Jongpil JEONG [ID]

Master student
Dept. of Creative Informatics at CSSE
Kyushu Institute of Technology
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EDUCATION

Kyushu Institute of Technology   Iizuka, Fukuoka, Japan
Master of Engineering in Dept. of Creative Informatics   *Apr. 2024 — Mar. 2026(Expected)*
Graduate School of Computer Science and Systems Engineering   Cumulative GPA:**3.02/4.00**
Thesis:*"Visibility Restoration under Harsh Conditions using Adaptive Removal via Mask for Scatter (ARMS)"*
Advisor: Prof. Min-Chul Lee

Dong-A University   Busan, Korea
Bachelor of Engineering in Dept. of Electronics Engineering   *Mar. 2018 — Feb. 2024*
College of Engineering   Cumulative GPA:**3.91/4.50**
(Top 10%; 156 credits completed / 150 required)
Recipient of Academic Excellence Scholarships (5 semesters)

RESEARCH INTERESTS

Image signal processing & Computer vision
Biomedical imaging system
Enhancement visibility via scattering media removal
Deep Learning for signal processing.

SKILLS

Languages	Korean (Native), English (OPIc IH), Japanese (Intermediate)
Programming	C/C++, Python, MATLAB, CUDA
Tools / OS	LaTeX, DigitCam, Spinnaker SDK, Pylon SDK, Git, Blender, Arduino, Raspberry Pi

RESEARCH PROJECTS

Image processing techniques for visualizing poor-visibility scenes under scattering media   Fukuoka, Japan

- *Research Assistant*   Apr. 2024 — Mar.2027 (Expected)
    - Led the development of the Adaptive Removal via Mask for Scatter (ARMS) algorithm to enhance visibility in images degraded by scattering media.
    - Resulted in multiple patent applications, including international patents (PCT), protecting the core technology and methodology.
- Grant number: 24K01120 (Funded by KAKEN, JSPS, PI:Prof. M.-C. Lee)

Development of AR rescue support system for disaster sites with poor visibility   Fukuoka, Tokyo, Japan
using optical signal processing and deep learning   May. 2024 — Mar. 2025 (Expected)

- *Research Assistant*
    - Designing and optimizing algorithms based on the ARMS to effectively remove non-uniform scattering media.
    - Currently working on embedding and optimizing the algorithm for real-time processing on the Microprocessor.
- Grant number: JPJ000255 (Funded by Fire and Disaster Management Agency of Japan, PI:Prof. M.-C. Lee)
- Grant type: Consigned research

Development of a 360-degree Digital Holographic Microscope (DHM) for 3D object profiling   Fukuoka, Japan

- *Research Assistant*   Apr. 2024 — Mar. 2025
    - Statistical approach implemented to mitigate phase error and denoise 3D profile reconstructions.
    - Applied a Kalman filter to suppress noise originating from the DC term in the Fourier domain.
- Grant number: 23K19964 (Funded by KAKEN, JSPS, PI:Dr. H.-W. Kim)

Development of pre-hatching sex determination technology for chickens   Fukuoka, Gifu, Niigata, Ibaraki, Japan

- *Research Assistant*   Apr. 2024 — Nov. 2024
    - Developed the core algorithm for high accuracy and efficiency.
    - Led the end-to-end development of image preprocessing systems, achieving improvement in accuracy from **56%** to **up to 97%** compared to previous methods.
    - Designed and implemented a Graphic User Interface (GUI) to streamline user interaction.
    - Created and packaged the necessary installer for seamless program distribution and development.
    - Domestic patent pending (Japan) in collaboration with Hitachi Solutions Create, Ltd. (HSC) and National Agriculture and Food Research Organization (NARO).
- Grant type: Joint Research with HSC and NARO (Funded by HSC, PI:Prof. M.-C. Lee)
- Related Article and Patent
    - Articles
        * Joint Development of Technology by HSC, NARO, and Kyushu Institute of Technology (Kyutech) for Non-destructive Pre-hatching Sex Determination for Eggs on the 3 Day of Incubation [Link] [pdf]
        * AI Identifies Chicken Embryo Gender with 97% Accuracy to Cut Costs: Hitachi Affiliate and Partners Developed New Technology [Link]
    - Patent
        * "Sex identification service provision system and sex identification service provision method" (Japanses Patent Application No.2025–154965)

