

JACK LEIGHTCAP

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EDUCATION

Northeastern University Boston, MA

May 2022

Bachelor of Science in Computer Engineering · Mathematics and Computer Science, minors · GPA: 3.98
Dean's List all semesters · Lawrence Award, highest GPA in year (physics department)

Relevant Courses:

Microprocessor-based Design, Fundamentals of Digital Design and Computer Organization, Computer Systems, Embedded Design, Fundamentals of Networks, Fundamentals of Electronics, Fundamentals of Computer Science 2

Cambridge University Cambridge, United Kingdom

August 2019

Pembroke-King's Summer Programme: Young Global Leaders Scholarship · Northeastern GEO Grant

SKILLS

Software

Proficient: GNU/Linux, L^AT_EX, git, shell scripting, Makefiles
Familiar: Simulink, SPICE, EAGLE, SolidWorks, AutoCAD

Programming

Proficient: C, C++, Java, Python, Racket
Familiar: Go, AMD64 Assembly, MATLAB, Wolfram Mathematica

Miscellaneous

Classical piano, viola, music typesetting, origami, bread making, electronics, art history

PROJECTS

Classical Scores Project

2017 - Present

- Run request-based YouTube channel dedicated to sharing scores and recordings of obscure or underappreciated classical music. Grew channel to 4 million total views and 12 thousand subscribers.
- Automated video editing with ongoing project *ScrollingScore* - image processing with Python, and video production with FFmpeg shell script frontend.
- Engraving of manuscripts in Lilypond, a T_EX-derived music typesetting language.

Cimulink

Embedded Design, Fall 2019

- Boolean Algebra expression reducer written in C.
- Parsed Boolean Algebra S-Expression into Abstract Syntax Tree, and reduced expressions using a given set of axioms.
- Implemented instantaneous evaluation on Xilinx Zynq-7000 SoC with system I/O, where input is given by switches, and output is represented on LEDs.

MBTA Green Line Speedrun

March 2019

- Used brute-force Travelling Salesman algorithm to determine the shortest possible path which visits all stops of the MBTA Green Line. Executed path across multiple attempts with a personal best time of 2:37.

hmalloc

Computer Systems, Fall 2019

- A thread-safe bucket-based memory allocator written in C, designed to be faster in common use than the C standard library malloc.
- Optimization of data structures, asymptotic complexity, and thread-safety mechanisms.

L^AT_EX Transcriptions

2018 - Present

- Transcribe all lecture notes into L^AT_EX for personal clarity and as a teaching aide for classmates.
- Highly refined workflow to bring transcription rate close to handwriting rate with vim and shell scripting.
- Expanded into popular .tex templates for note taking, homework submissions, and labs.

EXPERIENCE

Research Assistant, NUCAR

Spring 2020

Research Assistant in Northeastern University Computer Architecture Research Lab. Learn Go and Instruction Set Architectures for work on RISC-V instruction set simulator.

E-Board, Wireless Club

Spring 2020

- Ham Apprentice in Northeastern Wireless Club. Designed and ran Linux, L^AT_EX, and git workshops; test for ham radio licensing; lead ham radio study sessions; and learn club's ham radio equipment.
- Project Lead for *Airlights*, an LED strip interface in club space. Design of PCB with aid of senior club members.