# 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.
- Conducted user studies, collecting physiological (e.g., heart rate, skin conductance) and self-reported measures from 28 certified pilots.
- Utilized eye tracking devices and applied computer vision methods to extract semantic data from eye gaze.
- Employed parallel computing with an end-to-end cloud platform to accelerate feature processing by 30 times.

**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 Chatbot with Reduced Hallucination** | *PyTorch, LLMs*                       Jan 2024 – Present
- Constructed an LLM-powered Q&A chatbot 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
- Fine-tuned a pre-trained ResNet model with 7,500 driving scene images.
- Implemented end-to-end learning with vehicle image cropping and feature extraction techniques.

**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