Alexander J. Federici

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Education

University of Illinois at Urbana-Champaign | B.S. in Computer Science | 4.0 / 4.0   **Expected May 2021**
- Association for Computer Machinery (ACM), SigAI project team.

Illinois Mathematics and Science Academy | High School Diploma   **June 2018**
- Received college credit for 3 Math and 2 CS courses on top of receiving credit for 7 AP exams.
- Captain of the varsity basketball team and member of the 2017 Illinois State Championship chess team.

Work Experience

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 an autograd library's matrix multiplication method by determining an optimal parenthetical ordering for the operations in Python.
- 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**
- Created a predictive model for off-the-run 3s5s US Bonds using PCA and regression tools within the SciKitLearn library.
- 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

High Frequency Trading Bot   **March 2018 - Present**
- Leveraged Amazon Relational Database services to create and connect to a MySQL database instance to query and modify data using Python (mysql.connector and sqlalchemy).
- Created a crypto currency and stock trading bot that uses webscraping to fetch live feed data.
- 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.

Flameless | Illinois Mathematics and Science Academy   **September 2017 - April 2018**
- Wrote code in C, utilizing Arduinos and custom parts, to create a miniature device that extinguishes kitchen fires.
- Won 2nd place at PowerPitch and 3rd place at NextLaunch, both pitching competitions, for the novel idea and prototype.
- Featured for our work in this article: *https://chicagoventuremagazine.com/2018/06/15/top-of-the-list.*
- Founded this safety product startup with two other high school students at IN2, an innovation center in Aurora, IL.

C++ Tower Defense Game   **November 2017 - May 2018**
- Used Direct2D API to develop a graphics library for the program.
- Created a path finding intelligence for both the enemies and defensive units.
- Acquired code organization skills by using appropriate OOP design patterns.

Languages and Technologies

Languages - Python; C++; Java; C#; JavaScript; PHP; MySQL; HTML/CSS
Technologies - Amazon Web Services (RDS); Git Bash; GitHub; SolidWorks

Awards

DRW Data Science Finalist: Placed in the top 5 out of 83 competitors on the coding site, Camelot.ai, sponsored by DRW.
#1 Midwest Team, Cyber Forensics: Invited to compete nationally in NYU's High School Forensics Challenge.
2nd Place Abbott CyberHack 2018: Analyzed PCAP files and reverse engineered JavaScript programs for this CTF.
Google Foobar Challenge: Reached stage 3/5 on Google's invitation-based coding competition.
2nd Place at MIT BWSI Showcase: Developed and presented Alexa Skills for voice and face recognition on the Amazon Echo.