Daniel Bohen

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Education

University of Southern California (GPA: 3.6) **Aug. 2021-May 2025**
Bachelor of Science in Computer Science, Minor in Artificial Intelligence Applications *Los Angeles, California*

Experience

Undergraduate Machine Learning Researcher **Aug. 2022-Present**
USC Information Sciences Institute *Los Angeles, California*

- Designing and implementing a neurosymbolic model focused on explainable context detection for decisions in safety-critical environments, specifically supporting Neuroscientists in deep brain simulation and neurological analysis
- Attempting to model the human experience through relating multimodal sensor data (representing a subset of human sensory channels) to corresponding neural readings in order to accurately estimate the state of the brain
- Working with knowledge graphs to synthesize model outputs from different sensor modalities into a single usable set of symbols. Modifying unity based embodied ai simulators to support additional modalities necessary for model training

LLU Volunteer Researcher **May 2022-Present**
Loma Linda University Medical Center *Loma Linda, California*

- Using scikit-learn, keras, and tensorflow to support physicians looking to use machine learning in their research
- Utilized python and pandas to automate data processing within the departments of Orthopedic Surgery and Cardiology
- Developed automation script in python to improve research project output by an estimated 75%, as it eliminates the manual labor of data collection, cleanup, and analysis. Script has facilitated the rapid completion of 29 projects thus far

Undergraduate Cybersecurity Researcher **May 2022-Aug. 2022**
USC Information Sciences Institute *Los Angeles, California*

- Worked on a llvm compiler tool to map between source code, llvm IR, and machine code through use of C++ passes, llvm-readobj, clang++, and gdb. Goal is to analyze vulnerabilities across all levels of the compilation process
- Modifying C++ directed fuzzers to find and benchmark edge cases, in order to reach them more efficiently

BOTS Computer Science Teaching Assistant **Sep. 2021-May 2022**
USC Viterbi School of Engineering *Los Angeles, California*

- Communicate basic coding concepts in engaging and simple presentations for 2 dozen elementary school teachers in a year long series of professional development sessions. Assist students during classroom lesson implementations
- Develop and execute programs for the Root and Sphero robots to demonstrate their capabilities to students

Projects

Changepoint Detection & Momentum Trading | *Python, pandas, numPy, SciPy* **May 2022**

- Lead a team of six undergraduate and graduate students in developing a momentum investing strategy augmented with a changepoint detection algorithm, Achieved consistent returns averaging 8% above the S&P 500 over 14 years of backtests
- Uses long short-term memory deep-learning to simultaneously learn both trend estimation and position sizing

CS104: Data Structures & Algorithm Projects | *C++, Docker* **Apr. 2022**

- Implemented templated BST, AVL, Heap, and Hashmap data structures in C++. Ensured optimal runtime of each
- Implemented a search engine using sets and maps, allowing for O(log n) queries, and developed an efficient puzzle solver by implementing the A* algorithm, both accessible through the CLI

Pairs Trading Algorithm | *Python, pandas, numPy* **Dec. 2021**

- Developed a pairs trading algorithm, focusing on fundamental analysis of co-integrated/correlated security pairs. Achieved a 22% return. Presented to a panel of quantitative engineers including the former SEC chief economist

Technical Skills

Languages: *(Proficient):* C, C++, Python [scikit-learn, tensorflow] *(Familiar):* Java, JavaScript [Node, React], SQL, Bash
Developer Tools: Google Cloud Platform, VS Code, Git, Docker, Clang, g++, JupyterLab, Linux (Ubuntu, Manjaro)

Relevant Coursework

- CSCI 201: Principles of Software Development
- CSCI 104: Data Structures and Object Oriented Design
- EE 109: Introduction to Embedded Systems
- CSCI 270: Algorithms and Theory of Computing
- CSCI 103: Introduction to Programming
- ITP 125: Introduction to Information Security

Leadership & Involvement

USC QuantSC: Co-President (Fall 2022), Project Manager (Spring 2022), Developer (Fall 2021)
Viterbi School of Engineering Deans List (Jan. 2022)
USC Leadership Merit Scholar