Nicholas Barrett

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EDUCATION

Master of Science, Applied Mathematics and Statistics, Sep 2020-May 2022,
Advanced Graduate Certificate in Data and Computational Science, Jan 2021- May 2022
Stony Brook University, The State University of New York
GPA 3.4/4.0

Bachelor of Science, Mechanical Engineering, Sep 2015-May 2019, Focus in Control Systems
University at Buffalo, The State University of New York
GPA 3.0/4.0   **Senior GPA 3.4/4.0**

WORK EXPERIENCE

Design Engineer, Curtiss Wright Corp. at Target Rock, May 2019 - Aug 2020
Professional Reference: **Will Velkoff, PE,** Design Engineering Manager,
Contact Info, wvelkoff@curtisswright.com, 1.631.396.4544

- Performed design and analysis of valves and actuators for use in nuclear systems.
- Design and development of new category of metal seated ball valve design for use in high temperature and pressure environments in nuclear plants and submarines.
- Performance of finite element analysis and computational fluid dynamic analysis for validation of mathematically derived models and estimations for existing and new valve designs.
- Design of fixtures and tooling to assist with valve/actuator pressure testing and quality control efforts.

PROJECTS (Reports and Code available)

Data Analysis & Modeling

R/R-Studio
- Genetic analysis to determine correlates for outcomes with ~2000 genetic indicators and 6 environmental variables. Included data imputation methods, building, and evaluating regression models including up to third order interaction terms. Modeling included using ANOVA, Ridge regression, LASSO, AIC/BIC for selection.
- Re-implementing standard R tools for statistical analysis e.g., chi tests, F tests, Monte Carlo integration, ANOVA, Wilcoxon rank test, correlation coefficients, generating random variables and distributions
- Implementation of Machine/Statistical Learning algorithms and data modeling like neural networks, random forests, subset methods, clustering methods and data utilization methods like bagging/bootstrapping and cross validation.

Python
- Constructed simulation environment implementing the "Intelligent Driver Model" for road traffic analysis with different driver behavior distributions. Report Included on GitHub.
- Deep Q-Learning Network and Car simulator built from Keras and a custom environment based Open AI's Gym to train a deep learning model utilizing the Q-learning framework developed by Google DeepMind. Trained convolutional DQN on "sight" vector from car agent in a custom developed environment. Used reward signals based on survival and crashes to train.
- Used a 2D convolutional network in TensorFlow to train a sudoku solver using data found on Kaggle.com, by predicting the most likely next number and iterating.

Data Visualization
- Visualization dashboard (video link) for investigative data analysis on high dimensional US Wellbeing data aggregated from multiple data sources. Built with python and plotly dash.
- Experience using visualization libraries plotly, and ggplot2 in R, and ggplot, matplotlib, and plotly in Python. Some experience using d3.js data driven documents library in javascript.