

Joohan Lee

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EDUCATION

University of Southern California M.S. in Computer Science	Los Angeles, CA Jan. 2022 – Dec. 2023
Yonsei University B.E. in Computer Engineering	Wonju, South Korea Mar. 2015 – Feb. 2021

PROFESSIONAL EXPERIENCES

Samsung SDS America <i>Gen AI Software Engineer</i>	Ridgefield Park, NJ Oct. 2024 – Current
<ul style="list-style-type: none">• Led the development of an AI-powered mortgage processing product zero to one by architecting and implementing the full-stack (React/Electron, Flask) and AI/RAG pipelines, resulting in securing initial enterprise banking contracts with new partners.• Developed an LLM-powered sales data analyzer from scratch, leveraged prompt engineering and agentic tools, and improved response accuracy by 20% over the baseline.• Designed and implemented a multimodal retrieval-augmented generation (RAG) pipeline enhancing domain-specific information retrieval and generation performance, using LangChain, HuggingFace, Milvus, and AWS Bedrock.	
University of Southern California <i>Graduate Research Assistant</i>	Los Angeles, CA Dec. 2022 – May. 2024
<ul style="list-style-type: none">• Built an LLM-based on-device AI communication framework using Tensorflow to simulate the physical layer communications on a Linux server.• Developed diverse machine learning pipelines using PyTorch and TensorFlow, along with Python, Numpy, Linux, and Slurm to train language, computer vision, or generative AI models that drove substantial improvements across multiple applications.	
Purdue University <i>Research Intern</i>	Los Angeles, CA (Remote) May. 2022 – Apr. 2023
<ul style="list-style-type: none">• Developed WikiSER, a high-quality dataset of 1.7M sentences with 79K labeled software entities, achieving an 8.62% reduction in error rate compared to existing benchmarks.	

PROJECTS

Integrating Pre-Trained Language Model with PHY Communications [GitHub]	Feb. 2023 - Feb. 2024
<ul style="list-style-type: none">• Integrated the language model (BART) into a realistic 5G NR simulator, enhancing communication efficiency.• Applied vector quantizing into the AI communication system, resulting in 10% noise-robustness and 50% compression.	
Generative Model for Channel Feedback Compression	Dec. 2023 - Apr. 2024
<ul style="list-style-type: none">• Implemented a PyTorch-based framework for NR-MIMO channel prediction leveraging generative AI models (e.g., VQ-VAE).	
Deep Learning-based Large-scale Channel Prediction	Dec. 2022 - Jun. 2023
<ul style="list-style-type: none">• Developed a PyTorch-based machine learning framework, enhancing model accuracy by 18% through optimization of model architecture, fine-tuning, and data augmentation.• Secured 1st place in the ML competition (IEEE ICASSP Radio-Map Prediction Challenge [2]), outperforming competitors by achieving the highest accuracy.	

PUBLICATIONS

[1] Ju-Hyung Lee, Dong-Ho Lee, Joohan Lee , Jay Pujara. "Integrating Pre-Trained Language Model with Physical Layer Communications", IEEE Transactions on Wireless Communications [LINK]	
[2] Ju-Hyung Lee, Joohan Lee , Seon-Ho Lee, Andreas F. Molish. "PMNet: Large-Scale Channel Prediction System for ICASSP 2023 First Pathloss Radio Map Prediction Challenge," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) [LINK]	
[3] Tai Nguyen, Yifeng Di, Joohan Lee , Muhao Chen, Tianyi Zhang. "Software Entity Recognition with Noise-Robust Learning", In 38th IEEE/ACM International Conference on Automated Software Engineering (ASE '23) [LINK]	

SKILLS

Programming Languages	Python, C/C++, JavaScript, TypeScript, Java, JSP, SQL, HTML, CSS, VBA
Technologies	PyTorch, TensorFlow, NLP, Deep Learning, Linux, HPC, Slurm, Node.js, Flask, MySQL, React, AWS, HuggingFace, Bedrock, Langchain, Milvus, Git, Nginx, Unicorn

HONORS and AWARDS

1st-rank award in IEEE ICASSP Signal Processing Grand Challenges (ML competition) [2]	Jun. 2023
3rd-rank award in the IMSC SW Pioneer Hackathon at University of Southern California	Jul. 2022
3rd-rank award in the Capstone Design Competition at Yonsei University (IoT Smart Mirror using Gen AI)	Nov. 2020