Mirza Ahmadi

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SKILLS SUMMARY

- **Languages & Tools:** Python, R, Bash, Linux, High-Performance Computing (HPC), Git, HTML & CSS
- **Certifications**: Machine Learning (ML) + Deep Learning (DL) - Compute Ontario | AI + Python - Harvard CS50 | DL + Reinforcement Learning - CIFAR | Linear Algebra + Calculus - Coursera

PERSONAL PROJECTS

Enhancing EEG Classification with GANs (BrainHack 2024, SickKids) | **Demo** | ***Python*** **Dec 2024**
- Collected and cleaned EEG data from individuals performing two cognitive exercises, creating a labeled dataset
- Trained a **Random Forest** model with **95%** accuracy using **Pandas**, **NumPy**, and **Scikit-Learn**
- Generated 200 000 synthetic datapoints with a **GAN** to test if synthetic data can serve as a proxy for real data
- Visualized results using Confusion matrices, ROC-AUC curves, loss plots, and learning curves with **Matplotlib**

Evaluating Algorithms for Gene Sequence Classification | ***R (Tidyverse)*** **Nov 2024**
- Compared the performance of **Random Forest** and **Linear Regression** models in gene sequence classification
- Visualized sequence length distribution, k-mer frequency proportions, and feature importance

Road Sign Categorizer | ***Python*** **May 2024**
- Implemented a **convolutional neural network** to classify road signs into 43 categories with **90%** accuracy
- Leveraged the libraries **TensorFlow**, **Scikit-learn** and **OS** for model development and data preprocessing

Venom Type Classifier | **Demo** | ***Python*** **Mar 2024**
- Developed a **Support Vector Machine** model to predict venom type from protein data, achieving **94%** accuracy
- Utilized **Scikit-learn**, **Matplotlib**, and **Pandas** for model building and visualization of PCA data

EXPERIENCE

M. Sc. Research Project - *University of Guelph* Guelph, ON | **Jan 2024 - Present**
- Developing an **ETL** pipeline to derive genome annotation insights, informing disease, variability, and evolution
- Integrating **Python, R**, bioinformatics tools, and **ML** for data processing, sequence classification, and modeling
- Using Compute Canada systems and **SLURM** to manage **HPC** jobs for genomic data processing and storage
- Deploying the pipeline on a cloud platform to enhance efficiency and data quality for genomic researchers

Evolutionary Biology Researcher - *University of Guelph* Guelph, ON | **May 2022 - Present**
- Designed and executed an independent research report on snake venom evolution across 127 species
- Analyzed proteomic and phylogenetic data in **Excel** and **R** to compile phylogenies and create graphical analyses
- Authoring a research paper for publication to enhance our understanding of venom and complex trait evolution

Teaching Assistant (1st year Biology Course) - *University of Guelph* Guelph, ON | **Sept 2022 - Dec 2024**
- Led weekly seminars for 120 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 seminar worksheets to enhance understanding and learning outcomes

EDUCATION

M. Sc., Bioinformatics & AI (Research-Based) - *University of Guelph* Guelph, ON | **Jan 2024 - Present**
- Course: Machine Learning , Math for Machine Learning, Genomic Methods, Bioinformatics Software Tools

B. Sc., Zoology Major with Minor in French - *University of Guelph* Guelph, ON | **Sept 2019 - April 2023**