Marla Eisman - Curriculum Vitae

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EDUCATION

Bachelor of Science in Mechanical Engineering December 2024
University of Florida, Wertheim College of Engineering Gainesville, FL
Upper Division GPA: 3.85/4.0

PUBLICATIONS

M. R. Eisman, "Enhanced Target Tracking Using Real-Time Residual Neural Networks" Honors thesis defended Nov 2024, in preparation for submission to *IEEE Conference on Decision and Control.*

C. F. Nino, **M. R. Eisman**, J. W. Cross, O. S. Patil, W. E. Dixon, "Multi-Agent Herding with RISE Control and Real-Time Residual Learning" In preparation for submission to *IEEE 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 machine learning 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 to the US Air Force for multi-agent stability in communication interruptions

Gator Motorsports (Advisor: Dr. Sean Niemi) Gainesville, FL
Lead Engineer, Vice President August 2020 – April 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 by writing grant proposals and leading 30 members to contact 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 battery powertrain and robust liquid and air cooling system to efficiently power the vehicle and maintain safe battery temperatures

- Presented research 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 Masapollo) Gainesville, FL
Undergraduate Researcher August 2021 – January 2022

- Developed a Matlab-based data repository and visualization system with integrated 3D oral modeling to analyze articulatory and linguistic movements

- Developed a biomechanical soft robotic packaging solution for sensors attached to the human tongue, optimizing safety and minimizing sensor interference

- Calibrated and operated an electromagnetic articulograph during studies to collect and evaluate millisecond-by-millisecond data for cognitive and speech-based patterns

PROFESSIONAL EXPERIENCE

Space Exploration Technologies Corp. (SpaceX) — Cape Canaveral, FL
Final Integration Engineering Intern — May – August 2023

- Invented durable seat protection hardware for the Dragon capsule through finite element analysis, material testing, and convergence to critical Remove Before Flight constraints, saving $7,900 per mission

- Formulated new hazardous propellant handling standards through advanced data analysis and automated valve leak detection, reducing engineering labor by 35 tickets per mission

- Invented tooling improvements for adhesive applications, reducing technician labor by 60 hours per campaign

Tesla, Inc. — Fremont, CA
Thermal Management Engineering Intern — May – August 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 robust electromechanical test fixtures based on extrapolated vehicle failure reports, reducing testing timeline by nine months

- Maintained global partnerships and communication with suppliers to implement targeted reliability improvements based on failure analyses

TEACHING/VOLUNTEER EXPERIENCE

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

- Educated local public elementary and middle school students at 2+ events per semester to promote STEM exposure to diverse communities

- Designed and taught accessible and interactive lessons on vibrations, the water cycle, and engineering design

- Volunteered with external events, including Alachua Habitat for Humanity to construct affordable, safe homes for community members

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

- Taught engineering design, manufacturing, and analysis course as a teaching assistant for Dr. Daniel Dickrell

- Conducted reviews, held 10 office hours per week, and graded assignments and exams for 84 students

Haven Hospice — Gainesville, FL
No One Dies Alone Volunteer — September 2023 – Present

- Provided 30 hours of care through local nonprofit for end-of-life and nursing home residents, in the No One Dies Alone program

- Played guitar and sang for individuals and groups as music therapy, read books out loud, and spent quality time with patients and families

AWARDS

- **Blue Origin Design Grant 2023** - Awarded 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 among 100 worldwide teams for the design, build, and manufacturing of Formula-style race car

- **Southside Businessmen's Club Youth Achiever Scholar 2020-2024** - Awarded $20,000 in recognition of my community outreach and academic achievement

- **Florida Bright Futures Academic Scholar 2020-2024** - Awarded 100% university tuition coverage in recognition of my outstanding academic performance and volunteer work