Education ... A Contemporary Paradigm for the Near Tomorrow.* February 5, 2006.
117. Bengal Engineering College, Kolkata, India. *Strategic Planning of Technological Education Seminar: ... Innovation Has No Boundaries.* February 5, 2006.
118. *Seminar:* Department of Mechanical Engineering, Northwestern University, Evanston, Illinois. *Designing Multi-functional Materials, Products and Processes.* November 18, 2005.

119. *Seminar:* Faculty of Technology Management, Technical University of Eindhoven, Eindhoven, The Netherlands. *Modeling Simulation-Based Design Processes via Reusable Decision Centric Templates: 3-P Information Model for Simulation-Based Multiscale Design Processes.* September 14, 2005.
120. *Seminar:* United Technologies Research Center, East Hartford, Connecticut. *An Interactive, Distributed, Computational Environment for the Design of Multifunctional Materials, Products and Processes.* July 8, 2005.
121. *Seminar:* Virginia Tech, Department of Engineering Science and Mechanics, Blacksburg, Virginia. *An Interactive, Distributed, Computational Environment for the Design of Materials, Products and Design Processes.* March 30, 2005.
122. *Seminar:* General Electric – Wind Energy Technology, Greenville, South Carolina. *An Interactive, Distributed, Computational Environment for the Design of Materials, Products and Design Processes.* March 28, 2005.
123. *Seminar:* Manufacturing the Future – Showcasing Innovative Manufacturing Research, Manchester, UK. *Innovative Manufacturing Research in a World Context.* September 14, 2004[42].
124. *Seminar:* Georgia Tech – Savannah. GT Savannah – *Making Our Dreams Come True.* September 9, 2004.
125. *Seminar:* SimTech, Singapore. *Information and Knowledge Management in PLM – Research Opportunities.* August 11. 2004
126. *Seminar:* AFOSR Metallic Materials Grantees Meeting, Charlottesville, Virginia. *An Interactive Collaboration Environment for Grantees in the AFOSR Metallic Materials Program.* August 16, 2004[43].
127. *Seminar:* ARO/GATECH Workshop on Inverse Techniques in Materials Design, Atlanta, Georgia. April 27, 2004[44]. *Are we Designing Materials?*
128. *Seminar:* Design Technology Institute, National University of Singapore, Singapore, March 11, 2004. *Strategic Design: A Contemporary Paradigm for Our Worlds of Tomorrow.*
129. *Seminar:* Design Technology Institute, National University of Singapore, Singapore, March 10, 2004. *Concurrent Design of Product, Materials and Manufacturing Processes in a Distributed Environment.*
130. *Seminar:* Design Technology Institute, National University of Singapore, Singapore, March 9, 2004. *Product Life Cycle Management: Status and Opportunities*.
131. *Seminar:* Reyerson University, Toronto, Canada, October 15, 2003: *Strategic Design - Leveraging and Innovating for a Changing Marketspace.* Sponsored by Materials and Manufacturing Ontario.
132. *Seminar:* National Research Council, London, Ontario, Canada, October 14, 2003: *An Interactive, Distributed, Computational Environment for the Design of Multi-Functional Materials and Processes.*
133. *Seminar:* Workshop on The Future of Product Development, Institute for Manufacturing, Cambridge, UK, October 1, 2003: *Strategic Design - A Contemporary Paradigm for Our Worlds of Tomorrow*
134. *Seminar:* Boulder, Colorado, August 7, 2003 (with D.L. McDowell): *An Interactive, Distributed, Computational Environment for the Design of Multi-Functional Materials and Processes.*
135. *Seminar:* Northeastern University, Department of Mechanical Engineering, Boston, May 9, 2003: *An Interactive, Distributed, Computational Environment for the Design of Multi-Functional Materials and Processes.*

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42 Invited keynote address.

43 Invited luncheon speaker with David McDowell and Janet K. Allen.

44 Invited plenary talk.

136. *Seminar:* Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia, May 1, 2003 (with D.L. McDowell): *An Interactive, Distributed, Computational Environment for the Design of Multi-Functional Materials and Processes*.
137. *Seminar:* Philips R&D, Eindhoven, the Netherlands, April 16, 2003: *Information Technology for the Integration of Manufacturing Enterprise Systems – Potential and Challenges*.
138. *Seminar:* GT McIver Seminar, Schools of Public Policy and Civil Engineering, February 20, 2003: *Strategic Design – Leveraging and Innovating for a Changing Marketplace.*
139. *Seminar:* SimTech's Product Design and Development Forum, Singapore, February 11, 2003: *Strategic Design – Leveraging and Innovation for a Changing Marketplace*.
140. *Seminar:* National University of Singapore, Design Technology Institute, Singapore, February 10, 2003: *Simulation Based Design of Specialty Materials – Potential and Challenges.*
141. *Seminar:* 2002 Zeigler Lecture, G.W. Woodruff School of Mechanical Engineering, Atlanta, March 27, 2002: *Cinderella, Professors, Change and the Wal-Marting of American Higher Education.*
142. *Seminar:* GINTIC Forum, Singapore, September 26, 2001: *Towards Systems Realization in 2020*.
143. *Seminar:* Lutron Electronics, Inc., Coopersburg, Pennsylvania, November 27, 2000: *Mass Customization, Flexibility, Scalability and Commonality*.
144. *Seminar:* Lucent Technologies, Carter Road, Princeton, New Jersey, August 15, 2000: *Designing for Affordability – A Microworld, Game-Theoretic Approach.*
145. *Seminar:* Pennsylvania State University, Department of Mechanical Engineering, University Park, February 1, 2000: *Enterprise Design: Integrating Product, Process and Organization in a Distributed Design Environment*.
146. *Seminar:* Institute for Computer Applications in Science and Engineering, NASA Langley Research *Seminar:* Center, Hampton, Virginia, August 9, 1999: *Product Realization in a Distributed Engineering Environment.*
147. *Seminar:* National Institute for Standards and Technology, Manufacturing Systems Integration Division, Gaithersburg, Maryland: July 27, 1999: *Product Realization in a Distributed Engineering Environment.*
148. *Seminar:* University of Texas at Arlington, Automation and Robotics Research Institute, Arlington, Texas May 21, 1999: *Realization of Complex Systems is a Distributed Environment.*
149. *Seminar:* National Institute of Standards and Technology, Manufacturing Systems Integration Division, Gaithersburg, Maryland, November 13, 1998: *Realization of Complex Systems in a Distributed Environment*.
150. *Seminar:* University of Michigan, Department of Mechanical Engineering and Applied Mechanics, Ann Arbor, Michigan, October 23, 1998: *Realization of Complex Systems in a Distributed Environment.*
151. *Seminar:* University of Minnesota, Department of Mechanical Engineering, Minneapolis, Minnesota, May 11, 1998: *Designing for the Global Marketplace in 2020.*[45]
152. *Seminar:* University of Minnesota, Department of Mechanical Engineering, Minneapolis, Minnesota, May 12, 1998: *Available Assets Based Mass Customization: Designing Product Families*.
153. *Seminar:* University of Minnesota, Department of Mechanical Engineering, Minneapolis, Minnesota, May 13, 1998: *Decision-Based Design: A Contemporary Paradigm for Research and Education in the Information Age*.

[45] Visiting Distinguished Professor. May 10 - 16, 1998.

154. *Seminar:* University of Minnesota, Department of Mechanical Engineering, Minneapolis, Minnesota, May 14, 1998: *Robust Concept Exploration and Ranged Sets of Specification*s.
155. *Seminar:* University of Minnesota, Department of Mechanical Engineering, Minneapolis, Minnesota, May 15, 1998: *Enterprise Integration: Designing in a Global Company*.
156. *Seminar:* Scientific Research Laboratory, Ford Motor Company, Dearborn, Michigan, August 21, 1997: *Available Assets Based Mass Customization: A Decision-Based Approach*.
157. *Seminar:* Varity-Perkins Plc., Peterborough, UK, June 27, 1997: *Available Assets Based Mass Customization: A Decision-Based Approach*.
158. *Seminar:* Lucent Technologies, Holmdel, New Jersey, June 20, 1997: *Available Assets Based Mass Customization: A Decision-Based Approach*.
159. Black & Decker, Towson, Maryland, May 5, 1997: *Mass Customization: A Winning Strategy.*
160. *Seminar:* Arizona State University, Department of Mechanical Engineering, Tempe, Arizona, April 11, 1997: *Integrated Product and Process Design: A Decision-Based Approach.*
161. *Seminar:* Boeing Airplane Company, Seattle, Washington, March, 19, 1997: *Decision Support Research Thrusts*.
162. *Seminar:* National Center for Advanced Technologies, Arlington, Virginia, February 12, 1997: *Teaming: Building a Learning Organization.*
163. *Seminar:* Kvaerner ASA, Oslo, Norway, September 17, 1996: *Change Agents and Industrial Products for a Global Marketplace*.
164. *Seminar:* Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia, June 19, 1996: *Living Systems Analogies in Decision-Based Design.*
165. *Seminar:* Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia, June 19, 1996: *Integrated Product and Process Design: A Decision-Based Approach.*
166. *Seminar:* Department of Mechanical and Aerospace Engineering, SUNY at Buffalo, Buffalo, New York, April 4, 1996: *Decision-Based Design: A Contemporary Paradigm for Research and Education in the Information Age*.
167. *Seminar:* Department of Mechanical Engineering, The Ohio State University, Columbus, Ohio, February 2, 1996: *Decision-Based Design: A Contemporary Paradigm for Research and Education in the Information Age*.
168. *Seminar:* Indian Professional Network, Decatur, Georgia, October 12, 1995: *Prospects of the Internet in Business and Education.*
169. *Seminar:* Goodyear Technical Center, Akron, Ohio, August 21, 1995: *Teaming to Win - How Can We Do More With Less?*
170. *Seminar:* American Society of Engineers of Indian Origin, Norcross, Georgia, June 10, 1995: *Living in the Systems Age.*
171. *Seminar:* Department of Defence, Naval Engineering Services, Canberra, Australia, July 25, 1994: *Future Engineering Design: A Decision-Based Approach.*
172. *Seminar:* Royal Institution of Naval Architects, Sydney, Australia, July 19, 1994: *Future Engineering Design: A Decision-Based Approach.*
173. *Seminar:* University of Sydney, Key Center of Design Computing, Department of Architectural and Design Science, Sydney, Australia, July 19, 1994: *How Would I like to Design? A Decision-Based Perspective.*
174. *Seminar:* NASA Langley Research Center, Institute for Computer Applications in Science and Engineering, Hampton, Virginia, April 11, 1994: *Robust and Axiomatic Design of Engineering Systems: A Decision-Based Approach.*
175. *Seminar:* Seoul National University, Seoul, Korea, March 24, 1994: *A Decision-Based Approach to Concurrent Design.*

176. *Seminar:* Korea Research Institute of Ships and Ocean Engineering, Taejon, Korea, March 23, 1994. *The Development of Top-Level Ship Specifications: A Decision-Based Approach.*
177. *Seminar:* Korea Research Institute of Ships and Ocean Engineering, Taejon, Korea, March 22, 1994: *A Decision-Based Approach to Concurrent Design.*
178. *Seminar:* University of Kentucky, Department of Mechanical Engineering, Lexington, Kentucky, February 21, 1994: *Designing for Manufacture at a High Level of Abstraction: A Decision-Based Approach.*
179. *Seminar:* Clemson University, Department of Mechanical Engineering, Clemson, South Carolina, February 11, 1994: *Robust and Axiomatic Design of Engineering Systems: A Decision-Based Approach.*
180. *Seminar:* N. Wadia College, Department of Computer Science, Poona University, India, August 4, 1993: *Research Issues in the Emerging Science of Design*.
181. *Seminar:* Massachusetts Institute of Technology, Department of Mechanical Engineering, Cambridge, Massachusetts, November 6, 1992: *Robust and Axiomatic Design of Engineering Systems: A Decision-Based Approach.*
182. *Seminar:* Georgia Institute of Technology, George W. Woodruff School of Mechanical Engineering, Atlanta, Georgia, April 9, 1992: *Decision-Based Design: A Contemporary Paradigm for Research and Education.*
183. *Seminar:* University of Sydney, Department of Architectural and Design Science, Sydney, Australia, May 20, 1991: *Designing Decisions: Axioms, Models and Applications*.
184. *Seminar:* NASA Johnson Space Center, Engineering Systems Division, Houston, Texas, November 9, 1990: *Designing Design Processes and Engineering Systems*.
185. *Seminar:* NL Baroid R&D Center, Houston, Texas, July 26, 1990: *Selection and Compromise in the Conceptual Design of Engineering Systems.*
186. *Seminar:* Shell Development Company, Westhollow Research Center, Houston, Texas, May 3, 1990: *Preliminary Design of a Filament-Wound Pressure Vessel Using Compromise Decision Support Problems*.
187. *Seminar:* Pennsylvania State University, Department of Mechanical Engineering, University Park, April 6, 1990: *Designing a Composite Material Pressure Vessel for Manufacture: A Case Study in Concurrent Engineering*.
188. *Seminar:* Indian Institute of Technology, Department of Mechanical Engineering, Bombay, India, January 9, 1990: *A Conceptual Model for Decision-Based Concurrent Engineering for the Life Cycle*.
189. *Seminar:* Indian Institute of Technology, Department of Mechanical Engineering, Bombay, India, January 9, 1990: *Development of a Curriculum for Engineering Design as It Moves from an Art Towards a Science: Some Issues*.
190. *Seminar: Seminar:* Institution of Naval Architects, Delhi Chapter, Delhi, India, December 20, 1989: *The Application of the Decision Support Problem Technique to Ship Design*.
191. *Seminar:* Engineers India Ltd., Delhi, India, December 18, 1989: *Evolving Issues in Design Methodology: Effect on Practice.*
192. *Seminar:* General Electric Company, Schenectady, New York, June 9, 1989: *Decision-Based Concurrent Engineering: A Conceptual Model.*
193. *Seminar:* University of Akron, Department of Mechanical Engineering, Akron, Ohio, May 2, 1989: *Concurrent Engineering: A Decision Based Approach.*
194. *Seminar:* Pennsylvania State University, Department of Mechanical Engineering, University Park, Pennsylvania, March 17, 1989: *Selection and Compromise in the Design of Engineering Systems.*
195. *Seminar:* Pennsylvania State University, Department of Mechanical Engineering, University Park, Pennsylvania, March 16, 1989: *As Engineering Design Moves from an Art Towards a Science: Some Thoughts on Curriculum Development.*
196. *Seminar:* West Virginia University, Concurrent Engineering Research Center, Morgantown, West Virginia, March 14, 1989: *Concurrent Engineering: A Decision Based Approach.*

