

EDUCATION

University of Illinois Urbana-Champaign Expected May 2025
Master of Science in Electrical and Computer Engineering

University of Kansas May 2023
Bachelor of Science in Computer Science and Bachelor of Arts in Mathematics with Honors
Thesis: "Model Predictive Control for Self-Driving Cars"

SKILLS

Languages: Python, C, C++, JavaScript, MATLAB

Technologies: Git, Linux, Robot Operating System (ROS), SolidWorks, CasADi, Simulink

WORK EXPERIENCE

Autonomous and Unmanned Vehicle Systems Laboratory, Research Assistant Jan 2024 – Present

- Developed physics-based simulation for differential drive vehicle and ran experiments to verify accuracy
- Designed reinforcement learning environment to optimize the mapping between a robot operator's input and the control output, enabling improved performance while maintaining human-level decision-making

UIUC ECE Department, Teaching Assistant Aug 2023 – Dec 2023

- Appeared on List of Teachers Ranked as Excellent by their Students

Southwest Research Institute, Robotics Software Group Intern May 2023 – Aug 2023

- Collaborated with science museum's owner to create portrait-drawing exhibit by implementing a perception and motion planning pipeline on an industrial robot
- Wrote Python library for transforming images into drawable representations using OpenCV
- Used SolidWorks to design and 3D print a compliant end effector for holding drawing utensils

Technische Universität Graz, Undergraduate Research Assistant June 2022 – July 2022

- Implemented a physical testing platform for autonomous vehicle perception and planning algorithms
- Used client-server architecture with Python and C++ for remote control and monitoring of scale car

SS&C Technologies, Applied Analytics Group Intern June 2021 – Aug 2021

- Transitioned core product to cloud and decreased runtime 81% with custom PostgreSQL configuration
- Improved team's ability to visualize and query new datasets by building data-exploration web app

KU Solar Car Team, Telemetry Team Lead Sept 2019 – May 2022

- Led subsystem team for collecting, storing, and visualizing operational data produced by a solar car

PROJECTS

Model Predictive Control for Racing (Course Capstone) github.com/AlexGisi/mpc-racing

- Implementing model predictive controller which reduced lap time by 20% in simulation by maximizing car's progress while respecting lanes and maintaining control, using the CasADi library and Ipopt solver
- Used nonlinear optimization to identify dynamic bicycle model parameters

Self-Driving Golf Cart Prototype (CS Capstone) github.com/AlexGisi/CADD-E

- Designed localization, planning, and control modules with ROS interfaces for an autonomous golf cart
- Implemented model predictive controller to smoothly track paths, using CVXPY library and OSQP solver
- Voted Niehaus Award winner by peers for outstanding workmanship, innovation (out of 25 teams)

PUBLICATIONS

- M. Juston, **A. Gisi**, W. Norris, D. Nottage, A. Soylemezoglu, 'APECS: Adaptive Personalized Control System Architecture'. Preprint, doi.org/10.36227/techrxiv.172254391.18494239/v1, 2024.
- **A. Gisi**, E. Higgins, N. Kellerman, R. Pope, and D. Prebyl, 'A Review of Telemetric Subsystems Tracking Relevant Data in a Solar Powered Car'. International Telemetering Conference Proceedings, 2021.