Yujin (Haley) Lee

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Education

Yonsei University Mar. 2019 – Present

B.S. in Electrical and Electronic Engineering | GPA: 3.6 / 4.0 *Seoul, Korea*

Publications

[P1] **Ptycho-endoscopy on a lensless ultrathin fiber bundle tip** [arXiv]
P. Song, R. Wang, L. Loetgering, J. Liu, P. Vouras, **Y. Lee**, ..., G. Zheng, *Currently Under Review*

[P2] **Spatially-coded Fourier ptychography: flexible and detachable coded thin films for quantitative phase imaging with uniform phase transfer characteristics** [paper]
R. Wang[†], L. Yang[†], **Y. Lee**[†], ..., G. Zheng, *Advanced Optical Materials*, 12(5), 2303028, 2024 (†co-first authors)

[P3] **Rolling Shutter Speckle Plethysmography for Quantitative Cardiovascular Monitoring**
Y. Lee[†], S. Byun[†], C. Y. Yi, J. Jung, S. A. Lee, *Currently Under Review* (*Biomedical Optics Express*) (†co-first authors)

[P4] **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*)

[P5] **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

[P6] **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

[P7] **Fabrication of Integrated Lensless Cameras via UV-Imprint Lithography** [paper]
Y. Lee[†], H. Chae[†], 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 Patant 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
- Programming | Python, Matlab, C/C++, PyTorch
- Hardware | FPGA, Arduino, Raspberry Pi
- 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)