197. *Seminar:* West Virginia University, Department of Mechanical Engineering, Morgantown, West Virginia, March 14, 1989: *Some Pedagogical Issues in Concurrent Engineering.*
198. *Seminar:* University of New South Wales, School of Mechanical and Industrial Engineering, Sydney, Australia, February 17, 1989: *New Developments in Teaching Engineering Design.*
199. *Seminar:* Xerox Corporation, Rochester, New York, June 6, 1988: *A Decision-Based Perspective for the Design of Methods for Systems Design*.
200. *Seminar:* DCAMM, Lyngby, Denmark, May 18, 1988: *The Decision Support Problem Technique: Its use in Design and Optimization*.
201. *Seminar:* University of Texas, Department of Mechanical Engineering, Austin, Texas, March 29, 1988: *A Decision-Based Perspective for the Design of Methods for Systems Design.*
202. *Seminar:* NASA Langley Research Center, Institute for Computer Applications in Science and Engineering, Hampton, Virginia, March 4, 1988: *Selection and Compromise in Conceptual Aircraft Design*.
203. *Seminar:* University of Houston, Department of Civil Engineering, Houston, Texas, November 5, 1987: *Computer-Based Decision Making for Engineers.*
204. *Seminar:* University of Houston, Department of Mechanical Engineering, Houston, Texas, September 24, 1987: *On the Conceptual Design of Ships and Aircraft.*
205. *Seminar:* B.F. Goodrich Company, R&D Center, Brecksville, Ohio, March 18, 1987: *Unified Life Cycle Engineering and the Decision Support Problem Technique*.
206. *Seminar:* Shell Development Company, Houston, Texas: U*nified Life Cycle Engineering and the Decision Support Problem Technique,* September 26, 1986.
207. *Seminar:* VPI & State University, Department of Aerospace and Ocean Engineering, Blacksburg Virginia: *Application of the Decision Support Problem Technique to Ships and Aircraft Design,* August 22, 1986.
208. *Seminar:* David Taylor Naval Ship Research and Development Center, Carderock, Maryland: *Application of the Decision Support Technique to Ship Design*, August 21, 1986.
209. *Seminar:* University of Notre Dame, Department of Mechanical Engineering: *The Decision Support Problem Technique: An Overview*, December 17, 1985.
210. *Seminar:* General Motors Research Laboratory, Troy, Michigan: *Computer-based Decision Making in Engineering Design,* September 20, 1985.
211. *Seminar:* Netherlands Ship Model Basin, Wageningen, Netherlands: S*hip Design using the Decision Support Problem Technique,* August 23, 1985.
212. *Seminar:* Institute for Mechanics and Control Theory, University of Siegen, Siegen, West Germany: *Design through Selection, Design of Damage Tolerant Structural Systems, Hierarchical Decision Making in Structural Design, An Algorithm for Solving Multiple Objective Optimization Problems,* June 6-11, 1985.
213. *Seminar:* Directorate of Naval Ship Design, Canberra, Australia: AUSEVAL: *A Ship Evaluation System,* May 22, 1985.
214. *Seminar:* University of Sydney, Department of Architectural Science, Sydney Australia: *Expert Systems, Mathematical Programming and Decision Making*, May 13, 1985.
215. *Seminar:* San Diego State University, Department of Mechanical Engineering: *Computer-based Decision Making in Engineering Design,* March 20, 1985.
216. *Seminar:* NASA Langley Research Center, Institute for Computer Applications in Science and Engineering, Hampton, Virginia: *Optimization of Large, Highly Complex Engineering Systems,* November 16, 1983.
217. *Seminar:* Institute for Mechanics and Control Theory, University of Siegen, Siegen, West Germany: *Design in the Systems Age-Overview, Decision Support Problems, Multi-objective Optimization, Case Studies,* October 28-November 1, 1983.
218. *Seminar:* University of New South Wales, School of Mechanical and Industrial Engineering, Sydney: *Design Education for the Systems Age*, June 13, 1983.

219. *Seminar:* University of Sydney, Department of Architectural Sciences, Sydney: *Design in the Systems Age - An Overview*, June 6, 1983.
220. *Seminar:* Carnegie-Mellon University, Pittsburgh: *Design of Damage Tolerant Systems*, April 4, 1983.
221. *Seminar:* Brian Watts and Associates, Houston: *Design of Damage Tolerant Offshore Systems,* February 11, 1983.
222. *Seminar:* Rice University, Department of Mechanical Engineering, Houston: *Design in the Systems Age,* February 4, 1983.
223. *Seminar:* Gulf R&D, Houston: *Design in the Systems Age,* July 23, 1982.
224. *Seminar:* NASA Johnson Space Center, Space Transport Systems Group, Houston: *Unified Computer-assisted Analysis and Non-linear Design Optimization*, March 18, 1981.
225. *Seminar:* University of Melbourne, Department of Mechanical Engineering, Melbourne, Australia: *Interactive, Computer-based Engineering Design*, September 16, 1980.
226. *Seminar:* Massachusetts Institute of Technology, Department of Ocean Engineering, Cambridge, Massachusetts: *Computer-based Design of Ship Structures: A Practical Optimization Approach*, October 25, 1979.
227. *Seminar:* Massachusetts Institute of Technology, Department of Ocean Engineering, Cambridge, Massachusetts: *A Practical Method for the Rational Design of Ship Structures,* October 16, 1979.
228. *Seminar:* Institution of Mechanical Engineers (Australia), Sydney, Australia: *An Optimization Method for the Design of Large Complex and Highly Constrained Practical Systems,* March 1979.
229. *Seminar:* University of Sydney, Department of Architectural Sciences, Sydney, Australia: *Computer-aided Design of Large, Complex Structures,* June 1978.
230. *Seminar:* University of Sydney, Department of Mechanical Engineering, Sydney, Australia: *Automated Design of Large Complex Structures,* June 1978.
231. *Seminar:* Norges Tekniski Hogskole, Institutt for Skipsbygging, Trondheim, Norway: *Automated Ship Structural Optimization,* July 1976.
232. *Seminar:* Department of Defence, Directorate of Naval Ship Design, Canberra, Australia: *Automated Design of Complex Structures,* April 1974; *Least Cost Optimization of Complex Steel Structures*, November 1975; *An Automated Ship Structural Optimization Method*, November 1976.

C Short Courses / Tutorials / Workshops. *Two since 2018.*

1. *Short course:* Sankalchand Patel University, Visnagar, Gujarat, India. *Creating and Communicating Knowledge.* July 29 through August 2, 2019. With Dr. Ashok K. Das.
2. *Short course:* Beijing Institute of Technology, Beijing, China. *Creating and Communicating Knowledge:* July 10 through 13, 2019. With Professor Janet K. Allen.
3. *Pilot Course for Transdisciplinary Convergence*: Indian Institute of Technology, Kharagpur, India. *Engineering Innovation in Sustainable Development.* August 16 to November 4, 2016. Co-developed course with Dr. Ram Babu Roy. Gave three modules (in person) and two tutorials (via Skype).
4. *Symposium:* Beijing Institute of Technology, Beijing, China. *International Symposium on Digital Platforms for Decision Based Design of Complex Engineered Systems.* June 21 and 22, 2016. Co-conveners Professor Janet K. Allen, Associate Professor Jitesh H. Panchal, Associate Professor Guoxin Wang, Professor Yan.
5. *Workshop:* Indian Institute of Technology, Kharagpur, India. *Sustainable Development: From Principles to Implementation.* May 23 through 28, 2016. Eighteen participants.
6. *Workshop:* Indian Institute of Technology, Kharagpur, India. Teaching, Learning and Convergence in the Transdisciplinary Program in Petroleum Engineering. March 17 and 18, 2015. Around 25 faculty participants.

7. *Short course:* Siksha 'O' Anusandhan University, Bhubaneswar, India. *Identifying and Developing Competencies for the 21st Century Indian Engineer.* June 16 and 17, 2014. With Janet K. Allen. Around 100 participants.
8. *Short course:* Siksha 'O' Anusandhan University, Bhubaneswar, India. *Faculty Development Workshop.* June 12 through 14, 2014. With Janet K. Allen. Around 50 participants.
9. The Indo-US Workshop on ICME for the Integrated Realization of Engineered Materials and Products in Pune, India from December 18-21, 2013. Eleven invitees from the US together with twenty invitees from India worked to clearly identify areas for focus, especially with regards to the interfaces between multiple disciplines and relevant research questions that are of importance in the immediate and near future to make ICME more industrially relevant and closely integrated with end product design. The workshop was co-funded by the Indo-US Science and Technology Forum and Tata Consultancy Services. The organizing team drawn from Georgia Tech, IIT Madras, Tata Consultancy Services was co-chaired by Farrokh Mistree (LA Comp Professor, AME) and Madhusudan Chakraborty (Director, IIT Bhubaneswar). A preliminary report on the "Way Forward" is available at
   URL: https://engineering.purdue.edu/DELP/IndoUS/
10. College of Engineering, Pune, India. *Identifying and Developing Competencies for the 21st Century Indian Engineer.* May 17-18, 2013. With Jitesh Panchal.
11. PanIIT Global Conference, New York. PanIIT Leadership Circle Education Forum. September 29, 2011. Half day.
12. GE Energy, Systems Engineering Advanced Program, Atlanta, Georgia. Strategic Systems Engineering, September 9, 2011. One day.
13. BP DEVAS Summer Camp, University of Oklahoma, Norman, Oklahoma. So You Want to Be an Engineer? June 14, 2011. Half day[46]. Co-instructor J.K. Allen.
14. BP Engineering Summer Academy, University of Oklahoma, Norman, Oklahoma. So You Want to Be an Engineer? June 14, 2011[47]. Half day. Co-instructor J.K. Allen.
15. Gujarat Technological University, Ahmedabad, Gujarat, India: Design of Experiential Learning Interactions and Environments, January 8-10, 2011. Co-instructors: Amy Bradshaw, Patricia Hardré, Farrokh Mistree, Zahed Siddique. Three days.
16. ASME International Design Technical Conference, Montreal, Canada: Unleashing Innovation Through Experiential Learning, August 15, 2010. Co-instructors: Amy Bradshaw, Patricia Hardré, Farrokh Mistree, Zahed Siddique. Half day.
17. National Center for Advanced Technologies, Crystal City, Maryland: Value Objectives within Open Systems & The Selection Decision Support Problem, October 16, 1996.
18. Scientific Atlanta, Atlanta, Georgia: Value Engineering, July 10-11, 1996.
19. Australian Maritime Engineering Cooperative Research Center, Inc., Sydney, Australia: Configuring Systems: A Decision-Based Approach, July 20-22, 1994.
20. Department of Defence, Naval Engineering Services, Canberra, Australia: Configuring Systems: A Decision-Based Approach, July 26-28, 1994.
21. NASA Johnson Space Center, Houston, Texas: Decision Support Problems: Their Use in the Early Stages of Project Initiation, 7 weeks @ 3 hrs./wk., February 1991.
22. Indo-US Forum for Cooperative Research and Technology Transfer, Delhi, India: Selection in Conceptual Design, December 20, 1989.
23. First International Applied Mechanical Systems Conference (IAMSDC-1) with Tutorial Workshops, Nashville, Tennessee: On the Spot Problem Solving using Decision Support Problems, June 14, 1989.
24. Offshore and Arctic Operations Symposium, Twelfth Annual Energy-Sources Technology Conference & Exhibition, Houston, Texas: On the Spot Problem Solving using Decision Support Problems, January 23, 1989.
25. Danish Technical University, Lyngby, Denmark: Formulation and Solution of Decision Support Problems: On-the-spot Problem Solving, May 17, 1988.

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[46] Best professor award.

[47] Best professor award.

26. Danish Technical University, Lyngby, Denmark: Decision Support Problems in Optimal Design, October 5-9, 1987.
27. Universal Technology Corporation, Dayton, Ohio: Optimization Techniques for a Unified Life Cycle Engineering Workstation, February 5-6, 1987. (W.F. Fuchs, S.Z. Kamal co-instructors.)
28. NL Industries, Houston, Texas: Computer-based Design Synthesis, August 1-2, 1984.
29. Indian Institute of Technology, Department of Naval Architecture, Kharagpur, India: Short (2 day) Course on Automated Design of Ship Structures, July 1977.

