Derek Hua

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Education

University of California, Los Angeles (UCLA) **Los Angeles, CA**

Bachelor of Science, Computer Engineering | **GPA:** 3.74/4.0 | **Honors:** Dean's List, Fast Track to Success June 2024

Relevant Courses: Neural Networks & Deep Learning, Algorithms & Complexity, Fundamentals of Artificial Intelligence

Publications

- "Capricorn: Towards Real-time Rich Scene Analysis Using RF-Vision Sensor Fusion", SenSys 2022

Work Experience

Lockheed Martin **Sunnyvale, CA**

Artificial Intelligence Engineer Intern | *Python, Computer Vision, TensorFlow, Keras, Docker* June 2023 - September 2023

- Designed an unsupervised custom TensorFlow computer vision model within an agile work environment, yielding a novel foundational architecture adopted across multiple projects company-wide for detection and tracking
- Engineered custom Keras training loop utilizing transfer learning from a backbone model with a custom loss function
- Created dataset of 10,000 images along with custom Keras data loader with 6 image augmentation options

Networked & Embedded Systems Laboratory, UCLA **Los Angeles, CA**

Undergraduate Researcher | *Python, PyTorch, scikit-learn, C++, ROS* June 2021 - Present

- Conduct research on sequence-to-sequence models to reconstruct heartbeat and respiratory waveforms from UWB signals, exploring a range of techniques including TCN, RNNs, Transformers, and Variational Inference models
- Train SVM classifier with 98% accuracy to detect vibrational states of household appliances using UWB radar sensors
- Construct multimodal sensor fusion nodes in C++ and Python on Linux edge devices, using ROS for sub-50ms data transmission between nodes, resulting in a smooth 20 fps digital twin of a real-world space

Abbott Diabetes Care **Alameda, CA**

Research and Development Intern | *Python, NumPy, Matplotlib* July 2020 - September 2020

- Analyzed glucose sensor data and error codes using pandas and NumPy, revealing root causes of sensor failures
- Developed visualization tool to present sensor failure timeline using Matplotlib in Python to communicate findings

Personal Projects

SnapCook - AI Application| *TensorFlow, LLM, Python* June 2023 - Present

- Developed an application utilizing computer vision to identify ingredients and provide recipes leveraging PaLM 2
- Achieved 98% accurate vision model by implementing data augmentation and transfer learning techniques in TensorFlow

Bruinfessions - Web Application | *React, Node.js, Firebase, Git, Javascript, CSS* March 2022

- Spearheaded a team of 5 by architecting a web app enabling users to anonymously post, like, and favorite confessions
- Utilized React and Javascript to build dynamically updating front-end features: Sorting, Favoriting, Liking
- Engineered backend and Google Auth sign-in using Firebase and Node.js, allowing real-time storing and syncing of data

Micromouse - Autonomous Maze Solving Robot | *C, STM32, Soldering* October 2020 - May 2021

- Developed autonomous control system on STM32 microcontroller using IR sensors and optical encoders
- Implemented flood fill maze solving algorithm and designed a queue in C to solve for an optimal path through the maze

Technical Skills

Programming Languages: Python, C, C++, Java, JavaScript, HTML, CSS

Frameworks: PyTorch, TensorFlow, Keras, Firebase, React, Node.js, Docker, Git

Platforms: x86-64 architecture, Nvidia Jetson platform, STM32Cube platform