Curriculum Vitae

Name:	**Jeonggeun Song**, Ph. D (송 정 근/宋 呈 根)
Phone:	+82-10-6483-0527
E-mail:	han1801j@kaist.ac.kr / han102103@gmail.com
Gender	Male
Date of Birth:	February 9, 1996
Place of Birth:	Daejeon, South Korea
Nationality:	Republic of Korea
Military Service	Technical Research Personnel (Mar 2021 ~ Feb 2024)

PROFESSIONAL EXPERIENCE

Post Doc.
Mar. 2025 ~

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
Department of Mechanical Engineering
- Advisor: Prof. Hongki Yoo
- Research:
  Two-photon oblique light sheet microscopy
  Optical system design and optimization
  Non-destructive monitoring of photolithography using autofluorescence imaging

MIT visiting student
Mar. 2023 ~May.2023

MIT Laser Biomedical Research Center, MA, USA
Research: Development of compact swept-source Raman spectroscopy

Intern
Apr. 2018 ~May. 2018

TOMOCUBE, Inc. Daejeon, South Korea.
Role: Biomedical imaging system study and biological sample image processing.

Undergraduate Intern
Dec. 2016 ~Feb. 2017

Neuro-Rehabilitation Engineering Lab, Daejeon, South Korea.
Research: Development of nerve rehabilitation devices for fingers

EDUCATION

Ph.D.
Mar. 2021 ~Feb. 2025

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
Department of Mechanical Engineering
- Dissertation: *Development of single-objective two-photon oblique light sheet microscopy using a low repetition rate light source*
- Advisor: Prof. Hongki Yoo
- GPA: 3.86/4.3
- Committee: Prof. Jeongmin Kim, Prof. Young-Gyun Park, Prof. Jessie S. Jeon, Prof. Jennifer H. Shin

MS.
Mar. 2019 ~Feb. 2021

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea
Department of Mechanical Engineering
- Thesis: *Precision-enhanced two photon fluorescence lifetime imaging microscopy with controlled repetition rate*
- Advisor: Prof. Hongki Yoo
- GPA: 3.98/4.30
- Committee: Prof. Wang-Yuhl Oh, Prof. Jin Won Kim

B.S. Mar. 2014 ~Feb. 2019	**Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, South Korea Department of Mechanical Engineering - GPA: 3.60/4.30 - Advisor: Prof. Hyung-Soon Park
Mar. 2012 ~Feb. 2014	Changwon science high School, Changwon, Korea

RESEARCH AREA

- Optical imaging system design and optimization
- Signal and image processing
- Femto-second pulse laser
- Confocal microscopy
- Fluorescence lifetime imaging microscopy (FLIM)
- Optical coherence tomography (OCT)
- Two-photon fluorescence imaging microscopy (TPM)
- Light sheet microscopy (LSM)
- Raman spectroscopy
- Photolithography monitoring

JOURNAL PUBLICATIONS (SCI & SCIE)

1. **Song J**, Choi J, Kwon S, Chang WS, Yoo H. Autofluorescence imaging of photolithography exposure patterns for non-destructive monitoring. *In preparation*
2. **Song J**, Nam HS, Lee WJ, Park HM, Park YG, Yoo H. Development of single-objective two-photon oblique light sheet microscopy using a low repetition rate light source. *In preparation*
3. Lee W, Jang M A, Nam HY, **Song J**, Choi J, Song JW, Seok JY, Kim P, Kim JW, Yoo H. Self-supervised denoising of dynamic fluorescence images via temporal gradient-empowered deep learning. PhotoniX, 2025; 6.1:1-25
4. **Song J**, Peter T. C So, Yoo H, Kang JW. Swept-source Raman spectroscopy of chemical and biological materials. *Journal of Biomedical Optics 2024;29.S2:S22703-S22703*
5. **Song J**, Kang J, Kang U, Nam HS, Kim HJ, Kim RH, Kim JW, Yoo H. SNR enhanced high-speed two-photon microscopy using a pulse picker and time gating detection. *Scientific Reports 2023; 13.1:14244*