D Briefings

1 Tools for Creative Design: Designing Design Processes for Decision-Based Concurrent Engineering, AAAI Workshop on Creativity: Models, Methods and Tools, AAAI National Conference on Artificial Intelligence, Anaheim, California, July 14, 1991.

2 Concurrent Engineering: An Overview for the Human Resources Laboratory Logistics and Human Factors Division, Wright-Patterson Air Force Base, Dayton, Ohio, March 28 and 29, 1989. One member of seven member team, put together by the Institute of Defense Analysis, that presented this briefing. Contribution: A Decision-Based Perspective of Research Issues in Concurrent Engineering.

VI LEADERSHIP

1. Leadership - Administration

Director, School of Aerospace and Mechanical Engineering, University of Oklahoma (2009-2013). Success included but was not limited to getting, in 2011, no concerns or weaknesses in the ME and AE programs in all eight categories that were under the control of the AME faculty; four assistant professors were promoted to the rank of associate professor with tenure and one to the rank of associate professor; establishing a unique Baker Hughes International 21st Century Coop Program; significantly increasing interaction with industry and sponsorship of various activities (including capstone) within the school; both programs getting ranked after a number of years by the US News and World Report. Key initiatives included:

- To solicit collective wisdom and advocacy for change, energized the AME Board of Advisors.
- To enhance transparency and shared governance, established the Student Advisory Council, the Director's Advisory Committee and the Graduate Student Community, wrote weekly bulletins for the faculty, staff and student leaders.
- To obtain additional financial support for projects, launched fund raising drive.
- Focused on developing a strategic plan that was aligned to that of the College of Engineering. Reorganized how things were done to facilitate systematic implementation.
- Focused on ensuring a successful ABET accreditation for AE and ME programs; for the first time in many review cycles both programs passed muster on all eight criteria over which the AME faculty had control.

Associate Chair, Woodruff School of Mechanical Engineering, Georgia Tech (2005-2008).

I was responsible for the creation of undergraduate and graduate programs in the Woodruff School at Georgia Tech, Savannah. Success included, but was not limited to, defining a vision, attracting, recruiting and mentoring faculty, developing undergraduate and graduate laboratories, growing the undergraduate program substantially and creating three new undergraduate electives and getting the undergraduate program accredited by ABET for the first time for the full six years with no deficiencies, weaknesses or concerns related to the academic program; typically only 40% of the programs seeking accreditation for the first time get accredited for a full six years. Key initiatives included:

- Working with faculty in Atlanta and Savannah to ensure ABET accreditation of the new ME program within three years of taking up the position as Associate Chair.
- Proposing and implementing a very successful strategy for a rapid cluster hire.
- Focusing heavily on development of young faculty – both in research (career awards, publications, etc.) and teaching (design and delivery of new (non-traditional) courses.

Professor, Woodruff School of Mechanical Engineering, Georgia Tech (1992-2009)

Over my seventeen years at Georgia Tech I served on many, many committees. In this summary document I highlight a few where, in my opinion, I was able to make a difference.

- Chair, Strategic Planning Committee, Manufacturing Council, July 1994 - September 1995. Submitted a report to Dean John White who implemented several recommendations that have had far reaching impact in the success of the Manufacturing Research Center at Georgia Tech.
- Chair, Institute Oversight Committee – Post Tenure Review, Spring 2002 to Spring 2003 (inclusive). My committee drafted the policy that was accepted by the Faculty Assembly and the Faculty Senate for how to conduct the Periodic Peer Review at Georgia Tech.
- Member, Institute Review Committee, Fall 2000 to Spring 2003 inclusive. As a member of this committee I reviewed dossiers of all candidates that came up for promotion and tenure and participated in recommending best practices and modifications to procedures.
- Member, IT Council, Fall 2000 – Spring 2002. As a member of this council I volunteered with John Leonard to develop a first year course in computer programming for all engineering students at Georgia Tech. For additional information see resume Page 70.

Founding Director, Systems Realization Laboratory, Georgia Tech (1992-1997).

This was the first occurrence in the Woodruff School of faculty voluntarily deciding to share to gain and adopting principles of governance embodied in a Learning Organization as proffered by Peter Senge. In keeping with our motto "Happy people are always successful. Successful people are not necessarily happy" Drs. Allen, Bras, Mistree and Rosen, in 1992, defined their mission as striving to provide an opportunity for students, staff and faculty to learn how to rise to their full potential and sought colleagues – colleagues who have a dream and

a passion to make a difference and want to be thought leaders of tomorrow. In 2005 the Systems Realization Laboratory at Georgia Tech was recognized as one of the top 25 university-based design research laboratories in the world by a group of researchers at Cambridge University.

Allen, J.K., Bras, B., Mistree, F., Paredis, C.J.J., Rosen, D., 2005, "Georgia Institute of Technology: The Systems Realization Laboratory" Chapter 26 in Design Process Improvement - A Review of Current Practice, pages 490-493, (Clarkson, P.J. and Eckert, C. Eds.), Springer, New York. ISBN: 1-85233-701-X.

For the article please google what is shown in italics: *"Chapter 26 The Systems Realization Laboratory".*

2. Leadership - Service

Secretary-Treasurer of the Pi Tau Sigma, Mechanical Engineering Honor Society (1995-2008).

This was the longest tenure of any Secretary-Treasurer in the 90+ year history of the society. Some highlights: Most office operations were transitioned from paper, to computer, and subsequently to the web; the value of the PTS portfolio increased from around $180k to almost $500k; a PTS Scholarship Endowment of $300k was established; three scholarships were awarded for the first time at the Pi Tau Sigma Convention in February 2008. Georgia Tech Nu hosted two conventions – one in 1998 and the other in 2008. The legacy activities of the 1998 convention include a Graduate Fair to encourage students to pursue graduate studies, an industry / career fair and an invitation to contribute $5k to the PTS Scholarship Endowment. During the 13 years of Professor Mistree's stewardship the initiation fees remained the same and he did not receive any compensation for his service.

Chair, ASME Design Engineering Division Honors and Awards Committee, 1997 to 2003.

During Professor Mistree's tenure, the requirements for all the awards were codified electronically and we moved from a review process that was paper based to one that was done electronically. After many, many years the Design Engineering Division's Abbott Outstanding Service Award was once again awarded; he was instrumental in designing the glass sculpture that now goes with this award. Professor Mistree was instrumental in creating the ASME Ruth and Joel Outstanding Educator Award. This included drafting the guidelines and getting them adopted, designing the medal and plaque and, most importantly, raising $25,000+ to make this into a Society Award. A script for the awards ceremony that is still in use today was developed during his tenure and adopted by the DED Executive. The ASME Design Engineering Division Executive recognized Professor Mistree's service by giving him his second Distinguished Service Award in 2003.

PhD dissertations / MS theses / BS (Honors) theses

	UNSW	UH	GT	OU	**Total**
PhD		8	20	8	36
MS	1	21	31	12	65
UG (Hons.)	10	9		2	21
Total	11	38	51	21	**122**

I have mentored / co-mentored 36 doctoral students and 65 master's students, all of whom are well-placed around the world; 18 of my doctoral students are pursuing highly successful careers in academia. One (Wei Chen) was elected to the US National Academy of Engineering in 2019. In addition, I have mentored two students, one master's and one doctoral, who now own several for-profit colleges in Orissa, India. I am indebted to my 100 plus academic children for what we together have contributed to scholarship over the years. For additional information see Pages 2 through 11 and the Score Card on Page 88.

My design experience spans the areas of mechanical, aeronautical, structural, and industrial and systems engineering. Our papers span the design of mechanical, thermal, structural systems, materials, engineered systems (for example supply networks) and rural development. Applications include ships, aircraft, engines (aircraft and automobile), consumer products, computer data centers, materials processing, fail-safe supply networks, We are the recipient of several best paper awards. As a result of this work I have been fortunate to have been invited to give over 40 keynotes and plenaries, over 230 seminars and offered almost 30 short courses and workshops around the world; see Score Card on Page 87 for additional information.

Further, an outcome of my work with my co-authors has resulted in the publication of two textbooks (computer science and numerical methods), five research monographs spanning different disciplines, more than 500 publications with over 350 being peer reviewed and almost 50 dealing exclusively with education. Our work has been heavily cited; the cumulative number of citations of our top 5 journal papers alone is over 4000; Google Scholar May 15, 2023.

Google Scholar Citations on May 15, 2023

Google Scholar	All	Since 2018
Citations	16842	4269
h-index	60	29

From December 30, 2022 to January 1, 2023 there were 368 new citations
From January 4, 2021 to December 31, 2021 there were 1159 new citations.
From January 1, 2020 to December 31, 2020 there were 1612 new citations
From January 1, 2019 to January 8, 2020 there were 900 new citations
From December 27, 2018 to January 1, 2019 there were 1029 new citations
From December 31, 2017 to December 31, 2017 there were 1113 new citations
From December 31, 2016 to December 31, 2016 there were 669 new citations

The titles and summaries of a few of the noteworthy publications follow.

DECISION-BASED DESIGN – CONCEPT, THEORY AND SOFTWARE

Mistree, F., Smith, W. F., Bras, B., Allen, J. K. and Muster, D. 1990. "Decision-Based Design: A Contemporary Paradigm for Ship Design," Transactions, Society of Naval Architects and Marine Engineers, vol. 98, pp. 565-597. (402 citations, Google Scholar April 17, 2022.)

For decades ships have been designed using the well-known "basis ship approach" together with the equally well-known Evans-Buxton-Andrews spiral. The two principal limitations of the spiral are that the process of design is assumed to be sequential and the opportunity to include life-cycle considerations is limited. It is our contention that in order to increase both the efficiency and effectiveness of the process of ship design a new paradigm for the process of design is needed. In this paper recent developments in the field of design are reviewed and a contemporary paradigm, Decision-Based Design, for the design of ships is offered; one

that encompasses systems thinking and embodies the concept of concurrent engineering design for the life-cycle.

Note: Twenty-seven written discussions were received for this paper. This was the largest number in the history of the Society of Naval Architects and Marine Engineers. In addition to naval architects, discussers included people from aerospace engineering, mechanical engineering, architecture, the armed forces, and defence think tanks. This is the first published record of the phrase "Decision Based Design."

Mistree, F., Hughes, O. F. and Bras, B. A., 1993, "The Compromise Decision Support Problem and the Adaptive Linear Programming Algorithm" in Structural Optimization: Status and Promise, pages 247-286, (M. P. Kamat, Ed.), Washington, D.C.: AIAA. (495 citations, Google Scholar April 17, 2022.)

Decision Support Problems provide a means for modeling decisions encountered in design, manufacture and maintenance as defined above. Multiple objectives that are quantified using analysis-based "hard" and insight-based "soft" information can be modeled in the DSPs. For real-world, practical systems, not all of the information will be available for modeling systems comprehensively and correctly in the early stages of the project. Therefore, the solution to the problem, even if it is obtained using optimization techniques, cannot be the optimum with respect to the real world. However, this solution can be used to support a designer's quest for a superior solution. In a computer-assisted environment, this support is provided in the form of optimal solutions for Decision Support Problems. Formulation and solution of DSPs provide a means for making the following types of decisions:

- Selection - the indication of a preference, based on multiple attributes, for one among several feasible alternatives.
- Compromise - the improvement of a feasible alternative through modification.
- Hierarchical - decisions that involve interaction between sub-decisions.
- Conditional - decisions in which the risk and uncertainty of the outcome are taken into account.

Each of these decisions can be modeled as a compromise DSP which, in the context of this chapter, is a multi-objective, nonlinear optimization problem. Although the work in nonlinear mathematical programming is extensive, the interest in developing the means for modeling and solving problems that involve multiple and conflicting objectives in general and for hierarchical problems in particular is relatively sparse.

In this chapter, we describe an algorithm that has been specifically developed and successfully implemented for solving selection, compromise, hierarchical and conditional DSPs. Applications of these DSPs include the design of ships, damage tolerant structural and mechanical systems, the design of aircraft, mechanisms, thermal energy systems, design using composite materials and data compression. DSPs have been developed for hierarchical design; coupled selection-compromise, compromise-compromise and selection-selection. These constructs have been used to study interaction between design and manufacture and between various events in the conceptual phase of the design process. This algorithm is suitable for solving single and multiple objective optimization problems involving continuous variables and differentiable constraints. Its strength, however, lies is in the solution of different types of DSPs.

Simpson, T.W., Mauery T.M., Korte, J.J. and Mistree, F., 2001, "Kriging Models for Global Approximation in Simulation-Based Multidisciplinary Optimization," AIAA Journal, vol. 39, no. 12, pp. 2233-2241. (1246 citations, Google Scholar April 17, 2022.)

Response surface methods have been used for a variety of applications in aerospace engineering, particularly in multidisciplinary design optimization. The use of kriging models as alternatives to traditional second-order polynomial response surfaces for constructing global approximations is presented for use in a real aerospace engineering application, namely, the design of an aerospike nozzle. The objective is to examine the difficulties in building and using kriging models to create accurate global approximations to facilitate multidisciplinary design optimization. Error analysis of the response surface and kriging models is performed, along with a graphical comparison of the approximations. Four optimization problems are also formulated and solved using both sets of approximation models to gain insight into their use for multidisciplinary design optimization. The kriging models, which use only a constant "global" model and a Gaussian correlation function, yield global approximations that are slightly more accurate than the response surface models.

