Thomas Klein

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science - Mechanical Engineering (Robotics and AI Concentration) — *May 2024*

- GPA: 4.00/4.00
- Relevant Coursework: Computer Vision, Geometry Based Methods for Vision, Machine Learning/Artificial Intelligence, Visual Learning & Recognition, SLAM, Modern Control Theory, Advanced Control Systems .

State University of New York at Buffalo — Buffalo, NY
Bachelors of Science - Mechanical Engineering — *May 2022*

- GPA: 3.965/4.00

SUNY Jamestown Community College — Jamestown, NY
Individual Studies — *May 2020*

- GPA: 3.96/4.00

PROJECTS

Redesign of Manufacturing Process for Product of Tapecon Inc. — Fall 2021

- Analyzed the current process used in production by in-house inspection, time studies, and the cost analysis of each step in the process.
- Identified three areas of interest for improvement and researched possible solutions to reduce overall time and cost.
- Performed an ROI of each solution and its impact on both the reduction in cost as well as time.
- Created a timeline for testing and implementation of most impactful solutions

Vehicle Control Project, Modern Control Theory — Fall 2022

- Linearized state space equations and developed a PID controller for the system
- Checked the controllability and stabilizability of the system and designed a full-state feedback controller using pole placement.
- Designed an LQR optimal controller for lateral and longitudinal control.
- Designed and implemented an EKF for SLAM for estimating the position and heading of the vehicle.

Learning Human-Like Tonal Inflections for Humanoid Robotics — Fall 2022

- Created dataset attempting to mimic tonal inflections in Mandarin using robot.
- Generated tones by manipulating the silicon "throat" of the mouth robot through the use of servo motors.
- Trained tonal classifier on human speech dataset and tested on the generated data.
- Performed audio analysis through generation of mel frequency ceptral coefficients (MFCCs) to compare audio waves between humans and the robot.

Automatic Speech Recognition with Synthetic Speech — Spring 2023

- Generated synthetic speech using speech synthesizer on LibriSpeech dataset.
- Trained automatic speech recognizer on the synthetically generated speech and tested on human audio samples.
- Tested the current state of speech synthesis and its ability to replicate the intricacies of human speech.

WORK EXPERIENCE

AiPEX Lab — Pittsburgh, PA
Research Assistant — *May 2023 - Aug 2023*

- Assisted in curating and organizing newly collected dataset for physiological measurements using computer vision.
- Led research efforts in deep learning methods for blood pressure estimation.

SUNY at Buffalo — Buffalo, NY
Teaching Assistant - Applied Mathematics Course — *Aug 2021 - Dec 2021*

- Assisted students by answering questions regarding material covered or assignments.
- Responsible for grading both assignments and exams within deadlines.

Skills

Programming Languages: MATLAB, Python, C++
Application Software: Solidworks
Tools/Libraries: PyTorch, OpenGL, MS Office, LaTeX, GitHub