Jeongjae Lee

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RESEARCH INTERESTS

Medical Informatics, Biomedical Signal Processing

EDUCATION

Seoul National University   Mar 2019 - Aug 2024
Bachelor of Science in Electrical and Computer Engineering   Seoul, Republic of Korea
Summa Cum Laude
GPA: 4.20/4.3 (overall), 4.23/4.3 (major), Department Rank: 7/158

Gyeonggi Science High School   Mar 2016 - Feb 2019
High School Diploma   Suwon, Republic of Korea

RELATED EXPERIENCE

BioImaging, Signal Processing & Learning Lab   Sep 2024 - Present
Postbaccalaureate Researcher, Advised by Professor Jong Chul Ye   *KAIST AI*

· Developed PPG-based respiratory rate prediction model
· Improved CycleGAN-based scatter correction model by alleviating blob artifacts

DeepMetrics   Jan 2023 - Dec 2023
Research Intern, Advised by Professor Hyun Oh Song

· Involved in a project devising a method for **automated control of mechanical ventilators** in intensive care units
· Analyzed ICU ventilator data to devise an auto-screening method, omitting doctor actions during drug interventions
· Engineered features for training effective Decision Trees
· Developed code for dataset generation, data visualization, and selecting optimal model from multiple top-performing candidates by cross-validation

Machine Learning and Bioinformatics Laboratory   Jun 2022 - Dec 2022
Undergraduate Researcher, Advised by Professor Martin Steinegger   *Seoul National University*

· Involved in development of Foldseek, a **software suite for fast and sensitive comparisons of large structure sets** (published in *Nature Biotechnology*)
· Developed optimized code for LDDT alignment score computation, utilizing spatial hashing and SIMD instructions, resulting in 13x speedup compared to Pymican on single core
· Established and managed automated protein database update pipeline for Foldseek's web server

PUBLICATIONS

Michel van Kempen, Stephanie S Kim, Charlotte Tumescheit, Milot Mirdita, **Jeongjae Lee**, Cameron LM Gilchrist, Johannes Söding, Martin Steinegger. 2023. Fast and accurate protein structure search with Foldseek. In *Nature Biotechnology* [url]

HONORS AND AWARDS

Medical AI Scholarship　　　　Korea Health Industry Development Institute, 2022.9 - 2024.2
· 3 million KRW per semester, merit-based

Presidential Science Scholarship　　　　Korea Scholarship Foundation, 2019.3 - 2024.8
· Full tuition plus 2.5 million KRW per semester, for talented students majoring in science or engineering

Samsung HumanTech Paper Award (Bronze Prize, Biology)　　　　Samsung, 2017.2

TECHNICAL STRENGTHS

Advanced	C++, Python
Moderate	C, JavaScript, Bash, Verilog
Novice	Awk, MATLAB

LANGUAGE PROFICIENCY

Fluent in **English** and Native in **Korean**

- GRE: Verbal (159, 81%), Quantitative(170, 94%), Writing (5.5, 98%)
- iBT TOEFL: 117 (Reading: 30, Listening: 30, Speaking: 30, Writing: 27)

ONLINE COURSES

Neural Networks and Deep Learning - DeepLearning.AI	Coursera
Machine Learning - Stanford University	Coursera
Bash Scripting and Shell Programming (Linux Command Line) - Jason Cannon	Udemy
The Complete Node.js Developer Course - Andrew Mead, Rob Percival	Udemy
The Web Developer Bootcamp - Colt Steele	Udemy
Computer Systems: A Programmer's Perspective	Carnegie Mellon

EXTRACURRICULAR ACTIVITIES

ROK Army　　　　Feb 2021 - Aug 2022
Sergeant
· Served mandatory military service at Capital Mechanized Infantry Division.
· Accumulated two months of vacation due to COVID-19 restrictions, during which I started a research internship.

SNU Mentoring　　　　Mar 2020 - Nov 2020, Mar 2023 - Oct 2023
· Mentored middle/high school students with limited access to educational resources

Young Engineers Honor Society　　　　Dec 2019 - Aug 2024
· Honor society to promote the exchange between the engineering students.
Sponsored by National Academy of Engineering of Korea.

Volunteering Engineers & Scientists of SNU　　　　Mar 2019 - Dec 2019
· Worked on project of developing ergonomic cleaning tools for street sweepers