Lewis, K. and Mistree, F., 1998. "Collaborative, Sequential and Isolated Decisions in Design," ASME Journal of Mechanical Design, vol. 120, no.4, pp. 643-652. (261 citations, Google Scholar April 17, 2022)

The Massachusetts Institute of Technology (MIT) Commission on Industrial Productivity, in their report *Made in America*, found that six recurring weaknesses were hampering American manufacturing industries. The two weaknesses most relevant to product development were: 1) technological weakness in development and production, and 2) failures in cooperation. The remedies to these weaknesses are considered the essential twin pillars of Concurrent Engineering: 1) improved development process, and 2) closer cooperation. In the MIT report, it is recognized that total cooperation among teams in a Concurrent Engineering environment is rare in American industry, while the majority of the design research in mathematically modeling Concurrent Engineering has assumed total cooperation. In this paper, the authors present mathematical constructs, based on game theoretic principles, to model degrees of collaboration characterized by full cooperation, approximate cooperation, sequential decision making, and isolated decision making. The design of a pressure vessel is given to illustrate the theory, and the design of a passenger aircraft is given to illustrate the application to a large-scale systems design.

ROBUST DESIGN OF COMPLEX SYSTEMS

Chen, W., Allen, J.K, Tsui, K-L and Mistree, F. 1996. "A Procedure for Robust Design: Minimizing Variations Caused by Noise Factors and Control Factors," ASME Journal of Mechanical Design, vol. 118, no. 4, pp. 478-485. (810 citations, Google Scholar April 17, 2022.)

Several statisticians (e.g., Box, Nair, Tsui, etc.) in the late eighties and early nineties criticized Taguchi's approach. They observed that simulation-based experiments (unlike physical experiments) are deterministic without the random error associated with physical experiments. In this paper, we address these criticisms by recognizing that there are two broad categories of problems associated with simultaneously minimizing performance variations and bringing the mean on target, namely,

Type I - minimizing variations in performance caused by variations in noise factors (uncontrollable parameters).

Type II - minimizing variations in performance caused by variations in control factor (design variables).

We introduce a variation to the existing approaches to solve both Type 1 and Type II problems by correctly combining computational simulation and statistics. This variation embodies the integration of the Response Surface Methodology with the compromise Decision Support Problem. The design of a solar powered irrigation system is used as an example.

Since the publication of the paper we have postulated Type III and Type IV robust design:

Type III - determining adjustable ranges for control factors that satisfy a set of performance requirement targets and/or performance requirement ranges and are insensitive to the variability within the model.

Choi, H-J., Austin, R., Allen, J.K., McDowell, D.L. Mistree, F. and Benson D.J., 2005, "An Approach for Robust Design of Reactive Powder Metal Mixtures Based on Non-Deterministic Micro-Scale Shock Simulation," Journal of Computer Aided Materials Design, vol. 12, pp. 57-85. (93 citations, Google Scholar April 17, 2022.)

Type IV – determining adjustable ranges of control factor (design variable) values under the propagation and potential amplification of uncertainty in a process chain. Type IV robust design is focused on uncertainty associated with multi-time and length scaled simulation and analysis model chain.

Choi H-J., McDowell D. L., Rosen D., Allen J. K. and Mistree F., 2008, "An Inductive Design Exploration Method for Robust Multiscale Materials Design," ASME Journal of Mechanical Design, vol. 130, no. 3, pp. 031402-1/13. (119 citations, Google Scholar April 17, 2022.)

The preceding work is foundational to a major research thrust: The Integrated Realization of Engineered Materials, Products and Associated Manufacturing Processes:

Shukla, R., Kulkarni, N.H., Gautham, B.P., Singh, A.K., Mistree, F., Allen, J.K. and Panchal, J.H., 2014, "Design Exploration of Engineered Materials, Products, and Associated Industrial

Manufacturing Processes: An Inductive Method," JOM The Journal of the Minerals, Metals & Materials Society, in press[48] (17 citations, Google Scholar April 17, 2022)

Chen, W., Allen, J.K., Mavris, D., Mistree, F, 1996, "A Concept Exploration Method for Determining Robust Top-Level Specifications," Engineering Optimization, vol. 26, pp. 137-158. (204 citations, Google Scholar April 17, 2022)

In the early stages of design of complex systems, it is necessary to explore the design space to determine a suitable range for specifications and identify feasible starting points for design. A Robust Concept Exploration Method (RCEM) is developed to improve efficiency and effectiveness while making these early design decisions. An integrated design process is used to introduce quality considerations into the choice of robust top-level design specifications. This is achieved by integrating Taguchi's robust design principles and the Response Surface Methodology (RSM) into one multi-objective mathematical construct, namely, the compromise Decision Support Problem. Given the design requirements and integrated analysis packages at different levels of complexity, the method allows for the:

- quick evaluation of different design alternatives,
- generation of robust top-level design specifications which incorporate considerations from different disciplines.
- acquisition and shaping of knowledge to reduce or reorganize the design models without risking high costs.

The method is demonstrated for determining top-level specifications for airframe geometry and the propulsion system in the design of an integrated airframe/propulsion High Speed Civil Transport (HSCT) system.

Simpson T.W., Maier, J.R.A. and Mistree, F., 2001, "Product Platform Design: Method and Application," Research in Engineering Design, vol. 13, pp. 2-22. (819 citations, Google Scholar April 17, 2022.)

In this paper the focus is on scale-based product families derived from scalable product platforms that can be exploited from both a *functional* and a *manufacturing* standpoint to increase the potential benefits of having a common platform. While many companies have been successful with scalable product platforms, few, if any, have instituted a systematic approach to design: (i) the product platform and (ii) the corresponding family of products which are scaled around the product platform. Accordingly, in this paper the following question is addressed: *How can a scalable product platform and its resulting product family be efficiently and effectively modeled, analyzed, and designed?*

After a comprehensive review of the literature the Product Platform Concept Exploration Method (PPCEM) is introduced. The PPCEM facilitates the design of a family of products based on a scalable product platform. A family of ten universal electric motors are designed which are scaled around a common motor platform to realize a variety of torque requirements. Further, to mitigate the paucity of examples in this domain, detailed information for the universal electric motor example to enable other researchers to benchmark their methods with this example is presented. The effectiveness of the PPCEM is evaluated by comparing the family of motors obtained using the PPCEM to a group of individually optimized motors and the efficiency of the PPCEM is assessed by comparing the computational expense of designing the family of motors using the PPCEM to that of optimizing each motor individually. Thus the PPCEM provides an efficient and effective means of designing a scalable product platform and corresponding product family, promoting increased commonality within the product family with minimal performance tradeoff.

Seepersad, C.C., Dempsey, B., Allen, J.K., Mistree, F. and McDowell, D.L., 2004, "Design of Multifunctional Honeycomb Materials," AIAA Journal, vol. 42, no. 5, pp. 1025-1033. (131 citations, Google Scholar April 17, 2022.)

Extruded metal honeycombs [linear cellular alloys (LCAs)] are designed for a multifunctional application that demands not only structural performance but also heat transfer capabilities. The manufacturing process for LCAs enables complex in-plane cell topologies that may be tailored to achieve desired functionality. As a result, certain mechanical and heat transfer properties of LCAs are superior to those of hexagonal honeycombs or stochastic metal foams. Both periodic and functionally graded LCAs are designed for a

48 Invited paper.

structural heat transfer device for an electronic cooling application. The design problem is formulated as a multi-objective decision. Approximate models of structural and heat transfer performance, such as finite difference heat transfer simulations, are employed to analyze designs efficiently. A portfolio of heat exchanger designs is generated with both periodic and functionally graded cell topologies. Tradeoffs are assessed between thermal and structural performance. Previous authors have focused primarily on analysis of the structural and thermal properties of cellular materials; here, a design perspective is adopted. Given a set of rigorous analytical models, the emphasis is on synthesis of cellular designs and identification of superior design regions.

VERIFICATION AND VALIDATION OF DESIGN METHODS

Pedersen, K., Emblemsvåg, J., Bailey, R., Allen, J.K. and Mistree, F., 2000, "The 'Validation Square' – Validating Design Methods," ASME Design Theory and Methodology Conference, (Allen, JK, Ed.), New York: ASME, 2000. ASME DETC2000/DTM-14579. (185 citations, Google Scholar April 17, 2022.)

Seepersad, C.C, Pedersen, K., Emblemsvåg, J. Bailey, R.R., Allen, J.K., and Mistree, F., 2006, "The Validation Square: How Does One Validate Design Methods?" in Decision-Based Design: Making Effective Decisions in Product and Systems Design. (W. Chen, K. Lewis, and L. Schmidt, Eds.) New York, NY. ASME Press. Chapter 25, pp. 305-326. (117 citations, Google Scholar April 17, 2022.)

Validation of engineering research has traditionally been anchored in the context of scientific inquiry that demands formal, rigorous and quantitative validation. Logical induction and deduction play key roles in this formalism, making it particularly useful for validating internal consistency within the framework of the scientific method. Since much engineering research is based on mathematical modeling, this kind of validation has worked-and still works-very well. There are, however, other areas of engineering research that rely on subjective statements (qualitative information) as well as mathematical modeling, making formal, rigorous and quantitative validation problematic. One such area is that of design methods within the field of engineering design. In these publications, we explore the question: "*How does one validate design research in general, and design methods in particular, given that many proposed designs will never be realized and that it is often infeasible to follow the realized designs through their complete life cycles?*"

Anchored in the tradition of scientific inquiry, research validation is strongly tied to a fundamental problem addressed in epistemology: "*What is scientific knowledge, and how is new knowledge confirmed?*" Thus, we look to epistemology for: (1) reasons why the traditional approach of formal, rigorous and quantifiable validation is problematic for engineering design research; and (2) an alternative approach to research validation. We present a new validation procedure, namely, the Validation Square, and offer advice for applying it in an engineering design research context.

We recognize that no one has *the* answer to the questions we pose. To help us converge on an answer to these questions, we think aloud and invite you to join us. It is our hope that the ensuing discussion will enrich all of us as members of the design community.

CULMINATION OF THIRTY YEARS OF WORK ASSOCIATED WITH DESIGNING COMPLEX SYSTEMS

RESEARCH MONOGRAPH 1

McDowell D.L., Panchal, J. H., Choi, H.-J., Seepersad C. C., Allen J. K. and Mistree F. 2010. Integrated Design of Multiscale, Multifunctional Materials and Products, Elsevier, New York. ISBN-13: 978-1-85617-662-0. [49]
Based on the dissertations of Jitesh H. Panchal, Hae-Jin Choi and Carolyn B. Seepersad.
(171 citations, Google Scholar April 17, 2022.)

[49] http://www.elsevier.com/wps/find/bookdescription.cws_home/717627/description#description

In the mid-eighties I received a three year grant from the Shell Development Company to study a problem of my choice that would be of benefit to Shell Oil and the oil and gas industry. I chose to study the concurrent design of a filament would vessel and its manufacture[50]. A key paper resulted from this investigation:

Karandikar, H. M. and Mistree, F., 1992, "Designing a Composite Material Pressure Vessel for Manufacture: A Case Study for Concurrent Engineering," Engineering Optimization, vol. 18, no. 4, pp. 235-262. (31 citations, Google Scholar April 17, 2022)

We recognized that we had to consider uncertainty. As a consequence we spent a number of years exploring robust design. We (Janet K. Allen and Farrokh Mistree) teamed with David McDowell and published the following paper in 2002:

McDowell, D.L., Saxena, A., Mistree, F., and Allen, J.K., 2002, "Considerations for Systems-Based Design of Materials," Proceedings Plasticity '02, The 9th International Symposium on Plasticity and its Current Applications, Plasticity, Damage and Fracture at Macro, Micro and Nano Scales, (Eds. A.S. Khan and O. Lopez-Pamies), NEAT Press, pp. 36-38.

Janet K. Allen and I co-supervised three doctoral students with whom we published the monograph cited above thus culminating thirty years of work associated with designing complex systems.

Integrated Design of Multiscale, Multifunctional Materials and Products is the first of its type to consider not only design of materials, but concurrent design of materials and products. In other words, materials are not just selected on the basis of properties, but the composition and/or microstructure is designed to satisfy specific ranged sets of performance requirements. This book presents the motivation for pursuing concurrent design of materials and products, thoroughly discussing the details of multiscale modeling and multilevel robust design and provides details of the design methods/strategies along with selected examples of designing material attributes for specified system performance. In addition, it brings together the work on three types of robust design, robust design dealing with design variables, design parameters, and propagated uncertainty. And thus the authors provide a foundation for understanding how to manage uncertainty in a design process. It is intended as a monograph to serve as a foundational reference for instructors of courses at the senior and introductory graduate level in departments of materials science and engineering, mechanical engineering, aerospace engineering and civil engineering who are interested in next generation systems-based design of materials. The authors also provide foundational information on methods for *managing uncertainty* in a design process, including information on Types I through IV robust design and methods for multiscale modeling.

