Ruyi ZHAO

ruyi-zhao@g.ecc.u-tokyo.ac.jp | 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan

EDUCATION

The University of Tokyo (UTokyo) **Tokyo | Sep. 2023 – July. 2025 (expected)**
Master of International Bioengineering
- Core modules: Overview of Bioimaging, Advanced Biodevices, Advanced Biomaterials, etc.
- Research areas: Cell and shockwave interaction, Ultrafast imaging and Imaging flow cytometry

Beijing Institute of Technology (BIT) **Beijing | Sep. 2019 – Jul. 2023**
Bachelor of Opto-Electronics Information Science and Engineering
- GPA: 3.7/4, graduated with graduation project rated as 'Excellent'
- Research areas: Hyperspectral compressive imaging and Deep learning

National Institute of Scientific Research, Université du Québec (INRS) **Montreal | Aug. 2022 - Nov. 2022**
Mitacs Globalink Research Internship
- Research area: CUP (Compressed ultrafast photography)

RESEARCH EXPERIENCE

Postgraduate Graduation Project: Imaging Flow Cytometry Based on Ultrafast Imaging of Acoustic Cellular Interaction
Independent Researcher **Tokyo | Sep. 2023 - now**
Supervised by Pro. Keiichi Nakagawa, Laboratory of Biomedical Precision Engineering Lab (BMPE), UTokyo
- Proposed DIC-STAMP (Differential Interference Contrast-STAMP) to enhance shockwave edge detection for detailed wavefront analysis, with a medium-term goal of three months to examine laser-induced shockwave-cell interactions. (In progress)
- Proposed a TSMD module for a compact STAMP, enabling independent control of pulse trains with adjustable intervals (0.1ns to 3ns) and no wavelength overlap, while eliminating wavelength mismatch between SMD and TMD, fully removing crosstalk. (In collaboration)
- Improved the STAMP system by utilizing a spectral shuttle as the TMD and a slicing mirror with a 4f system as the SMD, significantly reducing crosstalk and increasing the SNR from 5.78 dB to 11.59 dB, allowing more detailed analysis of shockwave-cell interactions.
- Integrated STAMP with Nikon Ti2-U microscope, enhancing imaging stability and versatility with DIC/fluorescence, and applied a co-axial configuration for stable laser-induced shockwave generation, enabling future integration with flow cytometry systems.

Undergraduate Graduation Project: Research on Deep Learning based Spectral Compressive Imaging Technology
Independent Researcher **Beijing | Sep. 2022 - Jun. 2023**
Supervised by Pro. Ke Jun, School of Optics and Photonics, BIT
- Implemented a Tranformer-based hyperspectral reconstruction algorithm to overcome issues of the existing neural networks not giving full play to the role of masks and capturing the non-local long-distance dependence in the CASSI hyperspectral reconstruction technique.
- Achieved an average SSIM of 92% and PSNR of 34.22 dB on the KAIST dataset with 10 randomly selected 2D measurements (256×310).

Mitacs Globalink Research Internship: Single-shot Compressed Optical-streaking Ultra-high-speed Photography
Research Assistant with a Certificate of Completion **Montreal | Aug. 2022 - Nov. 2022**
Supervised by Pro. Jinyang Liang, Laboratory of Applied Computational Imaging (LACI), INRS
- Independently constructed a compact Single-shot Compressive Optical-Streaking Ultra-high-speed Photography (COSUP) system, aimed at RGB, low-light, and miniaturized ultrafast imaging, and serving as a foundational platform for subsequent experiments by PhD students.

OTHER EXPERIENCE

Bioengineering Summer Experiment
Trainee **UTokyo | Sep. 2024 - Nov. 2024**
- Synthesized and PEG-modified MEH-PPV fluorescent polymer dots (Pdots), and measured their size with an electron microscope.
- Cultured and incubated cells with PEG-modified Pdots, and conducted fluorescence imaging using a confocal microscope.

Engineering Summer Education Program(ESEP-G)
Research Mentor **UTokyo | Jun. 2024 - Aug. 2024**
- Mentored an undergraduate student from Oxford University on the principles, construction, and operation of STAMP, along with key optical experiment techniques, such as the use of lasers, assembly of optical components, and operation of various lab instruments.
- Guided the student in developing and refining the PowerPoint presentation for the lab meeting to enhance overall presentation quality.

The OBS Broadcast (Olympic Broadcasting Services) Training Programme, Beijing 2022 Winter Olympic
Venue Production Assistant **Zhangjiakou | Jan. 2022 - Feb. 2022**
- Guided international photojournalists to pre-set spots on the ski centre circuit and assisted them with live broadcasts.
- Translated between OBS foreign staff and Chinese officials/workers to ensure effective communication and seamless collaboration.

SELECTED AWARDS/HONOURS

- Granted the University of Tokyo Fellowship in Oct. 2023 as top 2% of international postgraduates.
- Attained the 2022 Mitacs Globalink Research Award from the China Scholarship Council in Aug. 2022.
- Won the First Prize of the Contemporary Undergraduate Mathematical Contest in Modeling, with a 5% award ratio.
- Three-time recipient of the College Academic Scholarship, XUTELI School, BIT, between 2020 and 2021.
- Awarded the BIT Freshman Entrance Scholarship for outstanding performance in China's standardized college entrance exam, Oct. 2019.

ADDITIONAL INFORMATION

- **Technical Skills:** SolidWorks, AutoCAD, ImageJ, Zemax, MATLAB, Python, Pytorch, ChatGPT, Microsoft Office
- **Languages:** Mandarin (Native), English (Fluent), Japanese (Basic)
- **Interests:** Cooking, Riding, Hiking