

# David Munoz Constantine

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## Education

**Portland State University** | Portland, OR

M.S. **Computer Science, Machine Learning and Artificial Intelligence**

Graduation, December 2020

GPA, 4.00

**George Fox University** | Newberg, OR

B.S. **Engineering, Computer and Electrical** concentration

Graduation, May 2015

GPA, 3.30

## Skills

**Software:** Python, Ruby, C, Javascript/CSS/HTML, Matlab

**Frameworks & Technologies:** Ruby on Rails, Keras, Git, Visual Studio

**Competitions:** ACM Programming Contest (2015), MIT Battlecode (2019), WCH Hackathon (2019), Professional Tennis

## Experience

### Graduate Technical Intern

October 2020 – December 2020

Intel

Hillsboro, OR

- Using Python, I implemented and tested various feature extraction functions for unstructured log files. This included analysis of millions of lines of log text and closely working with domain experts to extract relevant features.
- Using **data science techniques**, I analyzed, visualized, and formatted the most important features from the log files for them to be used in a machine learning classification model.

### Researcher

August 2020 – Present

Hudson & Thames Quantitative Research

Portland, OR

- Using Python, I **read, implemented, tested, and wrote documentation** for leading research publications in machine learning and data science. It resides in their open-source python package, *mlfinlab* which has 1.7k stars in Github.
- Tests were written using the unittest framework. Documentation was written on Sphinx's Read the Docs. Additional documentation and background knowledge was written in IPython notebooks.

### Hardware Design Engineer

July 2015 – June 2018 / June 2019 – September 2019

Teradyne

Tualatin, OR

- Design Lead.** Modernized Teradyne's proprietary system control board in charge of system-wide functionality and safety. Thoroughly validated it to guarantee reliability and backward compatibility due to the impact on their business.
- Resolved one of the biggest bottlenecks for the group. Experienced resources were underutilized due to their knowledge of outdated diagnostic tools for PCB validation. By developing and implementing a user-friendly interface, I was able to **reduce debugging time by 300%** and leverage our experienced resources on mission-critical tasks.

## Projects

### Progressive Web Apps Development

- Using Ruby on Rails, I **built several web apps** for personal use to challenge myself and learn new frameworks.
- Used a material design theme, accessibility friendly design, UX, and PWA best design practices.
- Built from the ground up and deployed in Heroku using AWS for serving images.
- Using Rails' built-in test environment, I **designed tests and integration** to verify all functionality.
- My latest deployed site receives **over 200 weekly visitors**.

### Artificial Intelligence Applications

- Using Python and Matlab, I **implemented several machine learning algorithms** to classify and predict data.
- They include neural networks, k-means, k nearest neighbors, SVM, and reinforcement learning.
- Used evolutionary algorithms to optimize various **multi-dimensional and complex** problems and functions.
- Used complete and local state-space search to find solutions to NP-Complete problems.

### Low-Level Operating System Modifications

- Modified the Xv6 operating system** source code to learn more about OS internals.
- Using C, I added **new system calls** and a new file system protection scheme based on UNIX octal permissions.
- Modified the processes scheduling algorithm from FIFO to a multilevel feedback queue scheduling (MLFQ) approach.

## Publications

**Munoz Constantine, D.,** Tymerski, R., & Greenwood, G. (2020). Differential Evolution Optimization of the Broken Wing Butterfly Option Strategy. *Technology and Investment*, 11, 23-45