Henry Vu

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Education

University of Texas - Dallas Richardson, TX
M.Sc. Computer Science - Intelligent Systems *Sep. 2024 - Expected Aug 2027*

University of Alberta Edmonton, AB
B.Sc. Computing Science with Honors *Sep. 2019 - May 2024*

- **GPA: 3.83/4.0**, graduated *Summa cum laude*. International Student Scholarship, Dean's list 2020 - 2024.
- **Coursework**: algorithms, database, probability theory, optimization theory, deep learning, RL, CV, NLP.

Experience

Teaching Assistant Jan 2025 – Present
University of Texas at Dallas *Richardson, TX*

- Held weekly office hours, prepared seminar and exam materials, and graded coursework.
- Helped students understand concepts in *Algorithms* and *Data Structures*.

Research Assistant Apr. 2022 - May 2024
Alberta Machine Intelligence Institute (Amii) *Edmonton, AB*

- Implemented algorithms for **online optimization problems** using the online **primal-dual** framework.
- Analyzed competitive ratios where ML predictions are available, extending beyond traditional worst-case analysis.
- Conducted a comprehensive survey on stochastic, adversarial, Markovian and restless **multi-armed bandits**. Built simulations in **Python** to assess real-world performance of UCB, Exp3, Gittins Index, etc. [REPO]

Projects

UManitoba Navigator | *Python, FastAPI, React, HTML/CSS, Git* Feb 2024

- Mapped Manitoba with OpenStreetMap data, including tunnels and hidden pedestrian paths. Won first-time participant award at *.devHacks*.
- Designed backend API with **FastAPI** and used **React Leaflet** for interactive map.
- Implemented **Dijkstra's algorithm** for optimal route finding using geo-coordinates as graph vertices. [REPO]

Decode EEG using Multi-Modal Approach | *Python, MATLAB, HuggingFace* Sep. 2023 - Dec. 2023

- Identified bad electrodes, cleaned, and transformed EEG data using **ICA** and *Automagic* in **MATLAB**.
- **LLMs**: Implemented RoBERTa for tokenization and embedding, resulting in an increase of **274%**, **78%**, and **1.4%** in F1-score compared to Gaussian, GloVe and BERT embeddings on a 10-label classification task.
- Using **PyTorch**, developed a novel EEG extraction framework by combining a **convolution** and a **self-attention** module. Achieved consistent increases in F1-score across all 4 embedding types. [PAPER][REPO]

HabiTrak Android Application | *Java, GoogleMapsAPI, Firebase* Sep. 2022 - Dec. 2022

- Built a social media application in **Android Studio** for tracking and sharing user habits.
- Integrated **Google Maps Platform** to enable real-time location tracking and interactive mapping. Used **Google Firestore** to manage user data.
- Performed unit testing with **JUnit** (achieved **100%** class and method coverage). [REPO]

Tourist Neighborhood in Toronto | *pandas, NumPy, scikit-learn, FoursquareAPI* April. 2021 - May. 2021

- Conducted geospatial analysis on 103 neighborhoods using venue data from the **Foursquare API** and Wikipedia.
- Engineered features with one-hot encoding to analyze 234 unique venue categories.
- Applied **K-Means** clustering to segment neighborhoods into 4 clusters. K is optimized using **Elbow method.**
- Visualized with **Folium maps**, identifying key zones: airport, dining, recreational and camping. [REPO]

Technical Skills

Languages: Python, Java, Linux, C++, R, SQL, HTML/CSS, JavaScript, MATLAB, LaTeX.
Frameworks and Libraries: NumPy, PyTorch, TensorFlow, HuggingFace, React, Node.js, JUnit, FastAPI.
Developer Tools: Git, Linux, Docker, MongoDB, Android Studio, R Studio, VS Code, Firebase.
Certifications: IBM Data Science Professional Certificate, IBM Machine Learning Certificate, Web Development.