PUBLICATIONS

Journal

[1] **J. Jeong**, and M.-C. Lee, "Scattering Medium Removal Using Adaptive Masks for Scatter in the Spatial Frequency Domain," *IEEE Access*, vol. 13, pp. 72769–72777, 2025.
DOI:10.1109/ACCESS.2025.3563369

Conference

[1] Y. Takahashi, **J. Jeong**, M. Cho, and M.–C. Lee, "A research on scattering media removal and photon estimation using COLaNoPS," *Proc. ICCAS 2025*, (IEEE), Incheon, Korea.
DOI: 10.23919/ICCAS66577.2025.11301366
[2] **J. Jeong**, M. Cho, and M.–C. Lee, "Advanced scattering media removal by modified ARMS and restoration of color information," *Proc. ICMV 2025*, (SPIE), Paris, France.   (In proceedings).
- Best Poster Presentation Award
[3] S. Song, **J. Jeong**, M. Cho, and M.–C. Lee, "Single Haze Removal Method using Peplography," *Proc. ICMV 2025*, (SPIE), Paris, France.   (In proceedings).
[4] **J. Jeong**, M. Cho, and M.–C. Lee, "Scattering media removal under the harsh conditions using adaptive removal via mask for scatter," *Proc. ITC-CSCC 2025*, (IEEE), Seoul, Korea.
DOI:10.1109/ITC-CSCC66376.2025.11137793
[5] K. Nakamura, **J. Jeong**, M. Cho, and M.–C. Lee, "Adaptive Optimization of Kalman Filtering in Digital Holographic Microscopy for Improved Noise Reduction," *Proc. ITC-CSCC 2025*, (IEEE), Seoul, Korea.
DOI:10.1109/ITC-CSCC66376.2025.11137616
[6] S. Kim, **J. Jeong**, M. Cho, and M.–C. Lee, "Advanced double random phase encryption for simultaneous two primary data," *Proc. ITC-CSCC 2025*, (IEEE), Seoul, Korea.
DOI:10.1109/ITC-CSCC66376.2025.11137702
[7] T. Ono, **J. Jeong**, H.–W. Kim, M. Cho, and M.–C. Lee, "Kalman filtering optimization in digital holographic microscopy (DHM)," *Proc. ICCAS 2024*, (IEEE), Jeju, Korea.
DOI:10.23919/ICCAS63016.2024.10773243
[8] **J. Jeong**, H.–W. Kim, M. Cho, and M.–C. Lee, "A study of noise reduction algorithm using statistical optimization in digital holographic microscopy," *Proc. JCSSE 2024*, (IEEE), Phuket, Thailand.
DOI:10.1109/JCSSE61278.2024.10613728

Patents

International Patents (PCT)

[1] M.–C. Lee and **J. Jeong**,   Pending
"Image processing apparatus, image processing method, and image processing program,"
PCT Patent Reference No. PCT/JP2025/037681

Domestic Patents   Japan

[1] M. Kamide, O. Shiba, K. Ozawa, T. Nakaya, M.–C. Lee, **<u>J. Jeong</u>**, and T. Tagami,   Sep. 18, 2025
"Sex identification service provision system and sex identification service provision method,"
Japanese Patent Application No. 2025–154965.

[2] M.–C. Lee and **<u>J. Jeong</u>**,   Jun. 10, 2025
"Image processing apparatus, image processing method, and image processing program,"
Japanese Patent Application No. 2025–097331.

[3] M.–C. Lee and **<u>J. Jeong</u>**,   Aug. 30, 2024
"Image processing apparatus, image processing method, and image processing program,"
Japanese Patent Application No. 2024–214715.

