Baekcheon Seong

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Education

Yonsei University, Mechanical Engineering — Seoul, Republic of Korea, Mar 2018 – Aug 2023
- Advisor: Prof. Chulmin Joo, Computational Imaging & Instrumentation Lab (CII)

Hongik University, Mechanical Engineering — Seoul, Republic of Korea, Mar 2014 – Feb 2018

Experience

Koh Young Technology, Optical Engineer / Optical Engineering Team Manager — Yongin, Republic of Korea, July 2023 – present, 2 years 8 months
Lead R&D on computational imaging and interferometry-based inspection for semiconductor and industrial applications. Collaborate with AIT (Austria) and Fraunhofer IPM (Germany).
- Inline Photometry-Stereo Inspection (AOI-AXIA): Led development of computational imaging system; built depth reconstruction and calibration pipelines (Python); managing joint research with AIT
- Interferometry-Based Inspection (ZenStar): Contributed to synthetic-wavelength holography imaging; optimized phase-unwrapping and noise-handling algorithms; joint research with Fraunhofer IPM

Yonsei University, Department of Mechanical Engineering, Part-time Lecturer — Seoul, Republic of Korea, Sept 2022 – Feb 2023, 6 months
Biomedical Optical Imaging — delivered lectures on optical science and engineering for biomedical imaging; reviewed state-of-the-art publications and instrumentation.

Computational Imaging & Instrumentation Lab (CII), Yonsei University, Graduate Researcher — Seoul, Republic of Korea, Mar 2018 – Aug 2023, 5 years 6 months
Ph.D. research under Prof. Chulmin Joo. Depth-of-field extension microscopy, computational imaging, Fourier ptychography, OCT, wavefront coding. Industry-funded projects (Koh Young, AUROUS, KIAT, KMDF, Hyundai NGV).
- E2E-BPF microscope: jointly optimized binary phase filter and deconvolution network; 15.5× extended DoF (Light: Science & Applications, 2023)
- Untrained deep learning-based differential phase-contrast microscopy (Optics Letters, 2023)
- Light-sheet fluorescence microscopy, topology optimization for phase filters, OCT-based film inspection

Publications

E2E-BPF microscope: extended depth-of-field microscopy using learning-based implementation of binary phase filter and image deconvolution
Jointly optimized binary phase filter and deconvolution network for 15.5× extended DoF imaging.
Baekcheon Seong, Woovin Kim, Younghun Kim, Jong-Seok Lee, Jeonghoon Yoo, Chulmin Joo
doi.org/10.1038/s41377-023-01300-5

Untrained deep learning-based differential phase-contrast microscopy
Baekcheon Seong, Ingyoung Kim, Taegyun Moon, Malith Ranathunga, Daesuk Kim, Chulmin Joo
doi.org/10.1364/OL.493391

Light sheet fluorescence microscopy using axi-symmetric binary phase filters
Baekcheon Seong, Suho Ryu, Chan-wool Lee, Min Yong Ahn, Woo Taek Kim, Kwang-Min Choe, Chulmin Joo
doi.org/10.1364/BOE.394841

Patents

Apparatus for Three-Dimensional Shape Measurement: US Patent Application 18/846,218, 2025

Method for Designing Binary Phase Filter Extending Depth of Field and Image Reconstruction: US Patent Application 18/491,303, 2024

Tomography Imaging System for Transparent Material Composite Thin Film: US Patent 11,846,587, 2023

Skills

Optical Systems

Simulation & Tools

Integration & R&D

Languages

Korean
Native

English
Business fluent