On reading our monograph, in 2011 we (Allen, Mistree and Panchal) were approached by Drs. Amarendra K. Singh and B.P. Gautham, Principal Scientists at the Tata Research, Development and Design Centre in Pune, India to collaborate with them in developing PREMAP (Platform for the Realization of Engineered Materials and Products). This project is of strategic importance to the company. Ours is a very active and productive collaboration: We are flown out to India three times a year and we teleconference every Sunday night (US) and Monday morning (India). This partnership has resulted in over 30 publications and Research Monograph 4

RESEARCH MONOGRAPH 2. FOUR SINCE 2017

Rezapour, S., Khosrojerdi, A., Rasoulifar, G., Allen, J.K., Panchal, J.H., Srinivasan, R.S., Tew, J.D. and Mistree, F, (2018), Architecting Fail-Safe Supply Networks, CRC Press. ISBN: 978-1138504264. Based on the dissertations of Shabnam Rezapour and Amirhossein Khosrojerdi.

A fail-safe supply network is designed to mitigate the impact of variations and disruptions on people and corporations. This is achieved by (1) developing a network structure to mitigate the impact of disruptions that distort the network structure and (2) planning flow through the network to neutralize the effects of variations.

[50] Predates ICME (Integrated Computational Materials Engineering) and the Materials Genome Initiative.

In this monograph, we propose a framework, develop mathematical models and provide examples of fail-safe supply network design. We show that, *contrary to current thinking* as embodied in the supply network literature, disruption management decisions made at the strategic network design level are not independent from variation management decisions made at the operational level. Accordingly, we suggest that it is beneficial to manage disruptions and variations concurrently in supply networks. This is achieved by architecting fail-safe supply networks, that are characterized by the following elements: reliability, robustness, flexibility, structural controllability, and resilience.

Organizations can use the framework developed in this monograph to manage variations and disruptions. Managers can select the best operational management strategies for their supply networks considering variations in supply and demand, and identify the best network restoration strategies including facility fortification, backup inventory, flexible production capacity, flexible inventory, and transportation route reconfiguration. The framework is generalizable to other complex engineered networks.

RESEARCH MONOGRAPH 3

Milisavljevic-Syed, J, Allen, J.K., Commuri, S and Mistree, F., 2020, Architecting Networked Engineered Systems: Manufacturing Systems Design for Industry 4.0, Springer Nature. Based on the dissertation of Jelena Milisavljevic-Syed.

In this monograph, the authors demonstrate how the integration of adaptability, operability, and re-configurability in the design of complex systems is indispensable for the further digitization of engineering systems in smart manufacturing.

Globalization of the customer base has resulted in distributed and networked manufacturing systems. However, current design methods are not suitable to address variations in product design, changes in production scale, or variations in product quality necessitated by dynamic changes in the market. Adaptability, operability, and re-configurability are key characteristics that are necessary to address the limitations of the current methods used to design networked manufacturing systems.

In recent years, the digital transformation driving Industry 4.0 has had an enormous impact on globally distributed manufacturing. Digitalization, the integration of digital technology into networked engineered systems, is increasingly being adopted to respond to changes in the market. This is achieved by means of (a) the concurrent design of adaptable systems, (b) addressing flexibility in design parameters, (c) conducting an operability analysis, and (d) employing a reconfiguration strategy to address faults and variances in product quality and re-establish connectivity among the elements in the system.

The design of manufacturing systems in the age of Industry 4.0 is addressed in this monograph. The authors introduce the concept of a 'smart platform' and a computational framework for the digitalization of networked manufacturing systems. They also suggest how the framework and techniques in this monograph are applicable beyond the manufacturing domain for architecting networked engineered systems in other industries such as chemical processes and health care, that are being transformed through the adoption of the Industry 4.0 construct.

RESEARCH MONOGRAPH 4

Nellippallil, A.B., Allen, J.K, Gautham, BP., Singh, A.K. and Mistree, F. 2020, Architecting Robust Co-Design of Materials, Products, and Manufacturing Processes, Springer Nature. Based on the dissertation of Anand Balu Nellippallil.

In this monograph, the authors explore systems-based, co-design, introducing a "Decision-Based, Co-Design" (DBCD) approach for the co-design of materials, products, and processes.

In recent years there have been significant advances in modeling and simulation of material behavior, from the smallest atomic scale to the macro scale. However, the uncertainties associated with these approaches and models across different scales need to be addressed to enable decision-making resulting in designs that are robust, that is, relatively insensitive to uncertainties. An approach that facilitates co-design is needed across material, product design and manufacturing processes. The authors describe a cloud-based platform to support decisions in the design of engineered systems (CB-PDSIDES), that feature an architecture that promotes co-design through the servitization of decision-making, knowledge capture and use templates that allow previous solutions to be reused. Placing the platform in the

cloud aids mass collaboration and open innovation. The monograph is a valuable reference on all areas related to the design of materials, products and processes, and should appeal to material scientists, design engineers and all those involved in the emerging interdisciplinary field of integrated computational materials engineering (ICME).

RESEARCH MONOGRAPH 5

Ming, Z., Wang Ru, Nellippallil, A.B, Wang, G., Yan, Y, Allen, J.K. and Mistree, F, "Architecting a Knowledge-Based Platform for Decision Support in the Design of Engineered Systems," Springer Nature. Under contract. Based on the dissertations of Zhenjun Ming, Anand Balu Nellippallil and Ru Wang.

Industry 4.0 is based on the digitization of manufacturing industries and has raised the prospect for substantial improvements in productivity, quality, and customer satisfaction. This digital transformation not only affects the way products are manufactured, but also creates new opportunities for the design of complex engineered systems (products, processes, services). In the monograph we describe architecting a computer platform to support human designers making decisions that have a major effect on closing design freedom associated with realization of complex engineered systems. We include theory fundamentals and describe tools for architecting knowledge-based platforms for decision support in the realization of complex engineered systems. Challenges associated with developing a computational platform for decision support for the realization of complex engineered systems in the context of Industry 4.0 are identified. Constructs for formulating design decisions (e.g., selection, compromise, and coupled decisions), knowledge modelling schemes (e.g., ontologies and modular templates), diagrams for designing decision workflows (e.g., the PEI-X diagram), and some analytical methods for robust design under uncertainty are presented. The platform is expected to support Designing Engineering 4.0[51] that includes end-to-end digital integration, customization and personalization, agile collaboration networks, open innovation, co-creation and crowdsourcing, product servitization and anything-as-a-service.

SYSTEMS REALIZATION LABORATORY @ UNIVERSITY OF OKLAHOMA. RESEARCH THRUSTS - 2023

Dr. Janet K. Allen and Dr. Farrokh Mistree

Janet K. Allen holds the John and Mary Moore Chair in the School of Industrial and Systems Engineering and ***Farrokh Mistree*** holds the L. A. Comp Chair in the School of Aerospace and Mechanical Engineering at the University of Oklahoma in Norman, Oklahoma. Both are Fellows of ASME. Janet and Farrokh co-direct the Systems Realization Laboratory @ OU. They hypothesize that

- ALL grand challenges can be modeled as Cyber-Physical-Social (CPS) systems.
- Public policy is foundational for addressing any grand challenge.

Hence, their interest in evolving CPS to support policy making. They seek to model evolving CPS systems as multi-echelon networks of services thereby ensuring the computational platform to be used to design and manage an evolving CPS is agnostic to domains of application. Their quest for answers to the key challenges associated with evolving CPS systems are anchored in the following research thrusts:

Platformization: Knowledge-Based Platform for Decision Support in the Design of Engineered Systems

- Predictive Analytics: Simulation of Future Outcomes using Limited Data
- Knowledge-Based Management of Computational Complexity and Risk
- Knowledge-Based Exploration of the Solution Space

Disruptive Innovations in the Cyber-Physical-Social Space

- Rural Development Policy: Evolving Food-Energy-Water Nexus for Sustainable Development
- Towards a Hydrogen Economy: Monetization of investment by industry, an equitable social return of investment for the government and community
- Sustainment Policy: Dynamic Management Fail-Safe Supply Networks
- Modernization Policy: Dynamic Management of Maintenance, Repair and Overhaul.t
- Education: Contextual Assessment of Student Learning through Reflection on Doing

[51] Jiao, R., Commuri, S. Panchal, J., Milisavljevic-Syed, J, Allen, J.K., Mistree, F. and Schaefer, D., "Design Engineering in the Age of Industry 4.0," ASME Journal of Mechanical Design, 143(7). 25 pages.

The Allen-Mistree education focus is on creating and implementing courses aimed at educating strategic engineers—those who have developed the competencies to create value in digitally transforming enterprises through the realization of complex engineered systems.

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LinkedIn Mistree	http://www.linkedin.com/pub/farrokh-mistree/9/838/8ba

VIII COURSE AND PROGRAM DEVELOPMENT

A. Course Development

COE1361*: Computing for Engineers.* At Georgia Tech, I was heavily involved (with JK Allen, J. Craig, J. Leonard, C. Paredis) from January 2001 through Spring 2003 in the politics, conception, development and offering of this course for our first year students. Over this period a full set of courseware has been developed. I was the TA for this course the first time it was offered by John Leonard in Spring 2001. I taught the course in Summer 2001 and 2002 and developed a full set of course notes and presentation slides. These were further developed by Janet K. Allen and Chris Paredis in 2002-2003. In Summer 2003, a joint committee of faculty from the Colleges and Computing and Engineering deemed COE1361 to be highly successful that it was adopted by the College of Computing under the number CS1371.

ME3110: *Creative Decisions and Design* was the first design course in the curriculum and was required for every ME student at the Georgia Institute of Technology. Product realization, over a 10 week quarter, was the focus of the course. Students were introduced to an often-turbulent imaginary world - Planet Vayu. The inhabitants of Vayu were required to solve a serious problem that required an engineered solution. Students designed and built a solution to this problem. One quarter they may have needed to build an evacuation device, another quarter a device that would transport and drop sleeping potion in enemy territory. Important activities included learning how to observe, reflect and articulate; understand the market; identify, formulate and solve decision problems that support human decision making; design a process for designing the artifact; design, build and test the artifact; and develop a rudimentary marketing strategy. In this context, the students planned their activities for the quarter, allocated resources (cost, time, and so on), and had an artifact ready to demonstrate under competition conditions near the quarter's end. Students experienced the interplay inherent in meeting design requirements subject to resource constraints, selecting most-likely-to-succeed alternatives, and resolving trade-offs. Decisions were introduced as key engineering constructs to support human designers in negotiating solutions to these interdisciplinary tasks. Several resources including textbooks, template worksheets, old reports, and software tools were made available through a *Design Learning Simulator.* The course was jointly developed by Drs. Allen, Mistree and Rosen. The Allen, Mistree and Rosen team terminated their involvement with ME3110 in Spring 1998.

AME4163: *Principles of Engineering Design.* Professor Zahed Siddique (an alum of ME3100) patterned AME4163 after ME3110 that he took as an undergraduate student at Georgia Tech. In Fall 2016, I joined Professor Siddique in offering and augmenting this course.

"Our goal is to provide an opportunity for you as a **junior engineer** to internalize the Principles of Engineering Design [POED] and to develop competencies that you need to hit the road running as a junior engineer in AME4553 and at a corporation in nine months' time. The internalization is facilitated by providing the opportunity for each of you to participate in **immersive, authentic design experiences** that requires the understanding and translating of customer requirements into technical specifications, defining the ensuing architecture of the mechanism, building and testing the mechanism under competition conditions. You will be required to **engage in a structured design process** that results in a mechanism that can be tested under competition conditions. You will also be **required to learn by reflecting on doing** in authentic immersive experiences that include lectures, meetings, projects, creating digital representations of the mechanism to facilitate analysis, etc."

Core papers include:

Autrey J.L, Sieber, J., Siddique, Z. and Mistree, F., 2018, "Leveraging Self-Assessment to Encourage Learning Through Reflection on Doing," International Journal of Engineering Education, vol. 4, no. 2(B), pp. 708-722.

Autrey, J.L., Mistree, F, and Siddique, Z., 2017, "A Strategy for Assessing Learning through Reflection on Doing," *2017 ASEE Annual Conference and Exposition: Design in Engineering Education*, Columbus, OH, June 25-28, 2017. Paper ID 19933.

ME4172: *Designing Sustainable Engineering Systems* is an elective course jointly developed by Drs. Allen and Mistree at Georgia Tech. Development of this course was underwritten by a sub-grant of a grant to the Center for Sustainable Technology from General Electric Fund for A Curriculum for Sustainable Development and Technology.

In this course, we provide an opportunity for students to answer the following questions: *What makes an engineering system sustainable and how can sustainability be designed into an engineering system?* The overall educational objective is to provide the opportunity to deepen understanding by undertaking a project in the design of sustainable engineering systems. The framework for this experience is decision-based design. At the end of the course, students have internalized the meaning of sustainability from different perspectives; can identify, formulate, and negotiate solutions to problems associated with sustainable development; and have gained a deeper understanding of issues typically associated with sustainable development.

The core of the course is the design project, but lectures and readings prepared students for the project and expanded their understanding of issues in sustainable development. We use cognitive mapping to keep the course responsive to each student. Cognitive mapping involves having students develop learning essays on each lecture, which the instructor reviews and grades in order to gather information on the learning styles and how well the approach is working with that student. Because it is important that students develop the ability to handle ambiguity, we provide tools to assist student in seeing structure within ambiguity; these tools include the Decision Support Problem Technique, including software, which is available on the Web. Throughout the course, we consciously help students to develop critical thinking skills and critical analysis skills.

This course was offered as a regular elective in the semester curriculum as ME4172: Understanding sustainability in context of market forces, availability of resources, technology, and society. Methods for identifying, modeling and selecting sustainable designs.

