PHD CANDIDATE · COMPUTER SCIENCE · COMPUTATIONAL BIOLOGY

Seok **Jung**

🛪 St. Louis, Missouri, USA | 🛛 (562) 760-8825 | 🜌 wooseokjung0826@gmail.com | 🏶 www.jungwooseok.com | 🗊 wsjung | 🖬 woosjung

Education

Washington University in St. Louis Ph.D. IN COMPUTER SCIENCE

University of Puget Sound

B.S. IN MATHEMATICS AND COMPUTER SCIENCE

Danish Institute for Study Abroad (DIS) Artificial Neural Networks and Deep Learning

Professional Summary_

Computational biologist with 5+ years of experience applying statistical, machine learning, and AI models to analyze large-scale multiomics datasets to study transcriptional gene regulation. PhD research involves modeling transcriptional gene regulatory networks and hypothesis testing for the role of gene regulation in complex traits such as exceptional longevity (EL). Extensive experience with Linux HPC environments, open-source software development, and building reproducible workflow pipelines.

Skills

Programming: Expertise in scripting languages (Python, R, Bash) and working in Linux HPC environments (SLURM, SGE); experienced with containerization tools (Docker, Singularity), workflow orchestration (Nextflow), cloud platforms (AWS), and version control systems (Git).

Machine Learning and Statistical Modeling: Strong background in statistical and machine learning modeling, with hands-on experience in classification, regression, GLMs, mixed-effect models, XGBoost, regularization, Bayesian hyperparameter optimization, and nested cross-validation; working knowledge of deep learning architectures including neural networks and transformers.

Languages: English and Korean (bilingual)

Publications

Vaha Akbary Moghaddam, Sandeep Acharya, Michaela Schwaiger-Haber, and Shu Liao, **Wooseok J Jung**, et al., Construction of Multi-Modal Transcriptome-Small Molecule Interaction Networks from High-Throughput Measurements to Study Human Complex Traits, bioRxiv, DOI: 10.1101/2025.01.22.634403

Sandeep Acharya, Vaha Akbary Moghaddam, **Wooseok J Jung**, et. al., FISHNET: A Network-based Tool for Analyzing Gene-level P-values to Identify Significant Genes Missed by Standard Methods, bioRxiv, DOI: 10.1101/2025.01.29.635546

Sandeep Acharya, Shu Liao, **Wooseok J Jung**, et. al., A methodology for gene level omics-WAS integration identifies genes influencing traits associated with cardiovascular risks: the Long Life Family Study, Human Genetics, DOI: 10.1007/s00439-024-02701-1

Yiming Kang, **Wooseok J Jung**, Michael R Brent, Predicting which genes will respond to transcription factor perturbations, G3 Genes|Genomes|Genetics, Volume 12, Issue 8, August 2022, jkac144, DOI: 10.1093/g3journal/jkac144

Software_

FISHNET This software implements the FISHNET method for HPC systems using Singularity or Docker containers. https://brentlab.github.io/fishnet/

nf-core/omicsgenetraitassociation A nextflow pipeline which integrates multiple omic data streams and performs coordinated analysis. https://nf-co.re/omicsgenetraitassociation

corrmeta R implementation of correlated meta-analysis avaiable on CRAN. https://CRAN.R-project.org/package=corrmeta

St. Louis, Missouri Aug. 2020 - PRESENT

Tacoma, Washington 2016-2020

Copenhagen, Denmark 2019

Research and Teaching Experience

Brent Lab

Doctoral Research Assistant

- Spearheaded open-source software initiatives, contributing to three open-source software that facilitate reproducibility, transparency, and accessibility in bioinformatics research.
- Mentored undergraduate and Master's students on statistical analysis, study design, and bioinformatics workflow systems design. Contributed to 4 publications and 3 active research projects.

Washington University in St. Louis

GRADUATE TEACHING ASSISTANT - ALGORITHMS IN COMPUTATIONAL BIOLOGY

- Delivered lectures on differential expression analysis and transcription factor (TF) activity inference, providing students with practical and conceptual foundations for evaluating methods in systems biology and regulatory network modeling.
- Supported student learning through weekly office hours, assignment and quiz grading, and prompt responses to questions via Piazza and email.

ChirpGAN: A Generative Adversarial Network (GAN) for Synthesizing Artificial Bird Calls

SENIOR CAPSTONE PROJECT, SCRUM LEADER

- Developed a data pipeline to process over 30GB of bird vocalization audio into scalogram image datasets using wavelet transforms, flood-fill algorithms, and downscaling techniques
- Successfully synthesized artificial bird vocalizations by reconstructing audio from scalograms generated by progressive growing generative adversarial network (PGGAN) models across three resolutions.

McCormick Summer Research

STUDENT RESEARCHER

- Applied a complex Morlet wavelet transform to raw mouse vocalization and produced scalogram image representations in multiple resolutions.
- Successfully generated artificial scalogram representations of mouse vocalizations using generative adversarial network models.

Additional Experience

CJ OliveNetworks

DIGITAL TRANSFORMATION (DT) INTERN

- Assisted the team with research and translation of machine learning papers on GANs, time series forecasting, and video summarization.
- Analyze viability of methods via small-batch model implementation and minimum viable product testing
- Presentation to the board of directors on successful implementation of Temporal Fusion Transformer (TFT) model, improving 14day and 21-day retail sales forecasting accuracy by 12%.

University of Puget Sound, Math/CS Department

DEPARTMENT ASSISTANT

• Lab TA, grader, and held office hours for Computer Science and Math courses including Data Structures, Operating Systems, Calculus, Linear Algebra, and Statistics; provided lab instruction, graded coursework, and held regular tutoring sessions.

Honors & Awards

2022-2025 Genome Analysis Training Program (GATP) NHGRI grant T32 HG000045

May 2020 Goman Book Award

May 2019 McCormick Scholar Award

Dec. 2019 Thomas and Hilda Jack Department Scholarship

2018-2019 McGill Family Department Scholarship

2017-2020 Dean's List Award

Extracurricular Activity_

Association for Computing Machinery (ACM) Student Chapter

CHAPTER CHAIR

• Organized annual distinguished speakers lectures, high school student shadowing experiences, and computing workshops.

References_

Available on request.

Tacoma, WA Summer 2019

Seoul, South Korea May 2020 - Aug. 2020

Jan. 2017 - May 2020

University of Puget Sound

Tacoma, WA

2017-2020

St. Louis, MO

St. Louis, MO

Tacoma, WA

Jan. 2020 - May 2020

Fall 2022

Jan. 2021 - Present