Woo Seok **Jung**

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EDUCATION

Washington University in St. Louis *St. Louis, MO*
PH.D. IN COMPUTER SCIENCE *2020 - Expected Aug. 2026*

University of Puget Sound *Tacoma, WA*
B.S. IN MATHEMATICS AND COMPUTER SCIENCE *2016-2020*
Senior Thesis: ChirpGAN: Generative adversarial networks to synthesize bird vocalizations.
Study Abroad: Danish Institute for Study Abroad (Focus: Artificial Neural Networks and Deep Learning), 2019.

PROFESSIONAL SUMMARY

Computational biologist with six years of experience applying statistical, machine learning, and AI models to analyze large-scale multi-omics datasets to study transcriptional gene regulation. Doctoral researcher specializing in transcriptional gene regulatory networks. Proven track record of developing reproducible HPC pipelines (Nextflow/Docker) and novel ensemble learning frameworks (METANet) to solve complex multi-omics challenges.

SKILLS

Languages: Python, R, SQL, Bash/Shell

Tools: Docker, Singularity, Nextflow, AWS, Linux (SLURM, SGE), Git
Methods:
- **Bioinformatics**: Multi-omics Integration, Network Inference, Differential Expression
- **Statistical Modeling**: GLMs, Mixed-Effect Models, Hypothesis Testing, Bayesian Hyperparameter Optimization
- **ML/Deep Learning**: Ensemble Learning, Neural Networks, Transformers

Libraries:
- **Python**: Scikit-learn, Pandas, NumPy, statsmodels, PyTorch, TensorFlow/Keras
- **R**: Tidyverse, Bioconductor, mgcv, glmnet, seurat, xgboost, caret, ggplot2

PUBLICATIONS

Wooseok J Jung, et al., METANet: A supervised ensemble learning framework for reconstructing direct and functional tissue-specific transcription factor networks, *bioRxiv*, 2025.10.10.681634.

Mengze Li, Zeyuan Song, Eric Reed, Tanya T. Karagiannis, Stacy Andersen, Michael Brent, Chase Mateusiak, Sandeep Acharya, **Wooseok J Jung**, et al., Whole blood transcriptional signatures of age and survival identified in Long Life Family and Integrative Longevity Omics Studies, *bioRxiv*, 2025.07.15.664976.

Vaha Akbary Moghaddam, Sandeep Acharya, Michaela Schwaiger-Haber, and Shu Liao, **Wooseok J Jung**, et al., Gene-Embedded Multi-Modal Networks for Population-Scale Multi-Omics Discovery, *bioRxiv*, 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*, 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*, 143, 1241–1252 (2024).

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.

Full publication list available on Google Scholar

OPEN SOURCE SOFTWARE

FISHNET Implements the FISHNET method for HPC systems using Singularity/Docker containers available on `GitHub`.
nf-core/omicsgenetraitassociation Nextflow pipeline which performs multi-omics meta analysis avialable on `nf-core`.
corrmeta R implementation of correlated meta-analysis available on `CRAN`.

TEACHING AND MENTORING EXPERIENCE

Washington University in St. Louis *St. Louis, MO*
GRADUATE TEACHING ASSISTANT - ALGORITHMS IN COMPUTATIONAL BIOLOGY *Fall 2022*

- Delivered lectures on differential expression analysis and transcription factor (TF) activity inference.
- Aided in scientific understanding of material via weekly office hours, grading, and Piazza responses.

University of Puget Sound, Math/CS Department *Tacoma, WA*
DEPARTMENT ASSISTANT, STUDENT INSTRUCTOR *Jan. 2017 - May 2020*

- Co-instructed lab sessions for Data Structures and Operating Systems courses. Graded coursework and held office hours for several Computer Science and Math courses.

Mentored Trainees:
WASHINGTON UNIVERSITY IN ST. LOUIS

Mingyue Ding, Undergraduate Assistant	2025-2026
Daniel Ruskin, Undergraduate Assistant (now PhD candidate at UMD)	2023-2025
Thomas Westbrook, Undergraduate Assistant (now PhD candidate at UPenn)	2021-2025

ADDITIONAL EXPERIENCE

CJ OliveNetworks *Seoul, South Korea*
DIGITAL TRANSFORMATION (DT) INTERN *May 2020 - Aug. 2020*

- Conducted feasibility review of SOTA time-series forecasting literature, identifying and pitching the Temporal Fusion Transformer (TFT) architecture.
- Developed and evaluated MVP implementations for retail sales forecasting and video summarization.
- Presented results to the Board of Directors: demonstrated a 12% increase in 14-day and 21-day accuracy, leading to the successful adoption of the TFT model.

HONORS & AWARDS

Genome Analysis Training Program (GATP) NHGRI grant T32 HG000045	*2022-2025*
Goman Book Award	*May 2020*
Thomas and Hilda Jack Department Scholarship	*Dec. 2019*
McCormick Scholar Award	*May 2019*
McGill Family Department Scholarship	*2018-2019*
Dean's List Award	*2017-2020*

EXTRACURRICULAR ACTIVITY

Association for Computing Machinery (ACM) Student Chapter *University of Puget Sound*
CHAPTER CHAIR *2017-2020*

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