MARLA R. EISMAN

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EDUCATION

University of Florida, Wertheim College of Engineering Gainesville, FL
Bachelor of Science in Mechanical Engineering December 2024
Upper Division GPA: 3.7/4.0

PUBLICATIONS

C. F. Nino, **M. R. Eisman**, J. W. Cross, O. S. Patil, W. E. Dixon, "Multi-agent Target Tracking using Deep Residual Neural Networks" In preparation for submission to *IEEE 64th Conference on Decision and Control*.

M. R. Eisman, "Development and Experimentation of Residual Neural Network Architectures" Honors thesis defended Dec 2024, in preparation for submission to *IEEE 64th Conference on Decision and Control*.

RESEARCH EXPERIENCE

Nonlinear Controls and Robotics Laboratory (PI: Dr. Warren Dixon) Gainesville, FL
Undergraduate Researcher January 2023 – Present

- Applied nonlinear control theory and intelligence algorithms to design adaptive and robust dynamic models for multi-agent herding, tracking, and swarm dynamics with outdoor real-time learning experimentation
- Developed novel deep residual neural network architecture and Lyapunov stable controller and proved the precise correspondence between the simulation and theoretical predictions
- Created a recursive Python framework to analyze and simulate adaptive control and deep learning of multi-agent systems with seamless parameter modulation, including neural depth, learning rate, and activation functions, which produced error comparisons, function convergence graphs, and real-time dynamics visualizations
- Designed and built custom IP55-rated quadcopters and a ROS 2 framework for receiving GPS, IMU, Lidar, and other sensor data over a 5G Starlink network
- Demonstrated drone control strategies for multi-agent swarm, herding, and communication interruption dynamics to the US Air Force

Gator Motorsports Gainesville, FL
Lead Engineer, Vice President Oct 2023 – Aug 2023

- Led the research and development of UF's first electric vehicle (EV) for the Formula SAE racing competition
- Earned over $70,000 in funding through grant proposals and leadership of 30 members to contact over 250 potential sponsors
- Engineered a comprehensive MATLAB lap dynamics model to simulate and analyze incremental race conditions with high-order dynamics including regenerative braking
- Designed a custom 400-volt lithium-ion powertrain and robust cooling system to efficiently power the vehicle and maintain safe battery temperatures
- Represented the team on WUFT News (PBS) and the Engineering MAEvericks podcast discussing EVs and their role in reducing the global carbon footprint

Cognition, Action, and Perception of Speech Laboratory (PI: Dr. Matthew Massapollo) Gainesville, FL
Undergraduate Researcher Aug 2021 – Jan 2022

- Developed a MATLAB-based data repository with integrated 3D visualization to analyze articulatory and oral movements
- Developed a mechanical packaging solution for sensors attached to the human tongue optimizing safety and minimizing sensor interference
- Calibrated and operated an electromagnetic articulography system during studies to collect and evaluate millisecond-by-millisecond data

PROFESSIONAL EXPERIENCE

SpaceX Cape Canaveral, FL
Final Integration Engineering Intern May – Aug 2023

- Invented durable seat protection hardware for the Dragon capsule through finite element analysis, material testing, and convergence to critical Remove Before Flight (RBF) constraints, saving $7,900 per mission
- Formulated new hazardous propellant handling standards through advanced data analysis and automated valve leak detection, reducing engineering labor hours by 50%
- Invented tooling improvements for adhesive applications, reducing technician labor by 60 hours per campaign

Tesla Fremont, CA
Thermal Management Engineering Intern May – Aug 2022

- Designed novel hardware-in-loop Python program to automate and parallelize continuous critical data logging and fault detection for fixtures cycling 1000+ hours from -50 to +60 ℃
- Designed, fabricated, and operated seven specialized electromechanical test fixtures based on extrapolated vehicle failure reports, reducing testing timeline by nine months
- Maintained global partnerships with suppliers to implement targeted reliability improvements based on failure analysis

TEACHING EXPERIENCE

University of Florida Society of Women Engineers Gainesville, FL
Volunteer & Member May 2020 – Present

- Volunteered at 2+ events per semester to educate public elementary and middle school low-income students on STEM concepts
- Designed and taught comprehendible and entertaining lessons on vibrations, the water cycle, engineering design, etc.

University of Florida Mechanical & Aerospace Engineering Department Gainesville, FL
Teaching Assistant Jan – May 2024

- Served as a teaching assistant for introductory engineering design, manufacturing, and analysis course taught by Dr. Daniel Dickrell
- Conducted reviews, held 10 office hours per week, and graded assignments and exams for 84 students

AWARDS

- **Blue Origin Design Grant** - Awarded $1000 funding for Gator Motorsports team based on my proposal for design innovation and diversity/inclusion efforts
- **Formula SAE Michigan 2022 – 3rd Overall, 1st Acceleration, 3rd Design, 3rd Autocross** -
- **Southside Businessmen's Club Youth Achiever Scholar** -
- **Florida Bright Futures Academic Scholar** -