Jihyeon Je

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Education

Stanford University — Stanford, CA
Ph.D. Student in Computer Science — Sept 2023 –

Duke University — Durham, NC
BSE in Biomedical Engineering and Electrical & Computer Engineering, — May 2023
BS in Computer Science with a concentration in AI and Machine Learning
Coursework in BME (Medical Instrumentation, Materials and Synthetic Biology), ECE (Microelectronics, Quantum Engineering/Information Theory), Machine Learning, Computer Science
2020 Woo Fellow, 2022/21 DTech Scholar | GPA: 3.8/4.0

Research Experience

Duke University, Lafata Lab — Durham, NC
Undergraduate Researcher — May 2020 – present

- Developing an automatized feature extraction tool for the analysis of next generation pathomic signatures of inflammation from renal biopsy data
- Generation of synthetic time series image data using Fokker-Planck dynamics to create prediction models for head-and-neck cancer

Schrodinger, Machine Learning Team — New York, NY
Machine Learning Intern — May 2022 – Aug 2022

- Implemented diffusion-based generative model for ligand conformation generation to improve conformer quality
- Introduced new features and Gaussian processes to supervised regression and classification models and improved small molecule property prediction
- Devised and implemented automated routine for benchmarking and backtesting

Broad Institute of MIT and Harvard, Imaging Platform, Cimini Lab — Cambridge, MA
Research Intern — May 2021 – Aug 2021

- Built ML-based image analysis tools and workflows for 2D and 3D image segmentation and reconstruction
- Devised optimized strategies and network architectures to efficiently utilize sparse and limited bioimage data

Duke University, Caron Lab — Durham, NC
Undergraduate Intern — Sept 2019 – Mar 2020

- Worked on 3D reconstruction and statistical analysis of dendritic spines from EM images

NCMIR (National Center for Microscopy and Imaging Research), Mark Ellisman Lab — San Diego, CA
Intern — May 2017 – Mar 2020

- Worked on 3D computational reconstruction and segmentation of electron microscope images
- Contributed to CDeep3M-Preview by building the augmentation pipeline and wrote additional image analysis scripts for feature extraction from large-scale biological data

UNIST (Ulsan National Institute of Science and Technology), Protein Engineering Lab — Ulsan, South Korea
Research Assistant — Mar 2015 – Jul 2016

- Developed a fusion nano probe using affibody molecules for targeted cancer therapy

Additional Experience

Wolfram Alpha — Remote
2018 Wolfram Summer School Alumni, Student Ambassador — May 2018 – present

- Research focus on mathematical and computational analysis of the structure of viral capsids
- Developed the Protein Database Data Importer Function for the Mathematica functionality repository

Duke University Department of Electrical and Computer Engineering Durham, NC
Teaching Assistant Jan 2021 – Jan 2022

- Held lab sessions, office hours, and provide tutoring for students in Electrical & Computer Engineering 280: Signals and Systems

Leadership & Activities

Duke Undergraduate Machine Learning Durham, NC
Co-President Sept 2019 - present

- Organize yearly Datathon and Machine Learning Day events
- Host guest speaker sessions, manage funding, and plan monthly activities.

Duke iGEM (international Genetically Engineered Machine) Durham, NC
Subteam Lead Jan 2020 - present

- 2022 iGEM Silver Medal
- Developing a microfluidics-based organoid-tumor coculture platform for high throughput drug screening
- Creating a automatized computational tool to quantify organoid growth and drug efficiency

Duke ARAC (America Reads America Counts) Durham, NC
Volunteer Sept 2020 - present

- Volunteered at Durham Public Schools tutoring children to help them enhance primary-level reading and math skills

Publications

Haberl M.G.**,** Wong W., Penticoff S., **Je J.**, Madany M., Borchhardt A., Boassa D., Peltier S.T., Ellisman M.H. *CDeep3M-preview: Online segmentation using the deep neural network model zoo*.
Preprint at: https://doi.org/10.1101/2020.03.26.010660

Conference Proceedings

Stevens J, **Je J**, Gao Y, Wang C, Mowery Y, Brizel D, Yin F, Liu J, Lafata K. Radiomics on spatial-temporal manifolds via Fokker-Planck dynamics. American Association of Physicists in Medicine. 2022. **Poster presentation** delivered at the AAPM meeting, September, 2022.

Sotolongo G, **Je J**, Li X, Wang Y, Zee J, Wang B, Chen Y, Talawalla T, Hodgin J, Madabhushi A, Ozeky T, Mariani L, Holzman L, Janowczyk A, Barisoni L, Lafata K. Segmentation and Classification of Lymphocytes in the NEPTUNE Digital Kidney Biopsies via PatchSorter. United States and Canadian Academy of Pathology abstract. 34:847. **Poster presentation** delivered at the USCAP meeting, March, 2022.

Je J, Lucas A, Sterling D, Cimini B. Network Optimization with Limited Bioimage Data for Robust Semantic Segmentation. Society of Biomolecular Imaging and Informatics. **2nd Place Best Poster Award**, presentation delivered at the 2021 High Content meeting, remote, October, 2021.

Sotolongo G, **Je J**, Zee J, Chen Y, Li X, Wang Y, Hodgin J, Madabhushi A, Janowczyk A, Lafata K, Barisoni L. Cortical Tubulointerstitial Mononuclear Inflammation in Renal Biopsies is a Quantitative Biomarker of Clinical Outcomes in NEPTUNE Glomerular. United States and Canadian Academy of Pathology abstract 34:847. **Poster presentation** delivered at the USCAP meeting, remote, October, 2020.

Technical Skills

Programming	
Advanced:	Python, Java, Pytorch, TensorFlow, MATLAB, Scikit-learn, RDKit
Intermediate:	CSS, JavaScript, HTML, SQL
DevOps	Jenkins CI/CD
Chemical	QSAR, ADMET prediction, conformer generation
Biological	CellProfiler, Fiji/ImageJ, IMod, QuPath