Derek Hua

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Education

University of California, Los Angeles — Los Angeles, CA
Bachelor of Science, Computer Engineering (GPA: 3.75 / 4.00) — *Jun. 2024*
Master of Science, Computer Science — *Jun. 2025*

Publications

- Wang, Z. et al. "Capricorn: Towards Real-Time Rich Scene Analysis Using RF-Vision Sensor Fusion." SenSys '22

Experience

Artificial Intelligence Engineer Intern — Jun. 2023 – Sep. 2023
Lockheed Martin — *Sunnyvale, CA*

- Designed an unsupervised custom TensorFlow computer vision model within an agile work environment, yielding a novel foundational architecture to generate embeddings for detection and tracking
- Researched machine learning papers, recreated models in TensorFlow, and innovated on existing architectures
- Engineered Keras training loop for transfer learning from a backbone model with a custom unsupervised loss function, resulting in rich embeddings and distinct clusters
- Generated a 10,000 image dataset and custom Keras data loader with 6 image augmentation options

Undergraduate Researcher — Jun. 2021 – Present
Networked and Embedded Systems Laboratory — *Los Angeles, CA*

MobiVital — *Sep. 2022 - Present*

- Create open-source heartbeat and respiratory signals datasets for vital monitoring with ultra-wideband radar
- Research deep learning techniques for radar signal reconstruction, including transformers, autoencoders, LSTMs
- Recreate models described in academic papers in PyTorch to fine tune and build upon existing architectures

Capricorn — *Jun. 2021 - Jun. 2022*

- Trained SVM classifier with 97% accuracy to detect internal states of appliances using UWB radar sensors
- Designed data collection strategy to capture vibrational signatures of appliances in varied positions and modes
- Integrated LiDAR and microphone arrays on Linux edge devices using C++ and Python, enabling sub-50ms data transmission via ROS for detecting humans and rendering their spatial and audio representations online at 20 fps

Research and Development Intern — Jul. 2020 – Sep. 2020
Abbott Diabetes Care — *Alameda, CA*

- 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

Projects

LLM Factuality and Fairness Evaluation | *PyTorch, Hugging Face, GCP, NLP* — Jan. 2024 – Mar. 2024

- Engineered a system to evaluate LLMs for language fairness and factuality using PyTorch and HuggingFace
- Designed zero-shot, few-shot, evidence, and chain-of-thought prompting mechanisms and evaluation metrics
- Integrated GPT-3.5 and Mixtral for evidence generation via API endpoints, improving F1-score by 27%

SnapCook | *TensorFlow, Python, LLM, PaLM2* — Jun. 2023 – Dec. 2023

- Developed an AI app that identifies ingredients and offers recipes through querying large language model APIs
- Enhanced vision model accuracy to 98% using TensorFlow for data augmentation and transfer learning

Bruinfessions | *React, Node.js, Firebase, Git, Javascript, CSS* — Mar. 2022

- Designed an anonymous forum, facilitating user engagement through posting, liking, and favoriting features
- Implemented real-time, dynamic content sorting and interaction capabilities leveraging React and JavaScript
- Engineered backend and Google Auth using Firebase and Node.js for data storage, retrieval, and synchronization

Technical Skills

Languages: Python, C/C++, Java, JavaScript, HTML/CSS, MATLAB
Frameworks: React, Node.js, Firebase, Docker, Git
Libraries: PyTorch, TensorFlow, Keras, scikit-learn, Hugging Face, NumPy, pandas, OpenCV, Matplotlib