

# MATTHEW F. HOFFMAN

92 ½ Dayton St., Quincy MA 02169  
508-498-0734 • [matthew@hoffmain.com](mailto:matthew@hoffmain.com) • <https://hoffmain.com>

## EXPERIENCE

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### Dell Technologies, Hopkinton MA

Software Engineer II

June 2021 – June 2024

- Developed backend services and API with Go, Kubernetes, and Docker for cloud data storage platforms
- Developed Linux driver compatibility features in C for modular hardware components of platforms (SSDs, HDDs)
- Managed CI/CD pipelines of C, C++, Go, and Python codebases with AWS, Jenkins, and Git
- Performed Agile development with JIRA and Confluence tools as a trained scrum leader and product owner
- Designed automation scripts in Python and Go to simulate hardware issues and validate recovery procedures
- Conducted routine physical tests and part replacements for quality assurance of NVMe storage platforms
- Used MATLAB and Jupyter notebook for manual testing and validation of electrical components

Storage Graduate Intern

June 2020 – September 2020

- Developed drivers in C for USB devices
- Verified device configurations using Ansible

### Draper Laboratory, Cambridge MA

Machine Intelligence Co-op

January 2020 – June 2020

- Developed SQL database for Apache Kafka data feeds from flotillas of autonomous ocean buoys
- Used MATLAB, Jupyter notebook, and Kepler.gl to create data products from geospatial and environmental data
- Implemented cloud-deployable containers using Docker

### Northeastern University, Boston MA

Teaching Assistant, CS 1800 – Discrete Structures

Fall 2017, Fall 2019

- Led weekly recitations and assisted students in completing problem sets
- Graded weekly quizzes and written homework assignments for various professors
- Tutored students in various topics of finite mathematics and probability

Course Assistant, CS 2510 – Accelerated Fundamentals of Computer Science II

Spring 2018

- Graded and provided feedback on daily Java assignments
- Instructed students in object-oriented design patterns
- Guided students during weekly lab sessions
- Tutored students participating in an accelerated course of study

### Waters Corporation, Milford MA

Software Engineering Co-op

July 2018 – December 2018

- Implemented environment for automated testing of C++ firmware on HPLC instruments
- Acted as software architect for integration testing framework using pytest (Python)
- Created proprietary plugins to modify framework behavior
- Developed networking features on instruments for remote access using JSON to replace protocol buffers
- Participated in daily scrums in a system of Agile software development

## EDUCATION

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### Northeastern University, Boston MA

September 2016 – May 2022

Master of Science in Electrical and Computer Engineering

GPA: 3.53/4.00

Bachelor of Science in Computer Engineering and Computer Science

**Masters' Concentration:** Computer Systems and Software

**Honors:** BS/MS Program, Dean's List, Honors Program

**Affiliations:** American Institute of Aeronautics and Astronautics, Beta Gamma Epsilon Alpha Chapter – Executive Board, Habitat for Humanity, Resident Student Association Hall Council

## PROJECTS

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### Artificial Directive Assistant (ADA)

May 2024 – Present

- Designed a modular Python framework for developers to create custom multimodal AI assistants
- Developed support for both local LLMs and common generative-AI APIs (OpenAI, AWS, Azure, Gemini)
- Implemented audio enabled (speech-to-text and text-to-speech) coding assistant using ADA framework tools
- Developed automated fine-tuning features triggered by ADA's internal, multimodal self-evaluation
- Deployed backend server (Flask) and frontend UI (React.js) through AWS EC2 instances

### DeepLift Capstone

Spring 2021

- Developed a full-length, camera integrated workout mirror for weightlifting
- Designed computer vision model for tracking body during workout

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|---|-------------|
| <b>TZSlipy Program Slicer</b>   | Spring 2021 |
| - Developed a security aware refactoring tool for Python based on TZSlicer  |             |
| <b>Word2vec Product Recommendation Tool</b>   | Fall 2020   |
| - Created a tool to analyze purchase history and find similar products using vector embeddings                                |             |
| <b>High Performance Computation Boston</b>  | Fall 2019   |
| - Designed a low-cost computer cluster to compete in an HPC performance / price competition                                   |             |
| <b>Dungeons and Dragons DBMS</b>  | Summer 2019 |
| - Designed a MySQL database to record and control Dungeons and Dragons campaign elements                                      |             |
| - Created Django web application to interface with database   |             |
| <b>Dimensionality Reduction and Supervised Learning</b>   | Spring 2019 |
| - Wrote Python program to perform principal component analysis on data sets   |             |
| - Performed cost-benefit analysis of PCA as a preprocessing technique for neural networks                                     |             |
| <b>JSwing Seam Carver</b>   | Spring 2019 |
| - Created JSwing windowed UI application that uses liquid rescaling to resize images as an alternative to cropping or scaling |             |
| <b>Sudoku Solver and GUI</b>  | Fall 2018   |
| - Designed algorithm in Python to solve Sudoku puzzles using the strategy design pattern                                      |             |
| - Created GUI for program using Tkinter   |             |
| <b>Analog/Digital EKG System</b>  | Fall 2017   |
| - Combined low-pass and high-pass filters to measure heart activity by placing electrodes on skin                             |             |
| <b>Knock-Sequence Triggered Door Opener</b>   | Summer 2017 |
| - Used Arduino piezoelectric sensors to detect knocks on a door   |             |
| - Utilized a Raspberry Pi to trigger Sparkfun motors to open door from a specific sequence of knocks                          |             |
| <b>Wiimote-Controlled Robotic Arm</b>   | Spring 2017 |
| - Developed driver in C++ to read accelerometers from a wireless Wiimote on a ZedBoard  |             |
| - Used Simulink to generate PWM signals from the ZedBoard's embedded FPGA and GPIO to control a robotic arm                   |             |

## PUBLICATIONS

*Renewable Energy Generation from Footsteps using Piezoelectronics*

Bala Maheswaran, Ryan Dent, **Matthew Hoffman**, Molly Sharpe, Zachary Stern, Daniel Trapp  
2017 ASEE Northeast Section Conference

## SKILLS

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|---------------------------|--|
| <b>Programming</b>        | Python, C, C++, C#, Go, Java, JavaScript, SQL, NoSQL, MATLAB, Verilog, Kotlin, HTML, CSS, ACL2, Assembly |
| <b>Software/Libraries</b> | Git, Linux/Unix, Kubernetes, Docker, AWS, Azure, Jenkins, Flask, Django, React.js, Apache Spark, Unity   |
| <b>Electronics</b>        | FPGAs, Digital Multimeters, Oscilloscopes, Raspberry Pi, Signal Generators, Pinsetters                   |

## PERSONAL STATEMENT

Design twice, code once.

It's understood by developers that code is read more often than it is written. This is only partially true, as it only applies to well-designed code. Poorly programmed applications are written, rewritten, and eventually redesigned on the fly. Quality programs are created by knowing what to do before you start typing, and what to stop yourself from doing when things don't run on the first go.

Test-driven development is how I channel these core values into my work ethic. An application that will go on to be successful starts with a 0 percent pass rate on every test you have written, because the tests should exist before you even have a program. Otherwise, you will be moving the goalpost throughout development by trying not to "break" anything instead of making it work the way you always intended.

*"The first 90 percent of the code accounts for the first 90 percent of the development time. The remaining 10 percent of the code accounts for the other 90 percent of the development time."*

—Tom Cargill, Bell Labs

Realistically, projects don't always go exactly as planned due to unforeseen changes. However, you can mitigate these circumstances by taking deliberate steps to make your work not future proof, but timeless.