Chaoying Gu | https://arianagu.github.io/

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EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY   Berkeley, CA, US   08/2022-present
PhD student in Electrical Engineering, major in signal processing, GPA: **4.0**/4.0
Research focus: Signal processing, image reconstruction and inverse problems solving in computational imaging.
Expected date of completion: 05/2027

PEKING UNIVERSITY   Beijing, China   09/2018-07/2022
BS in Electronic and Information Engineering, Overall GPA: **3.776**/ 4.000 (1/50 in EIE Dept.)
Awards and Honors
    AEON scholarship   01/2021
    Merit Student, Peking University   09/2019&09/2020&09/2021

PUBLICATIONS

Leyla Kabuli, **Chaoying Gu**, Laura Waller. "Replica Artifacts in Phase Mask-Based Lensless Imaging Systems."
Computational Optical Sensing and Imaging. Optica Publishing Group, 2023.
- Improved the diffuser-based lensless imaging by systematically studying structured artifacts in reconstruction.

Chaoying Gu, Talha Sultan, Khadijeh Masumnia-Bisheh, Laura Waller, Andreas Velten. "Fast Non-line-of-sight Imaging with Non-planar Relay Surfaces. " *IEEE International Conference on Computational Photography (ICCP).* IEEE, 2023.
- Proposed a novel computational method that effectively performs 3D diffraction propagation.
- Achieved orders of magnitude better complexity compared to state-of-the-art algorithms without quality degradation, validated on experimental data.

Kevin C. Zhou, **Chaoying Gu**, Grace Jiang, Nicholas Antipa, Roarke W. Horstmeyer, Laura Waller. "High-throughput computational microscopy with diffractive multiplexing across a gigapixel sensor array." *Computational Optical Imaging and Artificial Intelligence in Biomedical Sciences*. SPIE, 2024.
- Implemented a patch-based deconvolution method for fast and memory-efficient reconstruction for high-throughput multiplexed imaging that involves deconvolving a diffraction pattern.

Chaoying Gu, Antoine Islegen-Wojdyla, Markus Benk, Kenneth A. Goldberg, Laura Waller. "Towards Full Field-of-View Fourier Ptychography for Extreme Ultraviolet Microscope." *IEEE Conference on Computational Imaging Using Synthetic Apertures (CISA).* IEEE, 2024.
- Extensively evaluated the reconstruction quality of existing algorithm s under EUV microscope aberration.
- Achieved a 36-fold increase in the usable field-of-view from the nominal 5×5 µm² diffraction-limited area.

RESEARCH PROJECTS

Enhanced EUV Mask Imaging Using Fourier Ptychographic Microscopy (FPM)
- Utilized binary pseudo-random patterns (BPRP) and compared various FPM reconstruction algorithms using both simulated and experimental data from the SHARP EUV microscope at Lawrence Berkeley National Laboratory.
- Demonstrated robust performance in reconstructing elliptical pupils and attenuated phase shift masks, validating FPM as a candidate for advanced EUV mask imaging applications.

Neural Network-Accelerated Reconstruction for High-Spatiotemporal-Throughput Video Microscopy of Freely Moving Organisms
- Developed an end-to-end neural network to accelerate optimization-based reconstruction, employing a patch-based strategy to adapt U-Net for gigapixel image reconstruction with diffractive multiplexing across a sensor array.

EXPERIENCE

Google APAC Software Product Sprint   6/2020
- Implemented a personalized social application based on Django, Django REST, MySQL and Dart.
- Recognized as the top contributing participant by group members.

TEACHING

- Teaching assistant, *Analysis and Design of Analog Circuits, Peking University*   9/2021-6/2022

TECHNICAL SKILLS

Programming: Python (PyTorch), MATLAB, C++, C#
Software: LaTeX, HTML, Origin