HANBO YANG

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EDUCATION

University of Science and Technology of China Hefei, China
Bachelor of Science in Atomic and Molecular Physics *Sep. 2019 to Jun. 2023*
- GPA: 3.5, 85/100, Sum Laude
- The 4th World Laureates Forum, 1 of 10 undergraduates in China nominated
- First Prize of Innovation Physics Experiment Competition in 2021
- Distinguished Student Scholarship in 2021
- Freshman Scholarship in 2019, top 10%

PROJECTS

Real-Time NLOS Imaging Oct. 2021 – Present
University of Science and Technology of China | Prof. Feihu Xu's Research Group *Hefei, China*
- Our group developed an iterative 3D deconvolution algorithm to obtain an approximate solution and the results made progress in terms of imaging distance. I am now searching for methods to display the image process in real-time.
- I built a ray tracing algorithm to simulate the whole image process. One solution I figured out is to interpolate the sampling points in data space to reduce the physical process. Furthermore, I came up with an algorithm that originated from the LIGHT-CONE TRANSFORM to predict the data space response and introduce 3D interpolation, which could make a difference to the quality of the image within a short time.

Optical Nanofiber Jul. 2022 – Present
Rutgers University | Prof. Xuejian Wu's Group *Newark, USA*
- Our group has achieved fabricating optical nanofibers with the excellent transmission, in order to build the first atom interferometer with the evanescent field around an optical nanofiber.
- I built the nanofiber fabrication system based on flame-brushing technology. I collected the laser transmission data and used Fast Fourier Transform (FFT) for spectral analysis to characterize the fabrication process. I designed a laser collimation system to measure the error of the motion stages, which raised the transmission from a typical rate of 60% to 97%, close to the best result of published researches. I verified the accuracy of our alignment by calculating the deviation of our motion stages from the position-velocity-time (PVT) files generated from our code.
- Following waveguide theory, I simulated the transmission modes of a laser beam in a nanofiber, which allows us to optimize the fiber shape design. With a review named *Protocol for fabricating optical nanofibers using a flame-brushing technique* being written, I am honored to get the credit of the second author.

MOT Simulation Aug. 2022 – Present
Rutgers University | Prof. Xuejian Wu's Group *Newark, USA*
- Our group aims to build a portable gradiometer with high sensitivity. For the sake of that, our gradiometer introduces a diamond-shaped magneto-optical trap (MOT) to capture 87Rb atoms and measure the gravity gradient.
- With an initial Maxwell-Boltzmann velocity distribution, I simulated the trajectory of atoms in our single laser beam MOT in Matlab, with spontaneous emission and Doppler cooling in consideration. I also simulated the trajectory of a traditional six-beam MOT and compared the results of the two MOTs.These simulations allow us to characterize the atom number and temperature of our MOT.

RESEARCH INTERESTS

Quantum optics, Optical precision measurement, Nonlinear optics, AMO physics
Single-Photon Imaging, NLOS Imaging, Quantum-inspired computational imaging

TECHNICAL SKILLS

Languages: English: Native Speaker Level
German: A2 level
Programming: C, MATLAB, LaTeX, Mathematica, COMSOL, Python