Andrew Zheng

(803) 370-0980 | azheng@clemson.edu | linkedin.com/in/andrewzheng11 | andrewzheng-1011.github.io

EDUCATION

Clemson University <div align="right">**Clemson, SC**</div>
Master of Science in Mechanical Engineer, Control Systems, May 2023
Cumulative GPA: 3.87/4.00

Bachelor of Science in Mechanical Engineering, Minor in Math, May 2021
Cumulative GPA: 3.86/4.00
Honors: magna cum laude

PROFESSIONAL EXPERIENCE

DIRA Lab, Research Assistant, May 2021 - Present <div align="right">**Clemson, SC**</div>
- Integrated legged planner framework, which increased the ease in integrating standard planners into quadrupeds
- Developed and integrated novel safe navigation algorithm for quadruped locomotion
- Developed model predictive controllers for quadruped locomotion
- Facilitated 2-year integration plan of state-of-the-art planning and control for legged robots
- Trajectory prediction of nonlinear dynamics through Koopman operator theory for robotic applications

Clemson University, Teacher Assistant, May 2021-Present <div align="right">**Clemson, SC**</div>
- Enhanced knowledge and critical thinking of students by highlighting key concepts covered in course

Parker TechSeal, Mechanical Engineer Intern, May 2019 – Aug 2019 <div align="right">**Spartanburg, SC**</div>
- Performed nondestructive damage control by identifying defective rubber seal product, saving $5000+ in product sales
- Designed and validated manufacturing process to create batches military gaskets of up to $50,000 for Staver Hydraulics
- Conducted ASTM D142 Tensile Test to ensure product meet customer quality
- Programmed data searching algorithm to analyze runtime/downtime of company's vulcanizers
- Identify strengths and weakness of newly mechanical splicing to company's traditional splicing process

PROJECTS

Quadruped Robot Challenge
- Top 6 in Quadruped Robot Challenge hosted in IEEE Robotics and Automation Society (ICRA) 2023
- Designed algorithm for legged robot to traverse through a disaster environment

Tail Landing Controller
- Designed a multi-linked tail controller algorithm to aid locomotion underactuated quadruped on contact-critical terrain

Deep Koopman Autoencoder
- Created custom autoencoder model to learn physics informed linear operator with neural networks

Undergraduate Research
- Integrate sensor fusion algorithm for navigation of mobile vehicle
- Developed safety stop mechanism on a microcontroller integrated with DIRA Lab's quadruped

SKILLS

Software: ROS1, Gazebo, Linux, Git, CoppeliaSim, CasADi, Oracle VM Virtualbox, Tensorflow, Anaconda, Simulink, Solidworks
Programming Language: Python, Matlab, C++, LaTeX, PLC, VBA Excel

RELEVANT COURSEWORK

Mechanical Design: Fundamentals of Machine Design
Thermodynamics: Foundation of Thermal and Fluid Systems, Heat Transfer

Dynamic Controls: Modern Control, Modeling & Analysis of Dynamic Systems, Classical Controls, Vibrations, Advanced Controls, Applied Optimal Control
Fluid Flow: Fluid Mechanics, Compressible Flow
Mathematics: Linear Algebra, Numerical Methods, Statistical Analysis, Complex Variables
Computer Science: Applied Deep Learning

AWARDS & SCHOLARSHIPS

- President's List (4.0 GPA)
- Dean's List (3.50+ GPA)
- Clemson Scholars
- Lancaster Endowed Memorial Scholarship
- SC Palmetto Fellows Enhancement
- SC Palmetto Fellows Scholarship

PUBLICATIONS

- **Andrew Zheng**, et. al. "Safe Navigation Density: Analytical Construction". Submitted to *IEEE Robotics and Automation Letters (RA-L)*.
- Joseph Moyalan, **Andrew Zheng**, et. al. "Off-Road Navigation of Legged Robots using Linear Transfer Operators". Submitted to *Model, Estimation, and Control Conference (MECC)*.
- Sarang Sutavani, **Andrew Zheng**, et. al. "Artificial Neural Network Based Terrain Reconstruction for Off-Road Autonomous Vehicles Using LiDAR". Submitted to *Ground Vehicle Systems Engineering and Technology Symposium (GVSET)*.
- Alex Krolicki, Dakota Rufino, **Andrew Zheng**, et al. "Modeling Quadruped Leg Dynamics on Deformable Terrains using Data-driven Koopman Operators". *Modeling Estimation and Control Conference (MECC)*, September 2022, Conference Presentation