Alexander J. Federici

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Education

University of Illinois at Urbana-Champaign | B.S. in Computer Science | 3.65 / 4.00 **Expected May 2022**

- College of Engineering Dean's List
- Association for Computing Machinery member
- Alpha Tau Omega Fraternity Career Development and Alumni Relations Officer

Work Experience

IMC Trading | *Software Engineering Intern* **Chicago, IL | June 2021 – August 2021**

- Implemented PNL critical execution and messaging logic, redesigning many Java classes to support a new paradigm.
- Collaborated across teams and roles to design an intuitive API and GUI for the newly designed feature.

Citadel | *City Scholars Software Engineering Intern* **Chicago, IL | January 2021 – May 2021**

- Integrated Datadog based alerting by analyzing historic component latency, allowing for visibility into system health.
- Added C++ logging and designed regex filters to enable Splunk alerting.
- Improved post-trade robustness by creating a code coverage script of Bazel and Linux filesystem commands.

The Trade Desk | *Software Engineering Intern* **Ventura, CA | May 2020 – August 2020**

- Designed new MsSQL tables and stored procedures to materialize state in the log processing system, reducing compute time.
- Aided other teams in processing files with Spark by creating a Python Airflow Interop.

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

- Designed a new backend pipeline in Java, increasing UI responsiveness.
- Repurposed NLP techniques to perform histogram aggregation and array operations, enabling
- Utilized the Hadoop stack to automate running Hive queries on grid, reducing load on the Presto cluster by 50%.

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

- Developed Jupyter Notebook tutorials for a twitter data sentiment analysis CNN rivaling the top Kaggle models in precision.
- Optimized matrix multiplication in a Python auto-gradient library.

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

- Analyzed data in Python via Numpy, Pandas, and Matplotlib to determine optimal machine learning techniques.
- Updated our database with improved data formats and automated email updates to the US Treasury Bonds desk.

Featured Projects

C++ Ray Tracing Library **March 2021 – May 2021**

- From scratch library supporting multiple perspectives, zoom, and mesh renders.
- Benchmarked and designed optimization techniques, reducing runtime by 20x for 100,000 objects.

C++ MapReduce Clone **October 2020 – December 2020**

- Fault tolerant distributed system with leader election, joining, and file replication, with a throughput of 12mbps.
- Coordinated map reduce, comparable to Hadoop up to 15,000 keys.

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 reduce false positives by 90%.

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 public health data by Coding It Forward: Created a medical AI web-app at TreeHacks Feb 2019.
Hyperloop Pod Competition Finalist: Software Developer for Midwest Hyperloop, finishing top 20 globally.
2nd Place Abbott CyberHack 2018: Analyzed PCAP files and reverse engineered JavaScript programs for this CTF.
1st Place IHSA Chess State Championship: Member of the Illinois Mathematics and Science Academy's 2017/2018 team.