INTERNATIONAL CONFERENCE

1. **Song J**, Lee W, Nam HS, Park H, Park YG, Yoo H. Two-photon oblique light sheet microscopy with enhanced SNR using low repetition rate light source. SPIE ABC, Hamdeok Sono Bell, Korea, 2025
2. **Song J**, Choi J, Kwon S, Chang WS, Yoo H. Non-destructive monitoring of photolithography exposure patterns using autofluorescence imaging. Nano Korea, KINTEX, Korea, 2025
3. **Song J**, Lee W, Nam HS, Park H, Park YG, Yoo H. SNR-enhanced single-objective two-photon oblique light sheet microscopy with low repetition rate light source. European Conferences on Biomedical Optics (ECBO), Munchen, Germany, 2025
4. **Song J**, Peter T. C So, Yoo H, Kang JW. Swept source Raman spectroscopy of chemical and biological materials. SPIE Photonics West, San Francisco, CA, USA, 2024
5. **Song J**. Kang J, Nam HS, Kang U, Kim HJ, Kim JW, Yoo H. Repetition rate control for high-speed two-photon fluorescence lifetime imaging microscopy. SPIE Photonics West, San Francisco, CA, USA, 2023
6. Kim YH, Kim JH, **Song J**, Kim RH, Nam HS, Song JW, Kim HJ, Ahn JW, Park K, Kim JW, Yoo H. intravascular photodynamic therapy guided by optical coherence tomography-near infrared fluorescence imaging for precise diagnosis and treatment of atherosclerosis. SPIE Photonics West, San Francisco, CA, USA, 2023

7. **Song J**, Kang J, Nam HS, Kang U, Kim HJ, Kim JW, Yoo H. High-sensitive Two-photon fluorescence lifetime imaging microscopy with optimal repetition rate. Advanced Biophotonics Conferecnt-SPIE, Busan, Korea, 2021

8. **Song J**. Kang J, Nam HS, Kang U, Kim HJ, Kim JW, Yoo H. Development of high speed and precision enhanced Two-photon Fluorescence lifetime imaging microscopy with optimal repetition rate. The joint Conference of the IBEC and ICBHI, Virtual conference, 2021

9. Song JW, Kim YH, Ahn JW, Nam HS, Kim JH, Kim HJ, Kim RH, Kang DO, Park YH, **Song J**, Park K, Yoo H, Kim JW. Intravascular targeted photoactivation guided by optical coherence tomography-near infrared fluorescence (OCT-NIRF) imaging promotes stabilization of atherosclerotic plaques. AHA Scientific Session, Virtual Conference, 2021

DOMESTIC CONFERENCE

1. **송정근**, 최진수, 권순용, 장원석, 유홍기. 자가형광 이미징을 이용한 포토리소그래피 노광 패턴의 비파괴 모니터링. 한국기계가공학회 2025 추계학술대회

2. **송정근**, 이우진, 남형수, 박하민, 박영균, 유홍기. 저반복률 광원을 이용한 SNR 향상 단일 대물렌즈 이광자 사선 광시트 현미경 개발. 대한의용생체공학회 2025 년도 추계학술대회

3. **송정근**, 강주형, 남형수, 강운교, 김현정, 유홍기. 고속 및 광표백 감소 이미징을 위한 최적 반복률 이광자 자극 형광 수명 현미경. 대한의용생체공학회 2022 년도 춘계학술대회

RESEARCH PROJECTS

Mar. 2019 ~Feb. 2021	**Development of Swept-Source Optical Coherence Tomography (SS-OCT)** - Role: Project engineer - Area: SS-OCT system development, medical optical system cart design,
Mar. 2019 ~Feb. 2021	**Precision enhancement of two-photon fluorescence lifetime microscopy with controlled repetition rate** - Role: Project leader - Area: Imaging system design and development, image and fluorescence signal processing & analysis
Mar. 2023 ~May. 2023	**Development of compact Raman spectroscopy using swept-source laser** - Role: Project leader - Area: Raman spectroscopy system development, signal analysis & processing
Mar. 2021 ~Feb. 2026	**Development of high-speed and high-efficiency single objective two-photon oblique light sheet microscopy using low repetition rate light source** - Role: Project leader - Area: 3D imaging system design and development, optical system optimization
Mar. 2025 ~	**Non-Destructive Monitoring of Photolithography Exposure Pattern** - Role: Project leader - Area: Autofluorescence imaging, fluorescence image processing & analysis

HONORS AND AWARDS

2021.	Best Poster Award (International Biomedical Engineering Conference 2021)	The Korean Society of Medical & Biological Engineering

EXPERIENCED SKILLS

- MATLAB Programming
- Solidworks
- Labview
- Zemax (optical system simulation)