Weiyou Li

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🎓 **BMath, Pure Mathematics, Statistics**, University of Waterloo, **Expected 2027**

Summary of Qualifications

- Proficient in Python, R, and C with project experience in TensorFlow, PyTorch, scikit-learn and Jupyter.
- Strong foundation in ML concepts, LLMs, statistical modeling, and data visualization.
- Hands-on experience with data preprocessing, model training, tuning, and evaluation.
- Excellent problem-solving and communication skills, experienced in breaking down complex concepts and collaborating with different teams.
- Highly motivated and a fast learner, detail-oriented, and always open to new challenges.

Projects

ANN vs. LR on Small Datasets (Research Project) *Graduate-Admission*
Supervised by Yuan Wu (Duke University) *June 2025 - Sept 2025*

- **Tools used: PyTorch, TensorFlow, scikit-learn, Matplotlib.**
- Built and compare artificial neural networks and logistic regression on a graduate admissions dataset of 400 samples, testing model performance with small amounts of data to help with algorithm selection under limited resources.
- Improved ANN performance by approximately 22 % by adjusting its hyperparameters such as hidden-layer size, number of epochs, and batch size.
- Performed correlation analysis using Pearson coefficients to identify the top 5 features for logistic regression and improving model interpretability.

Sepal Species Classification (**Python, scikit-learn, matplotlib, Seaborn**) *Sepal*

- Preprocessed and normalized a 150-sample dataset using a 70:30 train-test split and Z-score scaling, improving model training speed and ensuring fair comparison across six regularization settings.
- Tuned six logistic regression regularization parameters and evaluated accuracy, selecting the best setting to balance bias and variance and achieving 92% test accuracy.
- Plotted decision boundaries with a custom Matplotlib function, making model predictions easier to understand and helping visualize classification behavior for all 150 samples.

Experience

Research Assistant *Waterloo, ON*
University of Waterloo *Sept 2025 – Present*

- Reviewed 15+ research papers on symmetric functions to establish a solid foundation for computational experiments.
- Analyzed 10+ scenarios to identify when two different partitions yield the same result and applied to a more general condition gradually by using rigorous proofs to improve reliability of findings.
- Executed 20+ computations to identify patterns using SAGE, supporting hypothesis testing and speeding up result generation by approximately 10%.

Mathematics Instructor *Etobicoke, ON*
Humber Polytechnic *June 2025 – Sept 2025*

- Adapted lessons using evaluation data, guiding over 80% of students to prepare for advanced courses.
- Explained complex concepts in clear and simple steps, helping students build confidence and increased their engagement.
- Collaborated with staff and counselors to connect math lessons to STEM goals, creating a supportive environment that expanded access to postsecondary opportunities.

Math Tutor with Data Analysis *Etobicoke, ON*
Humber Polytechnic *May 2025 – Aug 2025, Sept 2024 – Dec 2024*

- Analyzed monthly attendance trends by selecting and applying appropriate statistical models, supporting supervisors to identify peak times and adjust outreach strategies that increase attendance by approximately 17% on average.
- Provided simplified explanations of complex topics in data structures and machine learning to students from non-technical backgrounds, leading to higher engagement and received 4.9/5 rating across 100+ tutoring sessions.
- Guided students in debugging by breaking down complex concepts with real-world examples, improving their grades on average of 15%.