Alexander G.E. Krolicki

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Professional Summary

A life-long learner with a passion for engineering and academia. A dedication to discipline and rigorous practice has helped develop an attitude for success within an engineering team and organization. Past projects span a variety of topics including the testing and development of a 3.5MW diesel generator engine, automating rocket launch vehicle geometry trade space exploration, as well as the modeling, programming, and testing of autonomous drones and ground vehicles. It is a belief of mine that anything is possible with the proper planning and execution. I always look to learning from others' experiences and communicate my own to best determine the solutions to complex engineering problems.

Skills

- Siemens NX, Fusion 360, Solidworks, ANSYS
- Oral Presentations, Technical Proposal Writing
- Rust, Python, Linux, Robotics Operating System
- Machine Learning, Network Comms, Control Systems

Work History

Research Scientist, 2/2023 – Present **(3 years)**
AIMdyn Inc. – *Santa Barbara*, CA

- Developed new algorithms for the modeling and control of network systems using Koopman operator theory.
- Co-PI of the Mission Integrated Network Control DARPA project subcontracted with BAE systems.
- Prime Co-PI for Intelligent Networking via Koopman-based Semantic Communications DARPA.

Systems Engineering Intern, **5/2022 – 8/2022 (0.25 year)**
Astra Space – *Alameda, CA*

- Developed in house automated aero-thermal optimization tool to study rocket launch vehicle geometry trade spaces
- Created software tools to expedite the development of high-level requirements for rocket launch vehicle designs

Graduate Research Assistant: Research Lead, **1/2021 – 1/2023(2 years)**
Distributed Intelligence and Robot Autonomy Lab – *Clemson, SC*

- Lead the construction, testing and development of an autonomous quadruped robot
- Researcher at the virtual prototyping of ground vehicles (VIPR-GS) center in the real-time controls group
- Developing new Koopman operator-based controls theory with major theoretical contributions in optimal control

Undergraduate Research Assistant: Research Lead, **12/2018 – 12/2020 (2 years)**
Clemson Autonomous Systems Team – *Clemson*, SC

- Lead 2 independent projects to develop prototype autonomous air and ground vehicles
- Developed and field-tested mapping, localization, path planning and multiagent algorithms
- Experience working with Robotics Operating System (ROS) and performing HITL/SITL testing

Development Test Engineer COOP, **05/2018 - 08/2019 (1 year)**
MTU Rolls Royce Power Systems AG – *Graniteville*, SC

- Engine test stand data analysis and drawing conclusions from tests for further improvement
- Support a multi-disciplinary international team, communicate, and coordinate tests globally

Education

Clemson University — *Clemson*, SC
Master of Science in Mechanical Engineering, — *2020 - 2022*
Concentration: Dynamical Systems and Controls
Bachelor of Science in Mechanical Engineering, — *2017 - 2020*
Minor in Mathematical Sciences

A. Krolicki, D.Rufino, and D. Tellez "Finite Time Nonlinear Optimal Control using Koopman Eigenfunctions"
IEEE American Control Conference (ACC), San Diego, CA, June 3rd, 2023
A. Krolicki, D. Tellez, and U. Vaidya "Nonlinear Dual-Mode Model Predictive Control using Koopman Eigenfunctions"
IEEE Conference on Decision and Control (CDC), Cancun, Mexico, December 6th, 2022
A. Krolicki, et. al., " Modeling Quadruped Leg Dynamics on Deformable Terrains using Data-driven Koopman Operators"
IEEE Modeling Estimation and Control Conference (MECC), Jersey City, NJ, October 2nd, 2022
A. Krolicki, S. Sutivani, and U. Vaidya, "Koopman-based Policy Iteration for Robust Optimal Control"
IEEE American Control Conference (ACC), Atlanta, GA, January 6th, 2022