ETHAN VILLALOVOZ

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EDUCATION

Washington State University, Honors College August 2021 - May 2025
B.Sc. | Computer Science, Minor Mathematics (GPA: 3.94/4.0, Summa Cum Laude) *Pullman, WA*

- Senior Design Project: Retrieval-Augmented Generation (RAG) using Knowledge Graphs and Vector Search
- Relevant Coursework: Artificial Intelligence, Machine Learning, Data Mining, Bioinformatics, Optimization, Linear Algebra, Probability & Statistics, Design & Analysis of Algorithms, Object-Oriented Software Principles

TECHNICAL SKILLS

Programming Languages	C/C++, Python, HTML/CSS, Haskell, MATLAB, LaTeX, C#, SQL, R
Developer Tools	VS Code, Xcode, CLion, PyCharm, RStudio, Git, GitHub, GitLab, Docker
Technologies/Frameworks	PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, ROS, CUDA

PROFESSIONAL EXPERIENCE

Washington State University August 2023 – December 2024
Doppa Laboratory | Undergraduate Research Assistant *Pullman, WA*

- Analyzed security vulnerabilities in LLM-generated code using Python and EvalPlus, identifying and mitigating risks to strengthen system integrity, with improvements tracked through internal security metrics.
- Assisted in developing and validating a Bayesian optimization method for improving LLM-driven code generation accuracy, by performing computational experiments and data analysis.

Carnegie Mellon University June 2024 – August 2024
HARP (Human And Robot Partners) Laboratory | Robotics Institute Summer Scholars *Pittsburgh, PA*

- Developed a Bayesian inference-driven reward learning system enabling robots to dynamically interpret and adapt from human corrections, significantly improving alignment with user preferences in interactive tasks.
- Implemented an adaptive clarification dialogue mechanism that reduced robot uncertainty by proactively querying users on relevant object attributes (e.g., color, type, material), enhancing interpretability.
- Evaluated system performance through simulated dishwasher loading tasks, demonstrating improved task efficiency, reduced error states, and refined robot behavior following iterative state corrections and user dialogues.

Google May 2023 – August 2023
STEP (Student Training in Engineering Program) Intern | Google Core *Sunnyvale, CA*

- Accomplished development of 5 statistics collection jobs for pending queues within the team's internal database using C++ and SQL, optimizing cost expenditures, and providing clients with valuable insights.
- Achieved remarkable efficiency by conducting incremental job sampling, scaling from 1% to 100% of the database in under 4 hours—decreasing anticipated run-time by 66% and enhancing overall process effectiveness.
- Developed dynamic graphs to empower clients with real-time monitoring and analysis of outputs from stats collection jobs, utilizing expertise in HTML and a SQL-like language to enhance data visualization and insights.

PROJECTS

Generative AI for Video-to-Text Summarization (PyTorch, Transformers) August 2024 – December 2024
Developed and fine-tuned transformer-based models (FLAN-T5, BART) to summarize instructional videos from the HowTo100M dataset, improving summarization quality measured by ROUGE and BLEU evaluation metrics.

Analyzing YouTube's Trending Page (Apriori, Logistic Regression, Scikit-learn) April 2024 – May 2024
Performed data mining using association rule mining and logistic regression on YouTube trending video data, identifying key features like viewer engagement metrics that significantly impact video popularity and virality.