

# Kaustav Mukherjee

415-216-5804 | [kaustav.mukherjee2020@gmail.com](mailto:kaustav.mukherjee2020@gmail.com) | [linkedin.com/in/kaustavmu](https://www.linkedin.com/in/kaustavmu) | [github.com/kaustavmu](https://github.com/kaustavmu)

## EDUCATION

<b>Carnegie Mellon University (CMU)</b> <i>Masters of Science in Computer Vision</i>	Pittsburgh, USA Aug 2024 – Dec 2025
<b>National University of Singapore (NUS)</b> <i>BEng in Mechanical Engineering, 2nd Major in Innovation and Design (First Class Honours)</i>	Singapore Aug 2020 – May 2024

## WORK EXPERIENCE

<b>Kaliber Labs</b> <i>AI Engineer</i>	San Francisco, USA Jan 2024 – Jul 2024
<ul style="list-style-type: none"><li>Fine-tuned Llama-3-8B on surgical data, achieving 84% of GPT-4o's performance for 2% of the operational cost</li><li>Accelerated convergence of camera pose estimation algorithm by 10 times with particle swarm optimization (PSO)</li><li>Developed intra-operative camera registration algorithm taking under 10 seconds utilizing neural radiance fields</li><li>Implemented methods for digital linear and geodesic measurements between points with above 90% accuracy</li></ul>	
<b>Software Engineering Intern</b>	Jan 2023 – Dec 2023
<ul style="list-style-type: none"><li>Spearheaded development and prompt engineering for a new multi-modal patient chat-bot - combining surgical image model outputs, RAG with patient data, and LLMs - with Flask, NextJS, AWS, and Langchain</li><li>Fine-tuned stable diffusion to generate synthetic training data, expanding surgical tool datasets by up to 5 times</li><li>Employed synthetic data generation and augmentation to train multiple image classifiers to above 97% accuracy</li><li>Trained pix2pix for modality conversion and added interpolation pipeline to multiply MRI dataset size by 10 times</li></ul>	
<b>F-Drones</b> <i>Systems Engineering Intern</i>	Singapore May 2022 – Oct 2022
<ul style="list-style-type: none"><li>Programmed Lua scripts and modified Ardupilot code for additional safety and control features</li><li>Led team of 3 to overhaul drone communication system, increasing drone delivery consistency to over 95%</li><li>Set up simulation-in-the-loop with Ardupilot, enabling diagnosis of a critical bug in under 4 hours after a crash</li></ul>	
<b>Scifie Robotics</b> <i>Robotics Engineering Intern</i>	Singapore Mar 2021 – Aug 2021
<ul style="list-style-type: none"><li>Tested use of Nvidia Jetson Nano for computer-vision-based navigation with Tensorflow and PyTorch</li><li>Prototyped and designed a 10 kPSI nozzle and magnetic mounting bracket for under 50% the cost of stock parts</li></ul>	

## LEADERSHIP

<b>Chief Engineer</b>   <i>Team AeroNUS</i>	Jul 2021 – Apr 2022
<ul style="list-style-type: none"><li>Led team of 10 to create an aeroplane for the AIAA DBF 2022 competition, achieving NUS's highest report score</li><li>Created a Multi-Disciplinary Design Optimization (MDO) program on MATLAB to determine plane sizing, calculating flight characteristics for over 100000 planes with 4 independent variables and over 20 outputs</li><li>Established training program for future team, improved next year's overall ranking by 15 spots</li></ul>	

## PROJECTS

<b>Neural Plane Optimization</b>   <i>Python, Keras, Matlab, Non-Differentiable Optimization</i>	Apr 2024 – May 2024
<ul style="list-style-type: none"><li>Utilized a neural network and PSO to speed up a pre-existing aeroplane optimization program over 100 times</li><li>Increased design space by over 1000 times by training a DNN with Keras for 2D to 3D aerodynamic estimation</li></ul>	
<b>Vidi</b>   <i>Python, YOLOv8, Prompt Engineering, Multiprocessing</i>	Jun 2023
<ul style="list-style-type: none"><li>Designed glasses in a team of 2 to aid blind individuals with a Raspberry Pi, speaker, microphone, and camera</li><li>Wrote software to simultaneously process sensor inputs and outputs using YOLOv8, GPT-4, and multiprocessing</li></ul>	
<b>PPE Detection with Invigilo AI</b>   <i>Python, PyTorch, YOLOv5, OpenCV</i>	Aug 2021 – Nov 2021
<ul style="list-style-type: none"><li>Fine-tuned YOLOv5 for helmet, vest, ladder, and platform detection in construction sites for startup Invigilo AI, improving performance over raw images by 58% through OpenCV image grey scaling and histogram equalization</li></ul>	

## SKILLS

**Machine Learning and Computer Vision:** PyTorch, Tensorflow, Keras, NumPy, OpenCV, Prompt Engineering, LLM Fine-tuning, Image Generation and Classification, Non-Differentiable Optimization  
**Software Engineering:** Python, JavaScript, C++, React, Flask, NextJS, AWS, Linux, Git