

Liam Strand

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EDUCATION

BS in Computer Science, Tufts University School of Engineering (ABET) GPA: 3.97/4.00 2020 - 2024
Data Structures/Algorithms, Machine Structure and Assembly Language Programming, Software Engineering, Concurrent Programming, Parallel Computing, Computational Theory, Programming Languages, Cybersecurity, Machine Learning, Spatial Audio Software. Spring 2024: Operating Systems, Quantum Computing, Network Security, Computer Engineering. (**Dean's List 7/7 semesters**)

WORK EXPERIENCE

AeroVironment, Inc. | Software Engineering Intern | Wilmington, MA Summer 2023

- Demonstrated that costs of aerial robotics product can be dramatically reduced by transitioning to COTS hardware.
- Led hardware bringup and software integration effort. Created development pipelines and containers using Docker and GitLab.
- Led porting of large, high-performance C++ applications to new distributed hardware environment.
- Refactored communication protocol to improve design and resiliency, and resolved complex Linux kernel driver incompatibilities.

Bioinformatics & Computational Biology Group, Tufts University | Summer Scholar | Medford, MA Summer 2022

- Led multi-institutional team. Delivered syntax validation, color highlighting, and auto-completion features.
- Implemented client/server architecture in Python, with a well-documented API to support new language features and editors.
- Utilized beta tester feedback and automated regression testing frameworks.
- Presented [manuscript](#) at MTSR 2023. Honorable Mention for CRA Outstanding Undergraduate Researcher. ([Demo](#)) ([Repository](#))

Computer Science Department, Tufts University | Teaching Assistant | Medford, MA Fall 2021 - Present

- Design and lead labs and review sessions for C and C++ machine structure and assembly language courses.
- Teach debugging and performance analysis strategies using tools such as `gdb` and `valgrind`.
- Collaborate with faculty to develop course infrastructure, assessments, and assignments.

Hither Creek Boatyard | Data Collection/Analysis | Madaket, MA Summer/Winter 2018 - 2021

- Created and installed Point-Of-Sale system backup network allowing business to operate when primary internet service fails.
- Designed Yamaha outboard engine data collection methodology. Gathered, analyzed, and synthesized data for 18 engine models.
- Created accessible Yamaha outboard engine diagnostic charts. Recovered and transferred GPS chartplotter data.

PROJECTS

Rust Boggle Solver: [Ruggle](#) 2023

Designed and built a highly optimized Boggle solver in Rust utilizing a serializable prefix tree (trie) data structure to encode a lexicon, a pruning graph-traversal algorithm, and a custom visualization system to display words as they appear on the board.

Assembly Emulator: [VM Profiling](#) 2022

Built a simulated architecture emulator in C, and vastly improved performance using modern profiling techniques. ([Demo](#))

Concurrent Simulations: [MetroSim2](#) and [on-the-road-again](#) 2022

Developed fully concurrent subway simulation in Java using communicating threads to represent trains, passengers, and stations. Designed and built traffic simulation using CSP in Erlang with Python visualization, communicating over serialized I/O. ([Demo](#))

Java Testing Framework 2022

Designed testing infrastructure: unit testing library, test generation framework, fluent assertion domain-specific language, test runner.

Python CLI Concurrent Queue Manager: [HalliganHelper2](#) 2021

Developed CLI to manage FIFO queue of students requesting TA assistance in Python. Used shared files and file locks to prevent change conflicts. CLI automatically invokes relevant commands and imposes serialization. ([Demo](#))

iOS Data Scraping App: [IFR Plate Scrape](#) 2021

Built airport mapping app in Python using HTTP requests to retrieve FAA data, and BeautifulSoup to extract and present relevant information to user. Ported to iOS using Swift, leveraging built-in URL management and SwiftSoup. ([Demo](#))

iOS Data Logging App: [Log Your Catch](#) 2020

Built iOS app to capture and record data to support fishery management using Apple Location Services and Google Firebase database services. Completed architecture design, UI design, system integration, authentication, and beta testing.

SKILLS

Languages: Assembly, C, C++, Erlang, Java, \LaTeX , Markdown, Python, Rust, StandardML, Swift, Unix/Shell Scripting
Tools/IDEs: Apple SDKs, Docker, `gdb`, `git`, GitHub, GitLab, GPU/CUDA, Jira, Linux/Unix, `valgrind`, VSCode, Xcode
Experienced In: Agile Development, Concurrent/Parallel Programming, Hardware Bringup, Profiling, Testing Methodologies

COMMUNITY

JumboCode	Leading team-driven application development for local non-profit organizations.
Faculty Interviewer	Asked to help assess candidates for tenure-track teaching faculty positions at Tufts University.
Engineering Ambassador	Selected to advise incoming and first-year engineering students.
Sustainable Nantucket	Migrated critical data from failing Windows 2007 server, verified data accuracy/accessibility.
Robotics	Led skills training: soldering, metal fabrication, carpentry, robot design, additive fabrication, and electronics. Mentored new team members. Coached new leaders. Created legacy training program.
Community Research	Collaborated on A1 vs A2 ruminant genetics study and planned/executed soil carbon testing at small sustainable dairy farm.

PASSIONS

Theatre	Short Play Festival Reader/Judge: 2020 - Present
Choir	Concert and Chamber Choirs (Bass): 2016 - Present
Ensembles	Jazz/Rock Ensembles (Keyboard): 2015 - Present
Classical Piano	Certificate of Merit Awards (through Level 6)
Improvisation	MTAC Improvisation Festival (Piano)
Musical Direction	The Requiem Project (Founder and Director)

REFERENCES

References available upon request.