Winston Chen

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Education

University of Washington *Seattle, WA*

B.S. in Electrical Engineering, with a minor in Entrepreneurship *Sept 2018 - June 2022*

- GPA: 3.8/4.0; *Cum Laude*
- **Courses:** Optimization and Machine Learning, Statistical Learning, Signal Processing, Probability, Computer Architecture, Data Structure and Algorithms, System Programming, Linear Algebra, Data Programming

Academic Experience

Noble Research Lab, Genome Science, University of Washington *Seattle, WA*

Research Assistant *July 2019 - Present*

- Studied protein homology prediction by developing an ML algorithm that can make homology prediction at controlled error-rate.
- Developed neural network interaction interpretation methods to discover biological feature interactions (e.g. Transcription Factors).
- Regularly met with research mentor and PI to provide project update and discuss challenging problems.
- More details in ”Research Project” section.

Electrical Engineering, University of Washington *Seattle, WA*

Teaching Assistant *Dec 2020 - June 2022*

- Courses taught: Fundamentals of Electrical Engineering, Digital Circuit and System, Programming For Signal and Information Processing Applications
- Hosted office hours and lab sections to answer student questions regarding various topics in the course.
- Designed and graded homework/exam problems to evaluate students' understanding of course materials.

Industry Experience

RealNetworks *Seattle, WA*

Software Engineering Intern *August 2022 - Present*

- Built a prototype of FIDO2 roaming authenticator app that allows user to register/login with online services using the Webauthn standard.
- Integrated the roaming authenticator with SAFR facial recognition technology to enable biometrics-based user verification.
- Demonstrated the authenticator in collaboration with StrongKey at the flagship FIDO conference, Authenticate 2022.

NVIDIA *Santa Clara, CA*

Python Engineering Intern *Apr 2020 - Sept 2020*

- Built and deployed a testing infrastructure for analyzing and visualizing NVIDIA's genomics computing software logs.
- Drove discussions with core developers regarding testing infrastructure's feature requirements.
- Presented the final project results through a slide deck, confluence page, and detailed README.

Leadership Experience

Housing & Food Services, University of Washington *Seattle, WA*

Assistant Resident Director *September 2021 - June 2022*

- Facilitated moving 500+ residents into Elm Resident Hall in the course of four days.
- Advised Elm Hall council in organizing 20+ building wide events during the 2022-2023 academic year.
- Assisted the Elm Hall resident director in managing 10 resident advisors through administrative tasks such as scheduling on-calls.

IEEE-HKN Honor Society, University of Washington
Seattle, WA

Corporate Relations Officer
Sep 2020 - June 2022

- Attended weekly meetings to provide updates on current corporate relationship projects.
- Collaborated with industry recruiters (e.g. TI, Tesla, Wyze) to organize 10+ industry network events.
- Maintained active relationships with industry sponsors through email and check-in meetings.

Housing & Food Services, University of Washington
Seattle, WA

Resident Advisor
Sep 2019 - June 2022

- Collaboratively planned and executed 30+ events every year to engage 150+ residents.
- Created and maintained floor decorations to form a welcoming residential environment.
- Regularly on-call 5PM-8AM to provide residents with emergency assistance and secure the safety of the entire residence hall.

Research Projects

Confidence Estimation for Protein Homology Prediction
Seattle, WA

Noble Research Lab, Genome Science, University of Washington
July 2019 - Present

- Integrated Rankprop, a network propagation-based protein homology prediction algorithm, with knockoff framework, a statistical framework for false discovery rate (FDR) estimation, to produce statistical confidence estimation for predicted protein homology.
- Implemented a baseline method that uses permutation tests and Benjamini-Hochberg (BHq) procedure to produce protein homology confidence estimation and evaluate results from the knockoff-based method.
- Applied the proposed method on open sourced protein structure databases such as SCOP and SWISS-PROT for methods evaluation.
- Presented research work at University of Washington's annual undergraduate research symposium. Talk available here.

Error-controlled Interaction Detection in Neural Network.
Seattle, WA

Noble Research Lab, Genome Science, University of Washington
April 2021 - Present

- Proposed and implemented a novel method that applies knockoff framework to neural networks feature interaction interpretation methods (etc. NID, Integrated Hessian, and ParaACE) for discovering significant feature interactions at controlled error-rate.
- Solved the bias issue in interpreted interaction strength by designing an aligner model which learns to debias interaction through minimizing the maximum mean discrepancy (MMD) distance between biased and unbiased interaction distributions.
- Designed and generated simulation datasets that contains synthetic feature interactions. Applied the proposed method to discover synthetic feature interactions at desired error-rate.
- Applied the proposed method to fruit flies (Drosophila)'s enhancer data and identified meaningful transcription factor interactions at desired error-rate.

Skills

Programming Languages Python, JavaScript, Java, C/C++, System Verilog
Tools and Frameworks Git, LaTeX, PyTorch, TensorFlow, Numpy, Matplotlib

Scholarships

2021 **Mary Gates Research Scholarship**
2020 **Lawrence & Lucille Frey Endowed Electrical & Computer Engineering Scholarship**
2018 **Herschel & Caryl Roman Scholarship**