

Summary

I am a Data Scientist with experience using Python, Java, C++, R, Excel and SQL. I have an undergraduate degree in Statistics, and this has provided me with a firm understanding of much of the math behind the machine learning models used today. I am currently working as research assistant for Dr. Travis Desell at the Rochester Institute of Technology while obtaining my master's degree in data science. As research assistant I am investigating applications of Dr. Desell's Evolutionary eXploration of Augmenting Memory Models (EXAMM) algorithm and optimizing it's hyperparameter search using reinforcement learning.

Education

M.S. DATA SCIENCE | ROCHESTER INSTITUTE OF TECHNOLOGY | AUGUST 2021 – MAY 2024

SPRINGBOARD DATA SCIENCE CAREER TRACK | MARCH 2020 – JANUARY 2021

B.S. STATISTICS | UNIVERSITY OF NORTH FLORIDA | JUNE 2013 – AUGUST 2015

Skills

OBJECT ORIENTED PROGRAMMING

- Python, Java, C++

DATA SCIENCE

- Python - pandas, numpy, statsmodels, sklearn, pytorch
- R - dplyr, tidyr, ggplot2, Quarto

MACHINE LEARNING

- KNN, Regression, Decision Trees, Random Forest, Gradient Boosting, SVM, K-means Clustering, Hierarchical Clustering, Mean-Shift Clustering, Neural Networks (RNN, CNN)
- Precision, Recall, Accuracy, F1, ROC, PCA, Cosine Similarity

MATHEMATICS AND STATISTICS

- Calculus I, II, III, Linear Algebra, Mathematical Statistics, Probability, Bayesian Methods, Hypothesis Testing, ANOVA, Time Series Analysis

RELATIONAL DATABASES

- SQL, MySQL, SQLite

Projects

EXA-GP: UNIFYING GRAPH-BASED GENETIC PROGRAMMING AND NEUROEVOLUTION FOR EXPLAINABLE TIME SERIES FORECASTING | AUGUST 2023 – FEBRUARY 2024

- Deconstructed complex memory cell networks into nodes with simple activation functions (sum, multiply, sigmoid, tanh, sin, cos, inverse)
- Added simple node functionality to Evolutionary eXploration of Augmenting Memory Models (EXAMM) algorithm
- Added feature to EXAMM to print human readable representations of recurrent neural networks (RNN's)
- Evolutionary eXploration of Augmenting Genetic Programs (EXA-GP) = EXAMM + simple nodes + human readability
- Compared performance of EXA-GP RNN's with evolved LSTM networks for t+1 time series forecasting using 3 large datasets
- Compared performance of EXA-GP RNN's with other modern Genetic Programming frameworks such as Jenetics (Java), EC-KitY (python), and CGP-Library (C/C++)
- Found that EXA-GP RNN's had better or comparable performance when compared to other frameworks with the added benefit of human readability
- Submitted to GECCO '24 (currently under review under anonymous authorship)

DETECTING DUPLICATE BUG REPORTS | JANUARY 2022-APRIL 2022

- Python Tools: numpy, pandas, gensim, keras, sklearn
- Used natural language processing and recurrent neural network architecture to create a duplicate bug report detector
- Our Siamese Subnet Signal Compression Manhattan Distance model was trained on labeled data provided by open-source software projects such as Mozilla, Eclipse and Thunderbird
- The SSSC Manhattan Distance model outperformed a Random Forest and Cosine Similarity baseline at various thresholds, but did not perform well when deployed for cross project classification
- <https://github.com/jared-m-murphy/Portfolio/tree/main/DuplicateBugReport>

PREDICTING READMISSION IN HOSPITAL PATIENTS | AUGUST 2021-DECEMBER 2021

- Python Tools: numpy, pandas, sklearn, matplotlib, seaborn
- Used patient data from 130 hospitals across the US to create a recidivism classifier specific to diabetes patients
- Created a preprocessing pipeline using custom heuristics to eliminate redundancy in the data
- Evaluated the performance of Logistic Regression, Random Forest, and KNN using a hyperparameter grid search and five-fold cross validation
- Best performing model was Random Forest with number of estimators equal to 400, however the max AUC achieved was .6, so more research is needed
- https://github.com/jared-m-murphy/Portfolio/blob/main/Hospital-Readmission/MurphyDSCI633_FINALDRAFT.ipynb

Employment

RESEARCH ASSISTANT | RIT | ROCHESTER, NY | AUGUST 2021 – MAY 2022, AUGUST 2023 – MAY 2024

CAPENTER/RESIDENTIAL PAINTER | SELF-EMPLOYED | HUDSON VALLEY, NY | OCTOBER 2016 – AUGUST 2021

HIGH SCHOOL EQUIVALENCY INSTRUCTOR | DUTCHESS COMMUNITY COLLEGE, POUGHKEEPSIE, NY | MARCH 2016 – OCTOBER 2016

SALES ASSOCIATE | DESIGNER SHOE WAREHOUSE, JACKSONVILLE, FL | JULY 2010 – AUGUST 2015

Awards

GRADUATED SUMMA CUM LAUDE | UNIVERSITY OF NORTH FLORIDA | AUGUST 2015

INDUCTED INTO PI MU EPSILON MATHEMATICS HONORS SOCIETY | FLORIDA ETA CHAPTER | AUGUST 2015

Volunteering

CAPENTER/GENERAL CONTRACTOR | KUNZANG PALCHEN LING (BUDDHIST CENTER), RED HOOK, NY | JANUARY 2016 – SEPTEMBER 2019

References

DR. TRAVIS DESELL | ASSOCIATE PROFESSOR | RIT | TJDVSE@RIT.EDU | (518) 867-1054

DR. PING SA | PROFESSOR | UNF | PSA@UNF.EDU | (904) 620-3729

MATTHEW FORAKER | MANAGER | KUNZANG PALCHEN LING | (845) 453-7690