* In accordance with Japanese patent law, these applications are kept confidential and are not publicly disclosed for 18 months following their filing. (Reference)

Research Experience

Computational, Holographic and Optical signal processing Lab.   Anseong, Gyunggi-do, Korea
at Hankyung National University   Jan. 2024 — Feb. 2024
Visiting Research Student
Advisor: Prof. Myugnjin Cho

3D Optical Imaging System Lab. at Kyushu Institute of Technology   Fukuoka, Japan
Short-Term Visiting Researcher (Winter & Summer)   Jan. — Feb. & Jul. — Aug. 2023
Advisor: Prof. Min-Chul Lee

SoC Design Lab. at Dong-A University   Busan, Korea
Undergraduate Research Intern   Sep. 2022 — Jul. 2023
Advisor: Prof. Bongsoon Kang

Awards, Scholarships and Tuition Waivers

2025 18th International Conference on Machine Vision   Paris, France

- Best Poster Presentation Award

Kyushu Institute of Technology   Fukuoka, Japan

- **Waivers from Tuition Fees**
    - 2025, $1^{st}/2^{nd}$ semester
    - 2024, $1^{st}/2^{nd}$ semester

Dong-A University   Busan, Korea

- **Academic Excellence Scholarship**
    - 2023, $1^{st}/2^{nd}$ semester
    - 2022, 1st semester
    - 2021, 2nd semester
    - 2018, 2nd semester

- **Advisory Professor Scholarship from Dong-A University**
    - 2022, 2nd semester

- **Undergraduate Education Assistant Scholarship from Dong-A University**
    - 2023, $1^{st}/2^{nd}$ semester
    - 2022, 2nd semester

Relevant Coursework

Korea OpenCourseWare (KOCW)   Online, Korea

- Digital Image Processing   2025

IC Design Education Center (IDEC)   Online, Korea

- Implementation of CNN's FPGA with Verilog HDL   2024
- Design embedded systems based on FPGA
- Data structure and algorithm
- FreeRTOS porting and utilization through Cortex-M processor
- MIMO - theory and improvement

- Stereovision for autonomous driving system   2023
- Design digital system utilized Verilog
- IDEC SoC Design Course
- Neural network hardware accelerator "Architecture"
- DSP with MATLAB
- Foundation of CUDA-based GPU Programming

- PLL Design and Jitter Interpretation   2022
- Foundation of Reinforcement Learning

Korea Advanced Institute of Science and Technology (KAIST)   Seoul (Hybrid), Korea

- Microdegree from Graduate School of Data Science   2023

Leadership & Volunteering

International Capstone Design Presentation with Partner Universities   Fukuoka, Japan
Participant (Student Delegate)   Jan. 2026

Innovation Japan 2025   Tokyo, Japan
Student Staff   Aug. 21 2025 — Aug. 22 2025

Open Campus 2025 (Iizuka Campus, Kyushu Institute of Technology)   Fukuoka, Japan
Student Staff   Jul. 19 2025 — Jul. 20 2025

International Capstone Design Presentation with Partner Universities   Fukuoka, Japan
Participant (Student Delegate)   Jan. 2025

International Joint Research Meeting and Seminar   Kumamoto, Japan
Participant (Student Delegate)   Aug. 9 2024 — Aug. 10 2024

Embedded Systems Lab.   Busan, Korea
Leader   Sep. 2023 — Dec. 2023

- Embedded system design using ATMega128A
- Embedded system control using the I/O ports and potentiometer

Donga Challenge   Busan, Korea
Leader   Sep. 2023 — Dec. 2023

- Self-directed learning and project-based teamwork initiative
- Teaching basic programming (Python) and data analysis using Pandas and NumPy

Digital System Lab.   Busan, Korea
Leader   Sep. 2023 — Dec. 2023

- Basic programming (C/C++) and embedded system design using ATMega128A
- Teaching digital logic design and Verilog HDL

Dong-A Ping-Pong Association (DAPPA)   Busan, Korea
President   Mar. 2021 — Feb. 2022

Military Service

Republic of Korea Army Haman, Gyeongsangnam-do, Korea
Sergeant, Active Duty Soldier Apr. 2019 — Nov. 2020

- Award for Outstanding Army Warrior 2020
- Certificate of Appointment as Squad Leader
- Appointment Certificate as Squad Representative Soldier
- Commendation for Exemplary Soldier