

# Yujin Lee

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## Education

### Yonsei University

B.S. in Electrical and Electronic Engineering | GPA: 3.6 / 4.0

Mar. 2019 – Present

Seoul, Korea

## Publications

- [P1] **Spatially-coded Fourier ptychography: flexible and detachable coded thin films for quantitative phase imaging with uniform phase transfer characteristics** [[arXiv](#)]  
R. Wang<sup>†</sup>, L. Yang<sup>†</sup>, **Y. Lee**<sup>†</sup>, ..., G. Zheng, *Currently Under Review (Advanced Optical Materials)* (†co-first authors)
- [P2] **Rolling Shutter Speckle Plethysmography for Quantitative Cardiovascular Monitoring**  
**Y. Lee**<sup>†</sup>, S. Byun<sup>†</sup>, C. Y. Yi, J. Jung, S. A. Lee, *Currently Under Review (Biomedical Optics Express)* (†co-first authors)
- [P3] **Improvements and Validation of Spatiotemporal Speckle Correlation Model for Rolling Shutter Speckle Imaging**  
C. Y. Yi, S. Byun, **Y. Lee**, S. A. Lee, *Currently Under Review (Biomedical Optics Express)*
- [P4] **Structured modulation multi-height microscopy for super-resolution imaging** [[paper](#)]  
L. Yang, **Y. Lee**, R. Wang, P. Song, D. Candela, T. Wang, ..., X. Shao, *Optics Express*, 31, 35003-35015, 2023
- [P5] **Lensless polarization camera for single-shot full-Stokes imaging** [[paper](#)]  
N. Baek, **Y. Lee**, T. Kim, J. Jung, S. A. Lee, *APL Photonics*, 7(11), p.116107, 2022
- [P6] **Fabrication of Integrated Lensless Cameras via UV-Imprint Lithography** [[paper](#)]  
**Y. Lee**<sup>†</sup>, H. Chae<sup>†</sup>, K. C. Lee, N. Baek, T. Kim, J. Jung, S. A. Lee, *IEEE Photonics Journal*, 14(2), p.7, 2022  
(†co-first authors, *Selected as an Editorial Board Top Article*)

## Conference Talks / Posters [Selected]

- [C1] **3D Lensless camera for extended depth range with multiple point spread functions**  
T. Kim, **Y. Lee**, J. Jung, K. C. Lee, S. A. Lee, *SPIE Advanced Biophotonics Conference*, Jeju, Korea, November 2023 (Poster)
- [C2] **Rolling Shutter Speckle Plethysmography for Pulsatile Blood Flow Analysis** [[video](#)]  
**Y. Lee**, S. Byun, C. Yi, J. Jung, S. A. Lee, *Computational Optical Sensing and Imaging*, Boston, MA, USA, August 2023  
(Oral, Nominated as one of the best student paper finalists)
- [C3] **Jointly Optimized Lensless Imaging System with Trainable Phase Mask for Task-specific Imaging**  
J. Jung, **Y. Lee**, S. A. Lee, *International Conference on Electronics, Information and Communication*, Singapore, Shangri La, February 2023 (Poster, Awarded a best poster prize)
- [C4] **Integral Lensless Imaging with Improved Depth-of-Field by Using Phase Retrieval**  
**Y. Lee**, J. Jung, K. C. Lee, S. A. Lee, *Advanced Biophotonics Conference*, Pohang, Korea, November 2022 (Poster)
- [C5] **Fabrication of Integrated Lensless Cameras via UV-Imprint Lithography** [[video](#)]  
**Y. Lee**, H. Chae, K. C. Lee, N. Baek, T. Kim, J. Jung, S. A. Lee, *Imaging and Applied Optics Congress*, Vancouver, BC, Canada, July 2022 (Oral)
- [C6] **Single-Shot Full-Stokes Lensless Camera**  
N. Baek, **Y. Lee**, T. Kim, J. Jung, S. A. Lee, *SPIE Photonics West*, San Francisco, CA, USA, January 2022 (Oral)

## Research Experiences

### Smart Imaging Lab, University of Connecticut

Jun 2023 – Aug 2023

Supervisor: Professor Guoan Zheng

CT, USA

- Simulated spatially-coded Fourier Ptychography with the diffuser placed on the sensor to reconstruct low spatial frequencies. [P1]

- Implemented a ptychographic phase retrieval algorithm to reconstruct the wavefront of complex objects at multiple heights. [P2]

## Optical Imaging Systems Lab, Yonsei University

Aug 2021 – Present

Supervisor: Professor Seung Ah Lee

Seoul, South Korea

- Developed a method to enhance depth-of-field by optimizing a phase mask using multiple PSF patterns with varying working distances. [C1, C3]
- Developed a rolling-shutter speckle plethysmography to extract blood flow dynamic waveforms by applying single-shot temporal speckle correlation. [P2, P3, C2]
- Implemented CycleGAN model to generate virtually stained histology images from phase-only QPI microscopy datasets.
- Performed ADMM-based reconstruction of polarization intensity images using a lensless computational camera with a polarization-encoded aperture. [P5, C6]
- Engineered an on-chip, open-faced lensless camera using UV-imprint lithography method [P6, C5]
- Engaged in Advanced Study Sessions:  
*Deep Learning Study (10-week Computer Vision paper review and implementation),*  
*Computational Optics Study (4-week Fourier Ptychography reconstruction and regularized reconstruction implementation)*

## Teaching and Services

- **Reviewer** | Biomedical Optics Express (2023), Applied Optics (2023)
- **Teaching Assistant** | Yonsei University Electrical Engineering Department  
Engineering Information Processing [ENG1108] (2023)
- **Peer Tutor** | Yonsei Computer Club, Electrical Engineering Honor Society  
Data Structure (2021), Deep Learning CNN (2022), Basic Circuit Theory (2022)
- **EE-Festival Coding Judge** | Yonsei University Electrical Engineering Department  
Judged coding competition on Hungarian Algorithm implementation at EE-Festival (2022)
- **Interpreter** | Ministry of the Interior and Safety, South Korea  
Interpreted for ambassadors during National Independence Day and Foundation Day ceremonies (2023)

## Patents

- Methods for Manufacturing Phase Masks and Lensless Camera Module  
S. A. Lee, H. Chae, **Y. Lee**, K. C. Lee, N. Baek, T. Kim, J. Jung, *US Patent 18/168,887*
- Polarization camera and polarization image acquisition method for obtaining full Stokes parameter  
S. A. Lee, N. Baek, T. Kim, J. Jung, **Y. Lee**, *KR 10-2022-0021932*

## Skills

- Software | Fusion 360, Keyshot, Adobe Illustrator
- Hardware | FPGA, Arduino, Raspberry Pi
- Programming | Python, Matlab, C/C++, PyTorch
- Language | Korean (Native), English (Fluent)

## Award and Scholarships

- Yonsei Student Startup Scholarship | Custom PCB Machine, Yonsei Enterprise Support Foundation (2022)
- GROW-UP Startup Team | Sentiment Analysis Diary App, Yonsei Enterprise Support Foundation (2021)
- Social Innovation Activity Scholarship | Y-valley Operation Plan, Higher Education Innovation Center (2019)

## Professional memberships

- Optical Synthetic Aperture Techniques (OSAT) Study Group of IEEE standard association member (2023)
- OPTICA student member (2022, 2023)

## Leadership Activities

- **Vice President** | Electrical Engineering Honor Society (2022)
- **President** | Yonsei Computer Club (2021)
- **President** | YonHee Startups (2019)