




JUNPYUNG KIM

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EDUCATION

Seoul National University

B.S. in Computer Science and Engineering

B.S. in Entrepreneurship

Mar. 2018 – Feb. 2025

PUBLICATION

Junpyung Kim, Jaeseong Lee, Seungwon Hwang. **Language as Skill: Skill Neurons on Multilingual Neural IR Models.**

European Conference on Information Retrieval 2024. (Submitted)

RESEARCH EXPERIENCE

Language Data Intelligence Lab

Undergraduate Researcher (Advisor: Prof. Seungwon Hwang)

Seoul, Republic of Korea

Jun. 2023 – Jun. 2024

- Conducted research on the interpretability of multilingual language models. Co-first authored a short-track paper for the European Conference on Information Retrieval 2024.
- Researched the concept of skill neurons in the context of Multilingual Dense Passage Information Retrieval models at the paper. Proposed a novel approach to identify the multilingual version of *skill neurons*.
- Proposed a method that utilizes binomial distribution to find skill neurons with higher expected intersection than the expected value during the research. Showed that skill neurons are dependently distributed.
- Applied NLP Skill Neuron to computer vision by a novel method for my bachelor's thesis. Utilized the intersection method to extend the concept of skill neurons to fine-grained classification through vision transformer and visual prompt tuning.

Structure and Knowledge Injection Machine Learning Lab

Undergraduate Researcher (Advisor: Prof. Jae-yoon Lee)

Seoul, Republic of Korea

Jul. 2023 – Aug. 2023

- Participated in the Google Explore Computer Science Research program sponsored by Google and engaged in research experience. Presented papers and research trends about the International Conference on Machine Learning.

Computing and Memory Architecture Lab

Undergraduate Researcher (Advisor: Prof. Sungjoo Yoo)

Seoul, Republic of Korea

Jul. 2020 – Aug. 2020

- Served as a research assistant for Deep Learning-based 3D object learning and rendering technology for an AR glasses project. Participated research utilizing unsupervised learning leveraging disparities between human eyes and convolution to separate objects in vision.

PROFESSIONAL EXPERIENCE

SAP Labs Korea

Software Developer and Internship

Seoul, Republic of Korea

Jul. 2024 – Aug. 2024

- Deployed a dashboard by Grafana to visualize Out-of-memory (OOM) situations, which were previously monitored individually in person. The dashboard provided visualizations of memory-related issues and offered appropriate solutions to mitigate OOM events.
- Researched unsupervised time series anomaly detection on memory usage by utilizing statistical techniques such as ARIMA and DAMP. Investigated an ensemble approach that combined these methods with the SAP's expert's knowledge, leading the project proposal and demonstrating the potential for improved anomaly detection in database memory management.

Republic of Korea Air Force Education & Training Command

Full-time Software Developer

Jinju, Republic of Korea

Aug. 2021 – May 2023

- Developed a training simulation program using Unity engine and C# language to assist commanders in making command decisions during base defense scenarios about monitoring troop deployment, disasters, and risk factors for training. Collaborated with an active-duty Air Force sergeant on the design and independently implemented the program.
- Collaborated with developers to develop a program for simulating aircraft component cleaning processes based on Unity. Implemented a simulation for the sequential disassembly and cleaning of aircraft components during the ultrasonic cleaning.

- Co-created a program that simulates the operation of an armored vehicle with another developer. Responsible for designing and implementing simulations of the functioning of the vehicle's doors and components and creating training simulations that allowed users to test the operations of the vehicle.

Veradi

Seoul, Republic of Korea

Full-time Software Developer and Data analyst

Dec. 2020 – Mar. 2021

- Analyzed the mock exam scores of test-takers preparing for the South Korean College Scholastic Ability Test. Utilized the Item Characteristic Curve to evaluate students based on the difficulty of the questions they solved. The program displayed students' weaknesses compared to other students and recommended personalized classes and workbooks.

3S Soft

Seoul, Republic of Korea

Software Developer and Internship

Feb. 2020 – Mar. 2020

- Automated integration tests for a cloud instance generation using Katalon Studio on Java as part of the 3S Soft network solution team.

AWARDS & ACHIEVEMENTS

Merit-based Scholarship, Seoul National University

Fall 2023

Smart City Department Head's Award, ESG Smart City Startup Hackathon

Jun. 2023

- Received the second prize in the competition and were awarded the Smart City Department Head's Award.
- Analyzed traffic data from security camera at intersections to develop a driving assistance service for vulnerable populations.

Merit-based Scholarship, Megastudy

May 2018

EXTRACURRICULAR EXPERIENCE

Analyzing Semiconductor Mass Production Data Project

Seoul, Republic of Korea

Freelancer

Feb. 2024 – May 2024

- Visualized GAONCHIPS's semiconductor mass production and experimental data through Python.

Dadam, Public Speaking and Presentation Skills Club

Seoul, Republic of Korea

President and Member

Mar. 2019 – Aug. 2020

- Participated in weekly speech sessions to improve speech skills through, peer feedback, and collaborative learning.
- Led the club successfully during the onset of the COVID-19 pandemic by adapting online recruitment strategies via social media and virtual events.
- Created a comprehensive activity plan that included Zoom meetings, virtual workshops, and safe outdoor speaking events, ensuring compliance with safety protocols such as temperature checks and social distancing.
- Managed to maintain and even grow club membership from 20+ to 40+ despite the challenges posed by the pandemic.

Language & Culture Program in Michigan

Ann Arbor, Michigan

Summer Semester Exchange Student

Jun. 2019 – Jul. 2019

- Participated in the program at the University of Michigan in the United States. Audited a philosophy course as part of Michigan's summer semester, interacted with local students and scheduled an individual meeting with the university professor to discuss research opportunities and career pathways in graduate studies.

SCSC, SNU Computer Study Club

Seoul, Republic of Korea

Member

Mar. 2019 – Aug. 2019

- Involved in weekly algorithm study group and explained tree dynamic programming techniques to club members.

SKILLS

Programming: Python, C/C++, C#, Java

Technologies: PyTorch, Tensorflow, Grafana, MySQL, Unity, Git, Linux

Libraries: Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn

Languages: Korean (Native), English (Professional : TOEFL iBT 107, GRE Verbal/Quant 155/170)