Alexander J. Federici

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Education

University of Illinois at Urbana-Champaign | B.S. in Computer Science | 3.58 / 4.00 **Expected May 2022**

- Midwest Hyperloop, Software development team.
- Alpha Tau Omega Fraternity member.

Coursework

- Data Structures, Computer Architecture, Systems Programming, Algorithms and Models of Computation, Numerical Analysis, Statistics and Probability 1, Applied Linear Algebra, Machine Learning, Discrete Mathematics.

Work Experience

Yahoo! | *Software Engineering Intern* **Champaign, IL | May 2019 – August 2019**

- Efficiently allocated resources in the Presto cluster by designing a new backend pipeline in Java.
- Utilized the Hadoop stack to automate running Hive queries on grid.
- Tested my work by running two pipelines in parallel and by sending patch and get requests to various SQL databases.

MIT Lincoln Laboratory | *Teaching Assistant* **Cambridge, MA | May 2018 – August 2018**

- Lectured on converting an analog signal to digital through manipulating bit depth and sampling rates.
- Developed Jupyter Notebook tutorials for a twitter data sentiment analysis CNN rivaling the top submission on Kaggle.
- Optimized matrix multiplication in a Python auto-gradient library.
- Led students in developing their own Amazon Alexa Skills built on concepts from previous weeks (e.g. Song Recognition).

TransMarket Group | *Quantitative Trading Intern* **Chicago, IL | October 2017 – May 2018**

- Worked on increasing performance at the US Treasury Bonds desk using Python and SciKitLearn.
- Analyzed data in Python via Numpy, Pandas, and Matplotlib to determine optimal machine learning techniques.
- Wrote a script to both update the company database with improved data formats and to send weekly email updates.

Projects

C++ Iron Man Simulator **November 2018 – January 2019**

- Used the OpenCV and OpenFrameworks libraries for image processing algorithms and graphics.
- Devised a method combining difference frames and contour detection to overcome false positives.
- Acquired code organization skills by using appropriate OOP and C++ design patterns and styles.

High Frequency Trading Bot **March 2018 - Present**

- Leveraged Amazon Relational Database services to store live feed data via webscraping and Python's mysql.connector.
- Implemented volume analysis and simple technical indicators (e.g. moving averages, RSI) for plots.
- Currently prototyping with a Support Vector Machine Model for making trade decisions.

Math Utility IOS Application. **May 2020 - Present**

- Working on an app to recognize written symbols as math equations, supporting automatic solving and graphing.

Technologies and Languages

Python; C/C++; Java; SQL; HQL; HTML/CSS
PyTorch; Hadoop; Amazon Web Services (RDS, Lambda, API); Bash; GitHub; SolidWorks; Git; Unix Environments

Awards

DRW Data Science Finalist: Placed in the top 5 out of 83 competitors on the coding site, Camelot.ai, sponsored by DRW.
Best Hack using open public health data by Coding It Forward – Created a medical AI web-app at TreeHacks Feb 2019
2nd Place at MIT BWSI Showcase: Developed and presented Alexa Skills for voice and face recognition on the Amazon Echo.
1st Place IHSA Chess State Championship: Member of the Illinois Mathematics and Science Academy's 2017/2018 team.