ME6102: *Designing Open Engineering Systems*. Spring Quarter 1993 through Spring Semester 2009 by Farrokh Mistree. This course is for the engineer who sort-of believes that:

- there is something beyond analysis and narrowly focused graduate courses,
- he/she would like to learn through doing,
- real-world issues are interesting to contemplate and solve, and
- there is an emerging science of design.

This course has been designed for those who are willing to take charge of their learning, to read regularly, think, take risks, be challenged, follow forks in the road and want to learn how to be advocates for change. Learning is orchestrated in the context of a question. In 1998 this question was: *How can product realization teams provide increased product variety at less cost for a highly competitive, global marketplace?*

This course has been highly successful; papers have been published by students and theses have been spawned.

In Spring 2008, we added a dimension of collective learning to the approach. The key instructional tools used in the course were: a) Learning Goals and Competencies, b)Assignments, c) Learning Essays, d) Individual answer to the Question for the Semester, e) Collaborative Answer to the Question for the Semester, f) Semester Learning Essay. The three main aspects of the course structure were Scaffolding, Customization, and Collaboration, where the scaffolded part sets the frame for the course, the customization allows personalized and individual learning and development and the collaboration part utilizes this developed diversity to create new knowledge and fosters collaborative learning. A new web-based collaborative learning framework was developed for this course. It served as a communication center for the distributed course participants. The framework provides the following functionality: a) online lecture material and videos, b) students' profiles, c) my ME6102 on a page, d) students' assignments and learning essays, e) ratings and comments on content by peers, f) best practices, g) collaborative answer to Q4S, h) student web-log (blog), i) discussion forums, and j) private messages.

One of the main features of the framework is the platform for the "Collaborative Answer to the Question for the Semester". It is based on an online wiki-system with a hierarchical structure of web pages that allows users to create sections and subsections that can be edited by anyone in the class. The log of revisions to the sections is maintained so it is also possible to see each individual's contribution to the collaborative answer. The setup simulates mass collaboration since it is not limited in participants and everybody can contribute independently; however the learning outcome is collaborative. The communication between the contributors is managed with discussion forums and private messages in the social network. This collaborative learning framework is not only a functional educational instruction tool but also a learning objective in itself. The students experience the new collaboration principles based on Globalization 3.0. They learn about the opportunities and challenges and how to utilize mass collaboration for creating new knowledge and breakthrough products.

Core papers include:

Rippel, M., Schaefer. D., Mistree, F. and Panchal, J.H., 2009, "Fostering Collaborative Learning and Mass-Customization of Education in a Graduate Engineering Design Course," International Journal of Engineering Education, vol. 25, no. 4, pp.729-744.

Schaefer, D., Panchal, J.H., Choi, S.K and F. Mistree, 2008, "Strategic Design of Engineering Education for the Flat World," International Journal of Engineering Education, vol. 24, no. 2, pp. 274-282.

Williams, C. and Mistree F., 2006, "Empowering Students To Learn How To Learn: Mass Customization Of A Graduate Engineering Design Course," International Journal of Engineering Education, vol. 22, no. 6, pp. 1269-1280.

AME5303: *Designing for Open Innovation* is a graduate course at the University of Oklahoma developed to help students learn how to develop personal competencies necessary for success in the innovation economy. The course has been designed, assignments developed and a learner-centric paradigm instantiated to foster students developing three "white space" competencies, namely, the ability to learn how to learn, the ability to speculate about the world of make believe and tie it to the world of reality, and the ability to pose questions worthy of investigation.

Core publications include:

Ge, X., Allen, J.K. and Mistree F., 2018, "Career Sustaining Competencies for Managing Disruptions and Innovative Problem Solving in a Digitized World," IEEE International Conference on Advanced Learning Technologies, IIT Bombay, India July 9-13. Paper ID 82.

Ifenthaler, D., Siddique, Z. and Mistree, F., 2014, "Learning How to Learn in Team-Based Engineering Education," Interactive Technology and Smart Education, vol. 11, no. 1, pp. 63 - 82. DOI: 10.1108/ITSE-10-2013-0025.

Mistree, F., Panchal, J.H., Schaefer, D., Allen, J.K, Haroon, S., and Siddique, Z., 2013, "Personalized Engineering Education for the 21st Century." In *Curriculum Models for the 21st Century*. (Eds. M. Gosspar and D. Ifenthaler) Springer, pp. 91-112.

Mistree, F., Ifenthaler, D. and Siddique, Z., 2013,. "Empowering Engineering Students to Learn How to Learn: A Competency-based Approach," ASEE Annual Conference and Exposition, Atlanta, GA. Paper Number AC 7324.

Mistree, F., Panchal, J.H., and Schaefer, D.,2012, "Mass-Customization: From Personalized Products to Personalized Engineering Education," Chapter 9 in Supply Chain Management, pages 150- 174, (Crosnik, A and Xiong, Y. Eds.), INTECH Rijeka, Croatia. ISBN 979-953-307-234-9.

ME/NRE/ChBE 7757 – *Teaching Practicum*. Fall 2003 through Fall 2008.

This course is required for all doctoral students in the Woodruff School of Mechanical Engineering. There are two components, namely, a lecture component and a practicum component. The student undertook the practicum component with a "teaching mentor" and the lecture component with me. In addition to students from the Woodruff School students from Bioengineering, Chemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering and Materials Science and Engineering have taken this course.

Over the years, I transformed the "Teaching Practicum" to a "Professional Practicum." I reduced the teaching component and introduced two new segments in the course, namely, preparing for a career after graduation and the role of an educated engineer in society. I created a scaffolded set of lectures, discussion sessions and assignments to help students learn how to create knowledge through observing, reflecting and articulating, how to identify objectives through abstraction, how to develop the meta-skills needed to analyze, synthesize and evaluate, how to negotiate, how to mentor others by understanding the other person's learning style, how to organize an elevator pitch, and become aware of how to be competitive in a rapidly changing world. To help students with their job applications and interviews I established an informal network of alums who offered both advice and practice interviews. Over the years I offered out of class lectures / discussion sessions on "how to" topics such as outlining and writing papers, structure of a MS theses / doctoral dissertation, critically evaluating / reviewing papers for journals, writing letters of recommendation, evaluating others, ethics in the workplace, verification and validation of research outcomes and claims, etc.

I believe I have made a difference in the lives of many students and this has been a source of joy and inspiration to me. This has turned out to be my favorite course and I would love to share the syllabus and material with others.

AME/ISE6970 – *Preparing for a Life in Academia.* First offered in Spring 2013 at the University of Oklahoma. This course is jointly developed by Professor Janet K. Allen and Farrokh Mistree. We believe that being a professor is the best job in the world. "We believe that being a professor is the best job in the world. We would like to share our enthusiasm for a life in academia, help you decide if indeed it is right for you and if the answer is - yes - help you get ready to apply for faculty positions." The end of semester submission is a draft application for a position in academia and a semester learning essay. The end of semester submissions are scaffolded as follows:

Exercise 1: Is a career in academia for you?
Exercise 2: In the context of Exercise 1, identify 3 universities at which you would like to have a job. Explain why you have chosen these three. Study each of them carefully.
Exercise 3: Prepare a CV which you could use to apply for a job in these universities.
Exercise 4: For any one of the universities you have selected, prepare a statement of research interest.
Exercise 5: To the same university as in E3, prepare a statement of teaching interests.
Exercise 6: Write a one-page personal narrative (in the third person) that can be used as a cover letter.
EOS Assignment: Submit an application packet that includes a one-page personal narrative, a CV, a research statement, a teaching statement and lessons learned as a result of taking this course.

The course is divided into four sets of lectures, namely, mentoring graduate students, getting hired, succeeding and managing one's career. Lectures cover topics such as preparing the application, telephone and campus interviews, identifying research questions, the NSF Career Proposal, writing scholarly papers, selling your ideas, preparing for tenure including first year activities followed by the third year review, managing a research laboratory, verification and validation, managing large classes, ethics and integrity, etc.

Courseware

EDUCATION TECHNOLOGY: *The Design Learning Simulator*.

EVANGELISTS: Janet Allen, Farrokh Mistree and David Rosen

The Design Learning Simulator was a computer-based environment in which students learned about design through the "doing" of design. The Design Learning Simulator consisted of three components - processes that are embodied, tools that support the processes, and a domain knowledge base from which

to gather information to complete tasks. Support for learning was limited to the early stages of design in which configurations and performance were simulated rather than the later stages of design in which physical models were constructed and tested. The Design Learning Simulator was available, from 1992 through 1997, on a website which also included course notes, workbook, software, past reports, past exams, primers, etc. All this material could be downloaded by anyone who chose to do so.

USE: ME3110: Creative Decisions and Design course was a junior level engineering design course which we taught for 5 years. In this course, we strove to help students learn about design as an intellectual cognitive activity through their participation in extended, team-based design experiences with open ended problems. Self-formed teams of students tackled open ended design problems, moving through a term long, structured design process - the Decision Support Process Technique - to arrive at a working complex mechanical artifact by the end of the quarter. The system realization process consisted of ten activities that distributed the workload across the eleven weeks of the quarter and took the student through the stages of conceptual design and meta-design (planning), through detailed design, to construction, demonstration, and even a little marketing. ME3110 was offered to about 100 students every quarter. It was a required course for ME, Nuclear Engineering and Textile & Fiber Engineering undergraduates.

SPONSORS: EduTech Institute. NSF Research Experience for Undergraduates. Procter and Gamble. $175,000 invested (excluding faculty time).

IMPACT: The traffic to this site has been high. Around 55% of the traffic is from educational institutions from the US. The rest is from companies and educational institutions from around the world.

Analyzed requests from Wed-26-Mar-1997 17:11 to Fri-24-Oct-1997 15:15 (211.9 days). Total completed requests: 246,388 (11,621). Total failed requests: 3,682 (138). Total redirected requests: 413 (6). Average requests per day: 1,181 (1,680). Number of distinct hosts served: 9,361 (510). Number of new hosts served in last 7 days: 301. Total bytes transferred: 1,780,966,571 (100,798,548) Average bytes transferred per day: 8,403,951 (14,399,792). (Figures in parentheses refer to the last 7 days).

Benefit to the practicing engineer: One of our primers that was developed for the DLS has been reprinted in:

"Basic Fastener Theory, Construction Dimensions," The Association of the Wall and Ceiling Industries, Vol. 26,. No. 5., Nov. 1997, pp. 17-23.

Core papers include:

Turns, J., Mistree, F. and Allen, J.K "Quantitatively Analyzing the Use and Usefulness of the Design Learning Simulator," American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 163005.

Clark, D.D., Mistree, F., Rosen, D.W. and Allen, J.K. "Function-Behavior-Structure: A Model for Decision-Based Design," American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 162501.

Turns, J., Newstetter, W., Allen, J.K., and Mistree, F. "The Reflective Learner: Supporting the Writing of Learning Essays That Support the Learning of Design Through Projects." American Society of Engineering Education, Milwaukee, Wisconsin, June 15-18, 1997. Paper Number: 22300.

B Program Development

Company Sponsored Collaborative Doctoral Program. August 1995 to December 1999.

Kvaerner Inc. was a major Norwegian engineering company (ships, energy, paper, etc.) that has offices all over the world. Kvaerner decided to establish a novel program at Georgia Tech and is making a significant investment ($1.5 million) in this venture with Georgia Tech. They established an "engineering office" in Atlanta. This office consisted of four engineers that they hand-picked as leaders of the future who worked towards their doctorates at Georgia Tech. Two were in ME, one in Materials Science and Engineering and one in Chemical Engineering. The engineers worked as a team on a project of interest to Kvaerner (a production ship in this case). The dissertations, in effect, reflected both individual and collective research. Each of the engineers had different expertise. The dissertations dealt with the following topics:

1 Kjartan Pedersen: Foundations for developing Engineering Systems from an Evolutionary Perspective. Advisors; Farrokh Mistree and Janet Allen. (ME)
2 Yeeweng Low: POWGEN A Design Method for Power Generation Systems. Advisor: Jon Colton. (ME)
3 Evert Grodal: Designing Standard, Modular, and Flexible Hydrocarbon Production Separation Systems. Advisor: Matthew Realff. (ChE)
4 Morten Langoy: Influence of the Environment on the Fatigue Crack Growth Behavior of Titanium Alloy Ti-6Al-4V-0.1TU. (To be used for designing and building "risers.") Advisor: Stuart Stock. (MSE).

The advisory committee for this project consisted of the five dissertation advisors plus Ward Winer (Chair, Woodruff School), Jean-Lou Chameau (Provost), Ashok Saxena (Chair, Materials Science and Engineering) and Lanny Feorene (Georgia Tech Research Institute).

Langoy, Low and Pedersen completed their dissertations in 1999. Grodal graduated with a MS in Chemical Engineering in 2000.

This program provided an interesting model for graduate education. Kvaerner provided the problem and information to support the dissertations. Our counterparts from Kvaerner visited Atlanta at least twice a year. An annual review of the progress was held in Europe once a year. Kvaerner was pleased with the outcome.

