

# Jong Hoon Park

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## EDUCATION

### Carnegie Mellon University (CMU)

Pittsburgh, PA

Master of Science in Mechanical Engineering – Research | GPA: 3.89/4.0

May 2024

Coursework: Big Data Science, Visual Learning & Recognition, Deep Learning, On-Device Machine Learning

### University of California, Davis

Davis, CA

Bachelor of Science, Aerospace Engineering and Mechanical Engineering

Dec 2019

## SKILLS

**Languages & Frameworks:** Python, C++, CUDA, Git, Linux, AWS, GCP

**AI Tools:** PyTorch, Scikit-learn, OpenCV, LangChain, Hugging Face

## WORK EXPERIENCE

### Graduate Research Assistant, Carnegie Mellon University | Pittsburgh, PA

May 2023 – Present

#### VTOL Pilot Mental Workload Estimation via Multimodal Machine Learning

- Worked on an industry-funded project for estimating pilot mental workload via multimodal machine learning.
- Worked with eye tracking devices and applied computer vision methods to extract semantic data from eye gaze.
- Achieved 63% accuracy in predicting pilot workload through developing machine learning models.
- Employed parallel computing with an end-to-end cloud platform to accelerate feature processing by 30 times.
- Conducted user studies approved by IRB, collecting biometric data from 28 certified pilots.

### Engineering Consultant, Celerity Consulting Group | Walnut Creek, CA

Feb 2020 – May 2022

#### Transmission Line Upgrade Analysis & Mapping Support

- Piloted a new project assessing integrity of electric transmission lines and recommended repairs to clients.
- Mentored new hires by providing feedback and identifying areas for improvement.

## ACADEMIC PROJECTS

### LLM-powered Q&A System with Reduced Hallucination | PyTorch, LLMs

Jan 2024 – Present

- Constructed an LLM-powered Q&A system utilizing LangChain.
- Employed Retrieval-Augmented Generation (RAG) to retrieve answers from documents to address hallucination.
- Developed a webapp using Streamlit to facilitate document uploads and Q&A interactions related to documents.

### Cockpit View Semantic Segmentation | PyTorch, ML, Computer Vision

Nov 2023 – Dec 2023

- Fine-tuned a pretrained Mask R-CNN to extend its domain for segmenting real-world cockpit views.
- Created a custom dataset of cockpit view images from four types of airplanes using a flight simulator.
- Enhanced model generalization by augmenting images with custom weather and lighting variations.

### Generative AI Model Compression on Device | PyTorch, ML, Model Compression

Sept 2023 – Dec 2023

- Deployed and compressed a 73 million-parameter image generation model into an NVIDIA Jetson Nano.
- Implemented knowledge distillation, reducing model size by 58% with minimal performance drop.
- Enhanced inference speed on device by 94% on GPU via post-training static quantization to float16 domain.
- Developed a filter-wise structured pruning method and identified sensitive convolution kernels within encoders.

### Vehicle Image Classification | PyTorch, ML, Computer Vision

Apr 2023

- Attained 2nd position in an academic course's Kaggle competition for classifying vehicle categories from images.
- Implemented end-to-end vehicle image cropping and feature extraction techniques.
- Achieved 69% classification accuracy by fine-tuning a pre-trained ResNet18 with 7,500 driving scene images.

### Human Facial Emotion Recognition | PyTorch, ML, Computer Vision

Oct 2022 – Dec 2022

- Built and trained a convolution neural network (CNN) for emotion prediction using 291,000 face images, achieving 70% prediction accuracy.
- Implemented and demonstrated real-time inference for human face detection and emotion recognition.

## LEADERSHIP

### LLM (Large Language Model) Project Team Lead, Course 24-782, CMU, Pittsburgh, PA

Jan 2024 - Present

### Team Lead, Celerity Consulting Group, Walnut Creek, CA

Aug 2020

### Advanced Modeling Aeronautics Team Section Lead, UC Davis, CA

Feb 2018 – June 2018

### Artillery Gun Section Squad Leader, Republic of Korea Army, Paju, South Korea

Sep 2016 – Jul 2017