

# Mirza Ahmadi

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## EDUCATION

### University of Guelph

Jan 2024 - Present

*M.Sc., Bioinformatics and Artificial Intelligence (Vector Institute Scholar) – Research-based (Current GPA: 3.9/4.0)* Guelph, ON

- Relevant Courses: Machine Learning for Sequences, Computational Thinking for AI, Bioinformatics Software Tools
- Graduate Student Representative on the Bioinformatics Steering Committee and Graduate Student Council

*B.Sc. (Hons), Zoology Major with Minor in French Studies (GPA: 3.7/4.0)*

Sep 2019 - April 2023

## SKILLS AND CERTIFICATIONS

- **Languages & Tools:** Python, R, Bash, Linux, High-Performance Computing (HPC), Git, HTML & CSS
- **Relevant Libraries:** Scikit-learn, TensorFlow, PyTorch, Pandas, NumPy, NLTK, Matplotlib
- **Specialized Skills:** Machine Learning (ML), Deep Learning (DL), Genomics, Computer Vision, Data Visualization
- **Certifications:** [2024 CIFAR DL+RL Summer School](#) | [Compute Ontario Summer School 2024 \(ML + DL\)](#) | [Harvard's CS50 Courses \(AI + Python\)](#) | [Coursera's Math for ML and Data Science \(Linear Algebra + Calculus\)](#)

## EXPERIENCE

### University of Guelph

Jan 2024 - Present

*M.Sc. Research Project*

Guelph, ON

- Developing a pipeline to derive novel genome annotation insights, informing disease, genetic variability and evolution
- Profiling transposable element sequences, detailing length, classification, degradation, location, and embedded genes
- Integrating **Python**, **R**, bioinformatics tools, and **ML** for data processing, sequence classification, and model building
- Leveraging Compute Canada systems and SLURM to manage **HPC** jobs for genomic data processing and storage
- Deploying pipeline on a cloud platform, facilitating resource-efficient and convenient access for genomic researchers

### University of Guelph

May 2022 - Present

*Evolutionary Biology Researcher*

Guelph, ON

- Designed and executed an independent research report on snake venom evolution across 127 species and three families
- Analyzed proteomic and phylogenetic data in Excel and **R** to compile phylogenies and create graphical analyses
- Authoring a research paper for publication to add to the current understanding of venom and complex trait evolution

### University of Guelph

Sept 2024 - Dec 2024

*Teaching Assistant – Discovering Biodiversity (Introductory Biology Course)*

Guelph, ON

- Led weekly seminars for four sections of 30 students and provided teaching support during two weekly lectures
- Developed seminar material aligned with lecture topics, including genetics, evolution and organismal biology
- Evaluated and provided feedback on student seminar worksheets to enhance understanding and learning outcomes

## RELEVANT PROJECTS

[Augmenting EEG Classification with GAN-Generated Data \(BrainHack 2024\)](#) | [Demo](#) | *Python* Dec 2024

- Collected EEG data from our team of seven, each completing two thinking exercises, resulting in 200 000 datapoints
- Trained a Random Forest **ML** model using collected EEG data, achieving 94.8% classification accuracy on unseen data
- Augmented the dataset using a **GAN**, generating 200 000 synthetic data points from the collected EEG data
- Visualized results via Confusion matrices, ROC-AUC curves, loss plots (generator vs discriminator), and learning curves

[Evaluating Algorithms for Gene Sequence Classification](#) | *R* Nov 2024

- Assessed the performance of Random Forest versus Linear Regression models in gene sequence classification
- Developed visualizations to highlight sequence length distribution, k-mer frequency proportions, and feature importance

[Road Sign Categorizer](#) | *Python* May 2024

- Created a **DL** classifier to categorize road signs into one of 43 categories using the GTSRB dataset of 50 000+ images
- Implemented a **convolutional neural network** with pooling layers, achieving a classification accuracy exceeding 90%
- Leveraged the Python libraries TensorFlow, Scikit-learn and OS for model building and data preprocessing

[Venom Type Classifier](#) | [Demo](#) | *Python* March 2024

- Developed an **ML** classifier to predict venom types in snake species based on the proportions of 14 venom proteins
- Achieved 94% classification accuracy when given novel snake species and protein data
- Utilized Scikit-learn, Matplotlib, and Pandas to build a support vector machine classifier and visualize PCA data