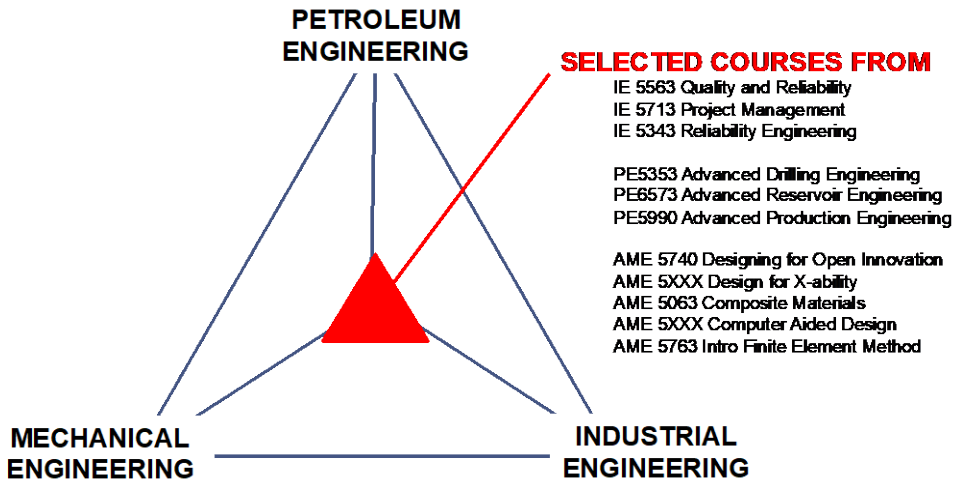
Baker Hughes 21st Century Co-op. 2013 to 2018.

Evangelists: AME: Farrokh Mistree and Zahed Siddique. PE: Maysam Pournik and Chandra Rai
The 21st Century Co-Op at the University of Oklahoma Schools of Aerospace and Mechanical Engineering and the Mewbourne School is a five year BS/MS degree program in mechanical engineering and petroleum engineering, respectively. Our aim over the three years of this program is to have BHI Scholars work as a team on different aspects of a flagship project identified by BHI. In addition to core courses in each of the disciplines the curriculum includes cross-disciplinary courses (industrial, mechanical and petroleum engineering), customized courses jointly offered by BHI engineers and faculty during summer internships, a senior capstone experience and graduate theses that are of relevance to Baker Hughes, and graduate cross-disciplinary courses.

Baker Hughes 21st Century Co-Op Scholars are chosen in the fall of their sophomore year. Selected students, the Baker Hughes Scholars (BHS), work as a team with the BH Mentor (BHM) and the Faculty Mentor (FM) for three years. The BHS intern at BHI during in the summers at the end of their Sophomore, Junior and Senior years.

- Sophomore internship - learn about BHI and identify project to be worked under FM supervision when they return to OU.
- Junior internship – continue to learn about BHI and take an experimental elective for credit offered jointly by BHI engineer and FM. Identify capstone project.

- Senior internship – take a course for credit that is taught jointly by BHI engineer and FM, plus identify and work on MS project.
- Fifth year at OU – Work on BHI MS project under supervision of FM and BHM / BHI engineers
- Fourth and fifth years: The BHS scholar degree plan that is jointly worked out by BHM/FM.



International Systems Realization Partnership. Since 2015.

On November 25, 2015 the Institute of Industrial Engineering (Dr. Wang @ Beijing Institute of Technology), The Design Engineering Laboratory (Dr. Panchal @ Purdue) and the Systems Realization Laboratory (Allen and Mistree @ OU) launched the ISRP in Beijing China. The vision is to collaborate on research associated with the realization of complex systems. In June 2016, the ISRP hosted the International Symposium on Digital Platforms for Decision Based Design of Complex Engineered Systems. In June 2018 the ISRP organized a successful symposium titled *Platformization for Decision Support in Engineering Design*. In 2019 the ISRP expanded to include partners from the University at Buffalo, Mississippi State University and the University of Liverpool, UK. The goal for the next three years is to focus on fundamental research, publications and the collaborative education of graduate students. The envisaged outcome is a cloud-based computational platform to support human decision making. This collaboration has resulted in two dissertations co-supervised by Professors Allen and Mistree with their counterparts in Beijing, over fifteen publications with two in *Information Science* (Impact Factor 5.91), five in *Advanced Engineering Informatics* (Impact Factor 3.772) and one in *Computers in Industry* (Impact Factor 3.95). A research monograph was published in 2020:

> Ming, Z., Wang Ru, Nellippallil, A.B, Wang, G., Yan, Y, Allen, J.K. and Mistree, F, 2022, "Architecting a Knowledge-Based Platform for Decision Support in the Design of Engineered Systems," Springer Nature. Based on the dissertations of Zhenjun Ming, Anand Balu Nellippallil and Ru Wang. https://link.springer.com/book/10.1007/978-3-030-90521-7

The publication was delayed on account of Covid 19. The collaboration continues.

IX SERVICE

A Professional Contributions - Selected

Leadership in Administration

Director, School of Aerospace and Mechanical Engineering, University of Oklahoma, Norman

I served as the Director of the School of Aerospace and Mechanical Engineering at the University of Oklahoma from August 2009 to August 15, 2013.

Challenges included dealing with increasing undergraduate student enrollments, no faculty hires, dealing with of substantial budget cuts, and getting the AE and ME programs reaccredited (both came clean on all eight criteria over which the faculty had control).

Success included but was not limited to

- defining a vision and embodying it in a strategic plan that was aligned with the college strategic plan,
- energizing the AME Board of Advisors to be recognized by the Dean as the most active BoA in the College of Engineering,
- mentoring four assistant professors to promotion and tenure,
- showcasing the accomplishments of the AME faculty, staff and students through various media,
- fostering shared governance through participation of students, staff and faculty in decision making,
- reaching out to AME alums using social media,
- launching a fund raising program, formalizing the interdisciplinary capstone program with Industrial and Systems Engineering, and
- promoting interdisciplinary activities within the college of engineering and between colleges (Arts and Science; Education).

Associate Chair, Woodruff School of Mechanical Engineering, Georgia Tech Savannah

I served as Associate Chair of the Woodruff School in Savannah from July 2005 through December 2008. As Associate Chair, I worked to achieve the following objectives:

- Create graduate and undergraduate programs
  - that are complementary and add value to those in Atlanta,
  - that the Woodruff School faculty is proud to call its own, and
  - to which students seek admission because they want to and not because they cannot get into the programs in Atlanta.
- Create and nurture a working environment wherein young faculty are able to shine by undertaking program development and research that is anchored in the scholarship of integration and the scholarship of education.

Success included, but was not limited to, defining a vision, attracting, recruiting[52] and mentoring faculty, developing undergraduate and graduate laboratories, growing the undergraduate program substantially and creating three new undergraduate electives and getting the undergraduate program accredited by ABET for the first time for the full six years with no deficiencies, weaknesses or concerns related to the academic program. We came through clean on 8 of the 9 ABET criteria. We got one well-deserved non-programmatic concern – one over which the Woodruff School Savannah faculty had no control. This, in my mind, is a singular achievement for a new program[53] put together over two years by a faculty that consisted of three newly hired Assistant Professors, three newly hired Visiting Assistant Professors, one untenured Associate Professor and one tenured faculty member – me. ☺

Secretary-Treasurer, Pi Tau Sigma Mechanical Engineering Honor Society. December 1995 to February 2008.

This was the longest tenure of any Secretary-Treasurer in the 90+ year history of the society. During my tenure

- Most office operations were transitioned from paper, to computer, to the web.
- The value of the PTS portfolio increased from around $180k to almost $500k.
- A PTS Scholarship Endowment of $300k was established.
- Three scholarships were awarded for the first time at the PTS Convention in February 2008 on the occasion of the Georgia Tech Nu chapter's 75th Anniversary.

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52 Two untenured Associate Professors, three untenured Assistant Professors and three Visiting Assistant Professors.

53 I understand less than 40% of the programs seeking accreditation for the first time get accredited for six years.

- GT Nu hosted two conventions - one in 1998 and the other in 2008. The legacy activities from the 1998 convention are as follows:
  - All conventions post 1997 have included a Graduate Fair to encourage students to pursue graduate studies.
  - All conventions post 1997 have included an Industry / Career fair.
  - All convention hosts, post 1997, were invited to contribute $5k to the PTS Scholarship Endowment. A majority have done so.

Chair, ASME Design Engineering Division Honors and Awards Committee, July 1997 to June 2003.
During my tenure, the requirements for all the awards were codified electronically and we moved from a review process that was paper based to one that was done electronically. After many, many years the Design Engineering Division's Abbott Outstanding Service Award was once again awarded; I was instrumental in designing the glass sculpture that now goes with this award. I was instrumental in creating the ASME Ruth and Joel Outstanding Educator Award. This included drafting the guidelines and getting them adopted, designing the medal and plaque and most importantly raising $25,000+ to make this into a Society Award. A script for the awards ceremony was developed during my tenure and adopted by the DED Executive. I was touched to receive the Distinguished Service Award from my colleagues in the International, Design Engineering Division in 2003.

Founding Director, Systems Realization Laboratory, 1992 - 1997.
The Systems Realization Laboratory was founded by four faculty (Farrokh Mistree, Janet Allen, Bert Bras and David Rosen) who all came to Georgia Tech in 1992[54]. This was the first occurrence in the Woodruff School of faculty voluntarily deciding to share to gain and adopt the principles of governance embodied in a Learning Organization as proffered by Peter Senge. In keeping with our motto "Happy people are always successful. Successful people are not necessarily happy" we defined our mission as striving to provide an opportunity for students, staff and faculty to learn how to rise to their full potential and sought colleagues - colleagues who have a dream and a passion to make a difference and want to be the thought leaders of tomorrow. For further information on the Systems Realization Laboratory and its alums please visit http://www.srl.gatech.edu. For research-related information dated 2005 please google what is shown in italics: *"Chapter 26 The Systems Realization Laboratory".*

Advisory Boards

Member, Board of Advisors, *Incuvations* Foundation, National Institute of Science and Technology, Palur Hills, Berhampur, Odisha, India. Since March 27, 2021.
Member, Advisory Board, SunMoksha Ltd., Bangalore, India. Since October 2019.
Member, Distinguished Alumnus of IIT Kharagpur Recognition Committee. April 2016 to April 2018. Since April 2020.
Member, International Advisory Board, Siksha 'O' Anusandhan University, Bhubaneswar, India. Since January 2014.
Member, Industrial Advisory Board, Department of Mechanical Engineering, University of Illinois – Chicago. April 2011 to April 2018.
Member, International Advisory Committee, National University of Singapore's Design Technology Institute, February 2002 to September 2005.
Member, Industrial Advisory Board, Department of Mechanical Engineering, University of Illinois – Chicago, October 2001 to December 2006.

Expert Panels / C-Lead

Indian Institute of Technology, Kharagpur, India. The twin goals for IIT Kharagpur, in the next five years, is to establish itself as a destination of choice for university-based research and technology development and rise in the world rankings. Since August 2020 I have been a co-lead on putting together a plan of action for the Advanced Manufacturing Center at IIT Kharagpur to become the "virtual" destination of choice for researchers from around the world. My appointment lasted until May 2021.

AIAA Region IV Associate Fellow Review Committee.
May 6, 2018 through July 23, 2018.

[54] Chris Paredis joined us in 2002 and Seung-Kyum Choi and Dirk Schaefer in 2005.

June 6, 2019 through August 6, 2019.

We reviewed 25 candidates each year for election to Associate Fellow of AIAA. The review was thorough. It involved a calibration exercise and several teleconferences and email exchanges. I estimate that I spent at least 30 hours on this exercise each year. Fortunately, the heavy lifting was done over the summer.

Review ABET Self-Study Report: Review and in-depth discussion with authors of draft self-study report to the ABET EAC by Southern Arkansas University. SAU went up for ABET accreditation for the first time in 2018. Two-day site visit to mentor in March 2018. Lionel Hewavitharana visited OU during AME capstone Fair in 2018. I helped write 30-day response on December 3, 2018 and edited the following correspondence. In June 2019 SAU received 6 year accreditation for their program in General Engineering.

Member, *NASA Vision Expert Panel:* Education and Training, Nexight Group, Silver Springs, Maryland. March 12, 2017 to October 19, 2017. This panel was tasked to review and comment on the education and research component of the *NASA Vision 2040 Study: A Vision for Multi-Scale Materials and Structural Modeling*. This was a herculean task that involved studying the report, participating in several conference calls and writing key sections of the panel's report. I estimate that I spent at least 30 hours on this exercise. I am very, very pleased with my having participated in this exercise since I was able to make, in my opinion, a significant difference to the eventual outcome. Received a "commendation" letter from Jared Kosters the Technical Project Manager, Nexight Group, Silver Springs, Maryland dated March 2, 2018

External Review: University of Illinois, Chicago. October 31 and November 1, 2016, Department of Mechanical and Industrial Engineering and the Energy Resources Center.

Member, Integrated Computational Materials Engineering (ICME): Unlocking the Potential and Realizing the Vision - ICME Crosscutting Implementation Study Team. Report published in June 2013. Funded by DoD, DoE and NSF. Coordinated by The Minerals, Metals and Materials Society (TMS).

Journals

Member, Editorial Advisory Board, Engineering Optimization, Gordon and Breach Science Publishers, since 1989.

Member, International Advisory Board, Concurrent Engineering: Research and Applications, Academic Press, since 1992.

Member, Editorial Board, Engineering Design and Automation, John Wiley and Sons, 1994-1999.

B. Campus Contributions - Selected

University of Oklahoma

Graduate College @ OU

Member, Dean's Task Force on Mentoring Graduate Students. September 2018 to May 2019.

