Thomas Patton

tjpatton1@gmail.com | linkedin.com/in/thomaspttn | thomaspttn.github.io

Education

Cornell University • Ithaca, NY — August 2022 – May 2023
Master of Engineering, Computer Science

Case Western Reserve University • Cleveland, OH — August 2017 – May 2021
Bachelor of Science, Computer Science

Work Experience

Senior Software Engineer – ModalAI Inc — Jun 2023 – Present
San Diego, CA

- Created a hardware-optimized computer vision library in C/C++ designed to run on lightweight drones. This library offloads core computer vision logic to signal processors, resulting in a significant reduction in CPU utilization, power consumption, and heat generation.
- Used aforementioned library to create a custom visual feature tracker in C++ to assist in Visual-Inertial Odometry. As a result of hardware optimizations, tracker is significantly more efficient enabling performant real-time tracking on-device.
- Assumed ownership and maintenance responsibilities for key packages within the company's SDK focused on computer vision including our machine learning models, depth from stereo server, and thermal optic flow.

Machine Learning Engineer – Cohere Health — Mar 2021 – Aug 2022
Boston, MA

- Designed a scalable and transparent Optical Character Recognition pipeline to process uploaded clinical documents using Tesseract, AWS, Docker and Kafka. Pipeline operates 85% faster than its predecessor leading to a two million dollar operational savings in only six months of runtime.
- Developed Natural Language Processing pipelines using SpaCy to extract clinical evidence from a patient's documents. These pipelines allow patients to be automatically approved for insurance creating massive savings while reducing burden on nurses.
- Independently trained and deployed a Convolutional Neural Network in TensorFlow to recognize submitted document templates. This application allows for the automatic sorting of faxes and attachments giving large savings in processing time and cost.
- Worked in an agile-based team using Git, AWS, and Docker.

Software Engineering Intern – NASA Glenn Research Center — Jun 2019 – Aug 2019
Cleveland, OH

- Created an algorithm using C/C++ and OpenGL which takes spaceflight parameters for the International Space Station and generates a visualization indicating the spacecraft's orientation in flight. This provides insight to how self-shadowing occurs on the solar panels during orbit - an invaluable resource to the power analysis team at NASA to assist with solar panel and battery development.

Research Experience

Computer Vision Researcher – EmPRISE Lab — Nov 2022 – Jun 2023
Ithaca, NY

- Created and trained a MaskRCNN Segmentation model in PyTorch to recognize food items on a plate for downstream robot-assisted feeding. Improved model tripled the number of "recognizable" food items while also improving mean-average precision and recall.
- Developed a semi-autonomous labeling algorithm in Python which uses 3D reconstruction from depth data to label segmentation videos. This algorithm avoided >$30,000 in manual labeling costs and helped create a food item dataset available for public use.

Student Researcher – Center for Computer Imaging and Personalized Diagnostics — Jan 2020 – Mar 2021
Cleveland, OH

- Implemented a post-processing algorithm which takes CT scans whose lung boundaries have been corrupted by COVID-19 and automatically corrects them. This algorithm is part of a fully-functional pipeline using Python and OpenCV which automates the lung segmentation imaging process for radiologists.
- Implemented machine learning feature analysis on quantitative lung morphology features to predict lung cancer patient's response to immunotherapy (see publication).

Publications

Mehdi Alilou, **Thomas Patton**, Pradnya Patil, Nathan Pennell, Kaustav Bera, Amit Gupta, Pingfu Fu, Vamsidhar Velcheti, Anant Madabhushi. *"Quantitative Lung Airway Morphology (QuaLM) features on chest CT scans are associated with response and overall survival in lung cancer patients treated with checkpoint inhibitors"*. Journal for Immunotherapy of Cancer 2021. November 2021.