

Joohyung Lee

ML Researcher, AITRICS



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EDUCATION

- **Texas A&M University** College Station, TX
Master of Science in Electrical Engineering August 2014
- **University of Texas at Dallas** Richardson, TX
Bachelor of Science in Electrical Engineering August 2012

EXPERIENCE

- **AITRICS** Seoul, South Korea
ML Researcher May 2022 - Present
 - **Geometric Machine Learning:** Incorporating equivariance to invariance self-supervision to enhance model robustness
 - **Foundation Model:** Developing a robust foundation model to predict critical patient events using self-supervision and LLM.
- **Korea Electronics Technology Institute** Sungnam-si, South Korea
Senior Researcher Dec 2020 - May 2022
 - **Self-Supervised Learning:** Self-Supervised pretraining and transfer learning for medical image analysis
- **KAIST, Robotics and Computer Vision Lab** Daejeon-si, South Korea
Researcher Mar 2020 - Dec 2020
 - **3D Image Volume:** Develop image encoding architecture for anisotropic medical volume
- **National Cancer Center** Gyeonggi-do, South Korea
Researcher October 2016 - March 2020
 - **Model Robustness:** Analyze and enhance the robustness of deep learning medical model in low-data regime
- **Laboratory for Optical Diagnosis and Imaging** Texas A&M University College Station, TX, US
Student Researcher March 2013 - June 2014
 - **Classic Machine Learning:** Feature extraction & selection and training using in-vivo auto-fluorescent signal data
- **Department of Electrical Engineering** Texas A&M University College Station, TX, US
Grader Jan 2014 - April 2014
 - **Signals and System:** Designed grading criteria for coding assignments and paper assignments and Graded coding assignments, paper assignments, and the exam
- **GEM Center** University of Texas at Dallas, TX, US
Math Tutor Jan 2011 - May 2011
 - **Math and Physics:** Tutored undergraduate level math and physics (Paid by The University of Texas at Dallas)

CONFERENCES

- J. Lee**, C. Kim, K. Lee. "Decoupling Equivariance from Invariant Self-Supervised Learning via Null-Space Projection." *In Preparation*.
- C. Kim, **J. Lee**, K. Lee, D. Yoon, E. Yang. "SPAM: Sampling Pattern Meta-Learning for Domain Generalization on Irregular Time Series." *In Preparation*.
- J. Lee**, C. Kim, H. Kim, K. Lee, J. Lee. "Soft Equivariance Regularization for Invariant Self-Supervised Learning." *Accepted to ICLR 2026* [pdf].
- J. Lee**, H. Nam, K. Lee, S. Hahn. "Compact and De-Biased Negative Instance Embedding for Multi-Instance Learning on Whole-Slide Image Classification." *ICASSP 2024*, [pdf].
- K. Lee, S. Lee, H. Hyun, S. Hahn, E. Choi, **J. Lee**. "Learning Missing Modal Electronic Health Records with Unified Multi-modal Data Embedding and Modality-Aware Attention." *MLHC 2023*, **Spotlight, Corresponding Author and co-first author**. [pdf][video]
- J. Lee**, J. E. Oh, I. Shin, Y. S. Kim, D. K. Sohn, T. S. Kim, and I. S. Kweon. "Moving from 2D to 3D: volumetric medical image classification for rectal cancer staging." *MICCAI 2022*. [pdf] [video]

WORKSHOPS

- K. Lee, J. Won, H. Hyun, S. Hahn, E. Choi, **J. Lee**. "Self-Supervised Predictive Coding with Multimodal Fusion for Patient Deterioration Prediction in Fine-grained Time Resolution." *ICLR 2023 Trustworthy Machine Learning for Healthcare Workshop*, Oral Presentation, **Corresponding Author, Best Paper Honorable Mention**. [pdf] [video]

JOURNALS

- J. Lee**, J. E. Oh, M. J. Kim, B. Y. Hur, and D. K. Sohn. "Reducing the Model Variance of Rectal Cancer Segmentation Network." *IEEE Access*, vol. 7, pp. 182725-182733, 2019. [pdf]
- H. Yoon, **J. Lee**, J. E. Oh, H. R. Kim, S. Lee, H. J. Chang, and D. K. Sohn, "Tumor Identification in Colorectal Histology Images Using a Convolutional Neural Network," *Journal of Digital Imaging*, 2018. [pdf]
- B. H. Malik, **J. Lee**, S. Cheng, R. Cuenca, J. M. Jabbour, Y.-S. L. Cheng, J. M. Wright, B. Ahmed, K. C. Maitland, and J. A. Jo, "Objective Detection of Oral Carcinoma with Multispectral Fluorescence Lifetime Imaging *In Vivo*," *Photochemistry and Photobiology*, vol. 92, no. 5, pp. 694-701, 2016. **Co-first Author** [pdf]

REFERENCES

- **Prof. Eunho Yang:** Research Supervisor
Associate Professor, Kim Jaechul Graduate School of AI, KAIST; Email: eunhoy@kaist.ac.kr
- **Prof. Juho Lee:** Research Collaborator
Associate Professor, Kim Jaechul Graduate School of AI, KAIST; Email: juholee@kaist.ac.kr
- **Prof. Dae Kyung Sohn:** Research Supervisor
Professor, Department of Public Health & Artificial Intelligence, National Cancer Center (South Korea)