Gallogly College of Engineering

Member, Perkinson Chair Search Committee. Fall 2012 through Spring 2013. Meetings typically once a month in addition to time spent developing advertisement, writing initial drafts of first and second screening documents and reaching out to potential candidates. Sent over 150 personal emails. Followed through on several leads by email and phone calls. Responsible for the applications from four of the eight candidates that went through the first screening.

Member of CoE Leadership Team. Fall 2009 through Spring 2013. Typically met once a week throughout year.

School of Aerospace and Mechanical Engineering

Graduate Student Community. Founder (2010) and Faculty Mentor (since 2013). Focused on improving the quality of life of graduate students at OU. Activities include weekly webinars in Fall and Spring semesters, Lightening Talks (ASME Central Oklahoma Chapter), International Food Festival, mentoring 3 Minute Thesis participants and Teach Test, maintain a Face Book page and a GSC YouTube Channel, assist Dean of GCOE and Director of AME in graduate student outreach.

Chair of AME Committee for Continuous Improvement and Special Projects. Once or twice a semester. Spring 2010 through Spring 2013.

Chair, Director's Advisory Committee. Typically once a week during fall and spring semesters. Fall 2009 through Spring 2013.
Co-Chair, AME Student Advisory Council. Met twice a semester. Spring 2010 through Spring 2013.
Member of AME Board of Advisors. Meet twice a year. Teleconferences four times a year. Dinner for local members twice a year. Fall 2009 through Spring 2013.

Georgia Institute of Technology - selected

Institute

Chair, Institute Oversight Committee – Post Tenure Review, Spring 2002 to Spring 2003 (inclusive).
Member, Institute Oversight Committee – Post Tenure Review, Spring 2001.
Member, Institute Review Committee, Fall 2000 to Spring 2003 inclusive.
Member, IT Council, Fall 2000 – Spring 2002.
Member, Institute Undergraduate Committee, October 1996 - August 1999.
Chair, Strategic Planning Committee, Manufacturing Council, July 1994 - September 1995.
Elected Member, Faculty Senate, September 1994 - 1996.
Elected Member, Faculty Assembly, September 1994 - 1996.

Woodruff School of Mechanical Engineering

Associate Chair, Woodruff School of Mechanical Engineering, July 2005 – December 2008.
Chair, Woodruff School Savannah Steering Committee, 2005 - 2007.
Member, Reappointment, Promotion and Tenure Committee, 1994-1995, 2002 - 2005.
Member, Post-Tenure Review Committee, 2001.
Elected Member, Faculty Advisory Committee, 1997 - 1999.

University of Houston - selected

Member, Advisory Committee to Senior Vice President on Promotion and Tenure, 1990-92.
Member, University Planning (1990-95) Review Sub-Committee, 1988.
Cullen College of Engineering, University of Houston
Member, College Promotion and Tenure Committee, 1990-92.
Member, College Governance Committee, 1990-91.
Associate Director, Engineering Computations Facility, October 1983 to August 1985.
Department of Mechanical Engineering, University of Houston
Director, Graduate Recruiting and Admissions, October 1990 to July 1992.
Director, Computations Laboratory, August 1984 to July 1986, September 1989 to 1991.
Chair, Industry Liaison Committee, October 1987 to September 1988.
Chair, Computer Policy Committee, August 1983 to January 1985.

University of New South Wales, Sydney, Australia - selected

Engineering Dean's Representative on the Pro-Vice Chancellor's Computer Acquisition and Policy Board, 1977 and 1978.

C. Other Contributions - selected

Civic Activities (time intensive)

1 Chair, Zoroastrian Faculty Network since June 2018. Our aim is to encourage Zoroastrian youth to pursue graduate degrees under the mentorship of Zoroastrian faculty with the aim of helping them succeed professionally, develop a social conscience that motivates them "give back" to the community. Since September 2020 we have organized monthly webinars for Zoroastrian Parents and Progeny. I have mentored a team of Young Professionals (Canada, India, UK and US) to learn how to develop content and then communicate and mentor the next generation of Zoroastrian graduate students from India and Pakistan. I coach panelists and also moderate the webinars. In CY 2021, 11 international webinars were recorded and uploaded to the YouTube Channel http://bit.ly/zfnyoutube

2 *Freedom Employment Academy, Delhi, India.* https://feaindia.org/ An IIT Delhi alum has set up a program in India to teach English and professional skills to 27,000 economically-disadvantaged students every day. In calendar year 2020 I served as a Mentor to 18 students. This involved 5 formal

meetings feedback on assignments. This was a huge success. I was invited to advise the coordinators on modifying their mentoring curriculum, mentoring the teachers (around 40) and giving two talks to foster professional development. The professional development talks continued in 2021. Aside: The IIT Delhi alum is spending $US4 million a year.

3 Chair, Legacy Congress 2000 Scholarships Judging Committee, Zoroastrian Association of Houston. From 2005 to 2020.

4 Workshop for *College Bound Kids and Their Parents*. Zoroastrian Association of Houston, ZAH Community Center, Houston, Texas. Since October 2010. Three hours. With J.K. Allen

5 Federation of Zoroastrian Associations of North America (FEZANA) Executive, Assistant Secretary. May 2002 to May 2006.

6 Member, FEZANA World Body Working Group, May 2001 to June 2003.

7 Sunday School Teacher, monthly June 1974 – October 2001.

8 Mistree, K. P. and Shahzadi, F., *The Zarathushti Religion: A Basic Text,* (Editor and Compositor), FEZANA, Hinsdale, Illinois, 1998. ISBN 0-9666985-0-9.

9 Program Chair, Seventh North American Zoroastrian Congress, Houston, Texas, July 1990.

10 Proceedings Seventh North American Zoroastrian Congress, 271 pages, (F. Mistree and J.K. Allen, Eds.), Zoroastrian Association of Houston, Houston, Texas, September 1992.

11 Reader of Scripts for Radio Show: John H. Lienhard's Engines of our Ingenuity is carried by almost 40 National Public Radio stations. Critically read, evaluated and commented on about 100 three minute radio scripts in 1992. http://www.uh.edu/engines/jhlbio.htm

12 Member, Building Fund Zoroastrian Association of Houston, Houston, Texas, 1988-1992.

13 Chair, Building Fund Committee, Australian Zoroastrian Association, Sydney, Australia, 1976-80.

X HONORS AND AWARDS

Honors: Professional / National / International

1. **Recognition:** Pahl-Beitz ICONNN Award for contributions to design science and education. January 9, 2023. ICORD'23, Indian Institute of Science, Bangalore, India.
2. **Recognition:** Outstanding Zarathushti Professional of the Year 2021. World Zoroastrian Chamber of Commerce. February 10, 2022. https://wzcc.org/#slide8
3. **Recognition**: "According to a recent study published in the journal *PLOS Biology*, 197 University of Oklahoma researchers are listed as among the most influential 100,000 researchers in the world." I am one of those cited in this 2020 report.[55]
4. **Lifetime Achievement Award,** International Society for Agile Manufacturing, Lafayette, Louisiana. December 16, 2012.
5. **Distinguished Alumnus**, Indian Institute of Technology, Kharagpur, India. September 15, 2012.
6. **Ruth and Joel Spira Outstanding Educator Award,** ASME International, USA. November 2011.
   Citation: "For lifelong dedication and numerous contributions to the engineering design community, particularly for instilling a passion for design in generations of students as an inspirational advisor and mentor."
7. **Professor Emeritus**. Georgia Institute of Technology, Atlanta, Georgia. August 2009.
8. **2003 Distinguished Service Award.** ASME International, Design Engineering Division.
9. **Associate Fellow,** American Institute for Aeronautics and Astronautics, Washington, D.C. Elected: 1999.
10. **Design Automation Award.** ASME International, Design Engineering Division, Design Automation Committee, September 14, 1999.
    Citation: "In testimony of the high regard of your associates and deep appreciation of the Society for your valued services in advancing the engineering profession as an agent for change, a visionary, dedicated, innovator of design automation. An educator who has inspired countless students to learn how to design, and more importantly, to learn how to learn. A researcher who wants to have fun – fun in defining the emerging science-based discipline of design, fun in providing an opportunity for highly motivated and talented students to learn how to achieve their dreams."
11. **1998 Distinguished Service Award.** ASME International, Design Engineering Division.
12. **Fellow,** American Society of Mechanical Engineers, New York. Elected: 1994.
13. **Life Member,** The Honor Society of Phi Kappa Phi, USA**.** Elected 1991.
14. **Honorary Member,** Pi Tau Sigma, Mechanical Engineering Honor Society, USA. Elected 1986.

Awards: Papers

1 Williams, C.B., Mistree, F. and Rosen, D.W., 2008, "A Functional Classification for the Conceptual Design of Layered Manufacturing Technologies," (P. Sanborn, Ed.), ASME Design for Manufacturing and Life Cycle, Conference, New York, New York. ASME DETC2008/DFMLC-49353.[56]

2 Panchal, J.H., Fernández, M.G., Paredis, C.J.J., Allen, J.K. and Mistree, F., 2004, "The Importance of Designing Design Processes in Product Life Cycle Management," (I.S. Fan Ed.), ASME Computers In Engineering Conference, Salt Lake City, Utah. ASME DETC2004/CIE-57742.[57]

3 Lyon, T.D., Shupe, J.A. and Mistree, F., 1982, "Computer-based Design Synthesis: An Approach to Problem Solving[58]," ASEE Frontiers in Education Conference Proceedings, University of South Carolina, Columbus, South Carolina, October 18-20, 1982, pp. 102-108.

4 Walter F. Atkinson Memorial Award, Royal Institution of Naval Architects, Sydney for paper titled The Cost-effective Computer-aided Design of Ship Structures (with O. F. Hughes), May 1977.

Awards: Teaching

1. 2001 Jack M. Zeigler, 'Woodruff School Outstanding Educator Award', Woodruff School of Mechanical Engineering, Georgia Tech, Atlanta, Georgia.

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55 https://ou.edu/research-norman/news-events/2020/new-study-finds-ou-research-well-cited-impactful

56 Best paper award for 2008 DFLC Conference.

57 Received Robert E. Fulton EIM Best Paper Award for 2004.

58 Honorable Mention, Education Research Methods Division of ASEE.

2. ASME Students, 'Distinguished Professor for 1993' George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, May 1993.
3. Mortar Board Inc., National Honor Society, 'Top Professor for 1987-88' from the Cullen College of Engineering, University of Houston, March 1988.
4. Teaching Excellence Award, Pi Tau Sigma Houston Sigma Zeta, Houston, Texas. November 17, 1984.
5. Mortar Board Inc., National Honor Society, one of three 'outstanding Professors for 1982-83' from the Cullen College of Engineering, University of Houston.

Awards: Academic

1 Third Award, 1974 National Engineering Design Competition, sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio (entry Ph.D. dissertation).
2 Moritz H. Jaehne Memorial Scholarship 1971-72, University of California, Berkeley, California.
3 Fourth Award, 1970 National Engineering Design Competition, sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio (entry M.S. thesis).
4 J.N. Tata Scholar, J.N. Tata Education Foundation, Bombay, India, 1968 to 1970.
5 Award for Best Undergraduate Thesis 1967-68, Indian Institute of Technology, Kharagpur, W. Bengal, India.
6 Award for General Proficiency 1962-63, Indian Institute of Technology, Kharagpur, W. Bengal, India.

Awards: Civic

1 Manijeh Phirozeshaw Dotiwala Memorial Kunashni Award (with Y. F. Mistree) for service to the Zoroastrian community in Houston, March 21, 1984.
2 Mayor of Oakland's Award of Merit in recognition of the contribution of an international student to the community, 1970-71. Was presented the Key to City of Oakland.

XI SCORE CARD

Doctoral, Masters and Bachelors (Honors with thesis) Students Graduated

	UNSW	UH	GT	OU	**Total**	**Since 2018**
PhD		8	20	8	36	5
MS	1	21	31	12	65	8
UG (Hons.)	10	9		2	21	2
Total	11	38	51	21	**122**	**15**

Number of PhDs graduated pursuing careers in academia: Since 1992 18. Since 2009 ..7. Since 2018 …5.

Google Scholar Citations on May 15, 2023

Google Scholar	All	Since 2018
Citations	16842	4269
h-index	60	29

From December 30, 2022 to January 1, 2023 there were 368 new citations
From January 4, 2021 to December 31, 2021 there were 1159 new citations.
From January 1, 2020 to December 31, 2020 there were 1612 new citations
From January 1, 2019 to January 8, 2020 there were 900 new citations
From December 27, 2018 to January 1, 2019 there were 1029 new citations
From December 31, 2017 to December 31, 2017 there were 1113 new citations
From December 31, 2016 to December 31, 2016 there were 669 new citations

Publications

		SINCE 1974	SINCE 2009 @ OU	Since 2018 @ OU
1	Research Monographs (5) + Books (2)	7	4	4
2	Chapters in books	28	7	3
3	Journal articles. Refereed.	169	63	35
4	Articles in Referred Conference Proceedings	200	100	34
5	Book reviews	2		
6	Edited conference proceedings	4		
7	Technical papers in conference proceedings. Abstract reviewed. Paper not reviewed.	111	4	2
9	Position papers/National reports	11	2	1
Total		**532**	**180**	**78**

Presentations

		SINCE 1974	SINCE 2009 @ OU	Since 2018
1	Key notes and plenaries	41	31	14
2	Professional seminars	232	93	38
3	Short courses / tutorials / workshops	29	16	2
4	Briefings	2		
Total		**304**	**140**	**54**