

JACOB HOFFMAN

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Portfolio Website - <https://jacobhoffman.xyz>

FORMER EDUCATION / COURSEWORK

- B.S. In E.C.E. @ Carnegie Mellon University (2020)
- Teaching Assistant @ Carnegie Mellon University
- Dean's List Spring 2018
- (15-410) Operating System Design And Implementation
- (18-461/661) Intro to Machine Learning (Graduate)
- (15-351) Algorithms and Advanced Data Structures

WORK

- **IBM | Artificial Intelligence Engineer | November 2021 – August 2022**
Developed advanced Natural Language Processing models for the APEL U.S. Navy semantic search engine using transformers (BERT, RoBERTa), Contextual Question Answering architectures, and transfer learning with HuggingFace and PyTorch. Built and evaluated deep learning pipelines for underwater object detection and classification, exploring U-Net segmentation architectures for image data and advanced signal processing techniques (FFT, digital filtering) on image datasets. *Classified*
- **Johns Hopkins Applied Physics Laboratory | Data Scientist | May 2021 – November 2021**
Implemented and integrated multiple state estimation and tracking algorithms, designing ensemble filter architectures to rigorously test and benchmark against existing contractor solutions. Applied advanced control systems methods—including state estimation, feedback mechanisms, and filtering theory—to validate algorithm implementations based on domain expert (SME) specifications. *Classified.*
- **Greenstar Group | Software Contractor | December 2020 – April 2021**
Developed full stack technology for Sentact LLC. (healthcare) and Cardiff, Provins & Angel LLC. (finance)
- **Uncommon Core | Software Engineer | November 2019 - November 2020**
Developed an automatic grading API incorporating techniques such as Hough Line Transforms, Gaussian Blur and Convolutional Neural Networks. Moved the team onto a Google Cloud solution utilizing Docker and Kubernetes.
- **CMU Dept. Of ECE | Teaching Assistant For (Graduate) Introduction To Machine Learning | Spring 2020**
Taught graduate students fundamental machine learning techniques such as Linear Regression, Naïve Bayes, Logistic Regression, Multiclass Classification, SVMs, Nearest Neighbors, Decision Trees, Ensemble Methods, Neural Networks, Clustering, PCA, Online Learning, and Reinforcement Learning.
- **CMU Dept. Of ECE | Theoretical Machine Learning Researcher | Spring 2020**
Implemented various machine learning methods to classify children's stages of sleep, as well as detect health anomalies given recorded brain waves and vitals using a medical dataset in which CMU has exclusive access to.
- **General Motors | Embedded Controls Intern | Stability Of Vehicle | Summer of 2019**
Applied control theory concepts to design a brake system for a trailer. The system included ABS and ESC safety features. The system detected instability of a trailer in real time and dampened trailer sway by engaging the brakes.

SKILLS

Programming Languages: Python, Rust, Go, C++, C, Java, Kotlin, MATLAB, R

Machine Learning & AI: PyTorch, TensorFlow, scikit-learn (Pandas, NumPy), LangChain, U-Net, BERT, Transformers

Backend & Web Development: FastAPI, Flask, React, JavaScript (JS), HTML5, CSS3, PHP, gRPC, REST APIs, Selenium

Cloud & Infrastructure: AWS (EC2, S3, Aurora, Fargate, Glue, Athena, VPC, Route 53, Parameter/Secret Store, OpenSearch), Google Cloud (GKE Autopilot, Skaffold), Docker, Kubernetes, Linux, CI/CD, Git

Databases & Data Engineering: MongoDB, PostgreSQL, MySQL, Snowflake, Apache Iceberg, S3, Athena

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