# Shuyuan Guan (Used name: Jiafan Guan)

#### The University of Arizona – PhD in Optical Sciences Tucson, AZ Jun, 2022 United States - present • Core courses: Advanced Lens Design (A), etc. • Current GPA: In progresss Aug, 2021 **Washington University in St Louis** – *PhD in Imaging Science* St. Louis, MO - May, 2022 • Core courses: Mathematics of Imaging Science (A-), Biomedical Optics I Principle (A+), Biomedical United States *Optics II Imaging* (A+), *Computational method of Imaging Science* (A), etc. • Cumulative GPA: 3.93/4.0 Tucson, AZ Aug, 2019 **The University of Arizona** – *Master in Optical Sciences* United States - May, 2021 • Core courses: Diffraction and Interferometry (A+), Electromagnetic Waves (A+), Holography and Diffractive Optics (A+), Probability and Statistics in Optics (A+), etc. • Cumulative GPA: 3.87/4.0 Sep, 2015 Changchun University of Science and Technology – BA in Optical-Electronic Engineering Changchun China - Jun, 2019 6<sup>th</sup> ranked in Optical Engineering major in China (2020 Ministry of Education of China Ranking) Second Scholarships for 4 consecutive semesters: 2016 Fall, 2017 Spring, 2017 Fall, 2018 Spring • Core courses: Structured Programming for Scientist & Engineers (A+), Quantum Mechanics (A+), Physical Optics (A+), Principles of Lasers (A+), Math Methods of Physics I (A+), Atomic Physics (A+) • Cumulative GPA: 3.98/5.00 Delaware State University – Exchange Senior Year Dover, DE Aug, 2018 United States - May, 2019 • Member of the Dean's List for the 2018 Fall and 2019 Spring Semester • Cumulative GPA 3.87/4.00

## **PROJECTS & LAB EXPERIENCE**

Jun, 2022 - Dec, 2022	<ul> <li>Chromatic Confocal Microscopy – <i>Research Rotation</i></li> <li>Synchronized the Galvo scanner and line sensor using LabVIEW to build a chromatic confocal system.</li> <li>Evaluated system performance of the chromatic confocal system using an achromatic objective and z-axis translation stage to achieve depth porcine esophagus imaging.</li> </ul>
Oct, 2022 - Dec, 2022	<ul> <li>Optical Coherence Tomography Dispersion Compensation – <i>Research Rotation</i></li> <li>Performed background subtraction and digital dispersion compensation on a B-scan fingertip image from a Swept-source OCT system by using Python.</li> </ul>
Jan, 2022 - present	Point Spread Function Engineering – Research Rotation
	• Simulated the imaging system of a single molecule orientation and localization microscopy (SMOLM) with both Python and MATLAB
	<ul> <li>Optimized the Cramér–Rao bound of the imaging system and achieved improved precision performance on both the orientation and localization estimation of single molecules</li> </ul>
Aug, 2021 - Dec, 2021	Wavefront Shaping – Research Rotation
	• Realized phase modulation of using the intensity modulation based Digital Micromirror Device by adding phase mask on a carrier wave and do spatial filtering at the Fourier plane
	Achieved synchronization between the DMD and COMS camera by using LabVIEW and function generator
	• Calculated the Transfer Matrix of the optical system and confirmed optical focusing at the distal side of a multimode fiber
Jan, 2021 - May, 2021	Dual Phase Modulation – Research Assistant
	Simulated a Phase Light Modulator (PLM) based optical system by using Rsoft
	Realized optically enhancement of the diffraction efficiency of the PLM beam steering

· Confirmed doubled diffraction efficiency of the PLM beam steering system at 1550nm illumination

## EDUCATION

#### Sep, 2020 Image Analysis – Individual Project, Grade: A+

- Dec, 2020 Simulated imaging system and wave propagation with MATLAB
  - · Conducted image processing, image restoration, statistical integration and Bayesian estimation

#### Apr, 2020 Holographic Beam Steering – Research Assistant

- Dec, 2020 Generated CGH patterns for high diffraction efficiency continuous beam steering experiment
  - · Encoded the grayscale CGH videos to RGB frame for high frequency beam steering purpose

• Simulated the diffraction efficiency on different diffraction orders with Rsoft and Mathematica, computationally selected quasi-linear phase mapping based on the simulation

• Experimentally determined the main factors affecting the diffraction efficiency of the Phase Light Modulator by using an interferometer, and optically further increased the diffraction efficiency for infrared light

#### Nov, 2019 Diffractive Beam Steering – Project Leader

- Nov, 2020 Achieved a 48 degrees full field of view diffractive beam steering system by utilizing a mass-produced digital micromirror device and a short pulse laser
  - · Evaluated the baseline and long-term performance of the DMD based beam steering system

#### Sep, 2019 Telecentric System Design – Group Leader, Grade: A+

- Nov, 2019 • Designed and manufactured a Telecentric Imaging System by leading 6 group members

• Realized the high resolving power and corrected the aberration of the telecentric microscope objective by adding doublet to the system

### WORK EXPERIENCE

Aug, 2020 - Dec, 2020	<ul> <li>University of Arizona – Teaching Assistant of Optical Design and Instrumentation I</li> <li>Answered academic questions about mirror and prism system, telescope system, illumination system, and photographic system in remote office hours and in emails</li> <li>Graded 8 homework and gave back feedback to students every week</li> </ul>	Tucson, AZ United States
Jan, 2020 - Jun, 2020	<ul> <li>University of Arizona – Teaching Assistant of Optical Design</li> <li>Graded 9 homework and give back feedback to students every week</li> <li>Evaluated 6 CODE V based optical design projects, including Landscape Lens, Dialyte Lens, Double Gauss Re-optimization, etc.</li> <li>Assisted students to review and solve problems during office hours and recitation classes</li> </ul>	Tucson, AZ United States

#### PUBLICATIONS

Aug, 2022	Optical Enhancement of Diffraction Efficiency of Texas Instruments Phase Light Modulator for Beam Steering in
	Near Infrared, Journal of Micromachines
	Authors: Jiafan Guan, Zhipeng Dong, Xianyue Deng and Yuzuru Takashima.
Mar, 2021	Stability of diffractive beam steering by a Digital Micromirror Device, 2021 SPIE Photonics West
	Authors: Jiafan Guan <sup>1</sup> , Eric Evan <sup>2</sup> , Choi Heejoo <sup>3</sup> , Yuzuru Takashima <sup>4</sup> .
Aug, 2021	Analysis of diffraction efficiency of TI-PLM and its potential in beam steering, ODS 2021: Industrial Optical Devices
	and Systems
	Authors: Chuan Luo, Jiafan Guan, Xianyue Deng, Yuzuru Takashima

#### **RELEVANT SKILLS**

**Expert** • Zemax, LabVIEW, Image J, MATLAB, Light Crafter, Rsoft

Proficient • Python, CODE V, Raspberry Pi, SOLIDWORKS, Octave, VirtualLab