Elizabeth Campau

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# Education

## P.S.m | Degree anticipated AUGUST 2022 | Grand Valley state university

* Data Science and Analytics
* Current GPA 3.95

## B.S | 2020 | Grand Valley state university

* Major: Statistics
* Minor: Philosophy
* GPA 3.8

# Projects

## Artificial Neural Network Implementation

* Implementation of neural network from scratch in Python to identify handwritten digits. Achieved 94% test accuracy with one hidden layer.

## ID3 Decision Tree Implementation

* Implementation of ID3 Decision Tree algorithm from scratch in Python and basic visual representation of tree.

## Reinforcement Learning

* Use of Q-Learning algorithm in Python to optimize gameplay of a ‘bot’ player in a simple game. Achieved typical win-rate of >90%, tie-rate of <10%, and lose-rate of 0 against a randomly moving opponent player with a short learning period.

## Document Classification using naïve bayes

* Use of Naïve Bayes to classify documents by topic. I also analyzed the relative popularity of words across documents, and removed from analysis words which did not have sufficient popularity changes between topics, resulting in a >2% increase in accuracy of the base classifier.

## R SHINY APP for Data Visualization

* Worked in a group of 3 to create an interactive Shiny App in R to display visualizations of large amounts of data of COVID-19 cases.

## Logistic Regression using Best Subsets

* Prediction of suicide rate by country according to demographic information, using R.

## Survey Analysis with Multiple Linear Regression

* Analysis of survey data to assess academic entitlement in physician assistant students at GVSU. Included use of SAS for analysis of internal consistency of survey constructs and Multiple Linear Regression to predict academic entitlement from demographic information.

## CUDA for GPU-Acceleration

* Creation of Voronoi diagram using CUDA-based GPU-accelerated computation in C++. Achieved Speedup of >60.

## MPI for Cluster Computing

* Identification of genes which are most differently expressed between diseased and control groups using Open-MPI-based message-passing cluster computing in C++. Achieved Speedup of >30 on 60 processors.

## OpenMP Multi-Threading

* Simulation of crystal formation in three-dimensional space using OpenMP for multi-threading in C++. Each thread controlled the movements of a simulated particle in fluid. Included interactive visualization of simulated crystal.

## Survey Creation

* E-mail communications with Dr. DeKorver, Professor at Grand Valley State University, to draft a survey regarding the perceptions of undergraduate chemistry students about fear and danger in the lab. The results of this survey were later presented at a chemistry education conference in June 2019.

# Skills & Abilities

## LAnguages

* Python
* R
* MySQL
* SAS
* C++

## OTher Programming Abilities

* High-Performance Computing
* Machine Learning
  + Deep Learning

## Statistical/mathematical Methods

* Multiple Linear Regression
* Logistic Regression
* Ridge Regression
* LASSO
* ANOVA/MANOVA/ANCOVA
* Strong Mathematical background, including:
  + Mathematical foundations of Machine Learning algorithms
  + Linear algebra
  + Calculus through Calc 3

# Interests

* Biking, hiking, reading, writing poetry, and learning languages (human and computer)