

Optical Engineering Qualification

- Thorough understanding and use of geometrical optics, aberration theory, lens design
Proficiency in Code V and Zemax OpticStudio
- Plenty experience in optics simulation, optical metrology, testing, imaging processing and system modeling
Develop an open source optics python module — opticspy
- Rich experience in lab, proficient in using several kinds of optics equipment: interferometers, oscilloscopes, spectrometers, lasers, power detectors, power meters, integral sphere, fiber cleaver, fusion splicing, PMT detectors, etc
- Plenty experience in programming, network application and software developing; very good at solving problems with program; proficiency in using Python, Matlab, C, doing data analysis and visualization
- Strong problem-solving and analytical skills. Enjoy working as a team member as well as independently.
Strong interpersonal skills. Self-motivation demonstrated in research and independent projects
- English and Chinese fluency, good German

Education, Honors and Awards

- 2014–2016 **University of Rochester --- expected May 2016** ROCHESTER, NY
The Institute of Optics—Master of Optics
- 2009–2013 **Beijing University of Posts and Telecommunications (BUPT)** BEIJING, CHINA
School of Information and Communication Engineering (SICE)
B.Eng of Communications Engineering (GPA: 3.7)
Scholarship (3 times) and Outstanding Student Leader (3 times)

Optics related Experience

- 2014–2016 **Opticspy --- Optics python module** <http://opticspy.org>
Opticspy is an opensource, easy-to-use, integrated python module for optics application
- Real ray tracing and primary lens design module (Optical system modeling, simulation and analysis)
 - Zernike polynomials methods (Surface description, surface fitting, interferogram, point spread function, MTF, RMS, etc) as well as orthonormal rectangular Zernike polynomials
 - Interferometers and testing methods (Phase shift interferometer, Twyman-Green and lateral shear interferometer based on either Zernike polynomials or Sedeil aberration, Hartmann test, etc)
 - Wave propagation methods (Fresnel and Fraunhofer diffraction for different aperture, Gauss beam, etc)
 - Aberration calculation methods
- 2015–2016 **Biomedical Spectroscopy Lab, The Institute of Optics** ROCHESTER, NY
Research assistant — Advisor Professor Andrew Berger
Research in integrated Raman and angular scattering microscopy system:
- Simulated part of the system and predicted organelle diameter distribution by a cell's angular scattering
 - Helped building system and system alignment
 - Used arduino platform integrating the electrical control of whole Raman and angular scattering microscopy system
- 2015 **Lens Design Projects** ROCHESTER, NY
Camera Lens, IR and UV system, Zoom Lens, tolerancing, etc:
- Designed a 8x VIS-SWIR zoom lens for police drone
 - Designed an IR video camera lens for gas leak detecting drone
 - Designed a UV to IR camera lens for criminal investigation
 - Designed several kinds of eyepiece, objective, landscape lens, doublets and triplets
 - Environmental analysis, thermal analysis and tolerancing analysis
- 2012–2014 **State Key Laboratory of Information Photonics and Optical Communications** BEIJING, CHINA
Research assistant
Research in free space optical communications:
- Research and experimental demonstration of ultraviolet (UV) communication in atmosphere with MIMO
 - Researched the atmosphere channel characteristics for Non Line of Sight (NLOS) UV communication
 - Built a high accuracy ultraviolet photon transmission model with Monte Carlo method
 - Proved feasibility of MIMO technology used in ultraviolet communication
- Research in optical fiber communications:
- Research in cascading filters to mitigate a fiber's combination of nonlinear and dispersion (oral presentation in Asia Communications and Photonics Conference (ACP))

Other Project Experience

- 2013 **Graduation Thesis (Awarded Excellent Graduation Thesis (top 5%))** BEIJING, CHINA
Research in underwater sensor network synchronization algorithm:
 - Built underwater acoustic sensor network simulation platform with Python
 - Researched the performance of different synchronization algorithms in underwater acoustic sensor network
- 2013-2014 **Beijing HaoHan Data Information Technology Co. Ltd** BEIJING, CHINA
Intern
 - Aided in building networking platform for different applications used inside company and wrote the application development instruction manual
 - Completed network data visualization with Javascript
 - Developed plug-in for network packet analyzer software "WireShake"
- 2012 **National Undergraduate Scientific and Technological Innovation Project** BEIJING, CHINA
Braille Display (*Team Leader and Main Designer*):
 - Designed braille display with brand new modularized structure helps blind people to read
 - Led a five people research team to design hardware, software and production process, accomplished prototype of braille display
- 2012 **Advanced Labs in Wireless Communication (Course Design)** BEIJING, CHINA
OFDM Simulation:
 - Simulated OFDM system with Matlab-SIMULINK
 - Implemented OFDM system synchronization algorithm
- 2011 **Practicum in Electronic Techniques** BEIJING, CHINA
Intelligent Line Tracking Car Based on Embedded System:
 - Designed the hardware circuit with trade-off for performance parameters and costs of chosen chip PIC16F877
 - Programmed for the embedded system with assembly language, reached line following function

Selected Optics Coursework

- 2014-2016 **Selected Courses** ROCHESTER, NY
Concentrated on Lens design, Instrument and Optical Metrology
 - Lens Design
 - Advanced Lens Design
 - Optics Materials, Fabrication and Testing
 - Instrumental Optics
 - Optics Laboratory (Fiber Laser, Electro-Optics TV, Acousto-Optics, Nd: YAG Laser, PIN Detector)
 - Fourier Optics
 - Geometrical Optics
 - Radiation and Detectors
 - Research in Optics

Conference Contributions and Publications

- 2013 **Applied Optics**
Dahai Han, Xing Fan, Kai Zhang, and Rui Zhu, "Research on multiple-scattering channel with Monte Carlo model in UV atmosphere communication," *Appl. Opt.* 52, 5516-5522 (2013)
- 2013 **Oral Presentation** BEIJING, CHINA
X. Fan, R. Zhu, and D. Han, "Cascading Filters Allying with the Residual Perturbation Noise Compensator for Compensating the Fiber Dispersion and Nonlinear Effect," in *Asia Communications and Photonics Conference 2013, OSA Technical Digest (online) (Optical Society of America, 2013), paper AF1D.2.*