Projected Graduation: May 2021

US Citizen

Education

Robotics and Autonomous Systems (Mechanical Engineering) M.S. | Arizona State University

GPA: 4.00/4.00

Mechanical Engineering B.S.E. | Arizona State University, Barrett the Honors College

GPA: 3.74/4.00

Skills

Programming

MATLAB

🛕 Linux

Git Python

ROS

VRML

Arduino

LabVIEW

👙 Java

CAD & FEA

SolidWorks

Solid Edge

ANSYS

Fusion 360

Tinkercad

Simulation

Simulink

Webots

Optimization

Y YALMIP

Motion Capture

Motive

Drone Control

QGroundControl

Laser Cutting

UCP

3D Printing

Ultimaker Cura

LulzBot Cura

Ideamaker

Zortrax Z-Suite

MakerBot Print

Formlabs Preform

Basic Computing

Microsoft Office

Google Drive

Adobe CC

Experience

Graduate Researcher | Optimal Control for Lunar Tumbling Robot

Arizona State University | Intelligent Control and Estimation of Things (ICE-T) Lab | NASA

Aug 2020 - Current

Graduation: May 2020

Investigating optimal control techniques for hybrid systems using the YALMIP MATLAB toolbox. Findings will be applied to NASA's lunar tumbling robot in the Webots robotic simulator.

Optimal Control | Hybrid Systems | Model Predictive Control | Simulation

Summer Intern | Numerical Simulator for Lunar Tumbling Robot

NASA | Goddard Space Flight Center

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Hired as a sole Summer intern to create a 3D simulation test bed as a platform to develop estimation and control algorithms for NASA's lunar tumbling robot. Created physically accurate robot assets and lunar environment with interchangeable components. Implemented python-based mode logic and motion control algorithms for manual and autonomous control. Optimized workflow with automated processes to rapidly adjust simulations and process data, reducing hours long hardware experiments to seconds. Created a wiki page with a user manual and tutorials for others to reuse and reproduce all work from scratch. Generated video demonstrations for project fundraising. Maintained distributed version control of source code with git.

Simulation | Mode Logic | PID | Automation | Documentation | Version Control

Makerspace Student Worker

Arizona State University | Hayden Library Makerspace

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3D Printing 3D Printer Repair Laser Cutting Media Production Consulting Trainings / Workshops

Capstone | Satellite Solution for Harmful Orbital Targets (Sat-SHOT)

Arizona State University | Howe Industries

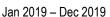
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As the CAD engineer on a capstone team of six, designed custom parts and selected electronic components for a mechanical system to freeze an ice projectile, reject heat to space, and load the projectiles into a gas gun. This satellite will fire at and deorbit existing space debris with no secondary debris.

CAD Design | Thermodynamics | Orbital Mechanics | Manufacturing | Process Control

Independent Researcher | Two-Wheel Self-Balancing Robot

Arizona State University | Independent Research Continued as Team Project



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For fun, designed an Arduino-based two-wheel self-balancing robot on a custom chassis. Later, as a team of four, developed PID, full state feedback, and LQR controllers for self-balancing that worked in simulations but did not work on the hardware due to software threading constraints.

[See GrabCAD for more information]

CAD Design | Controller Design | PID | FSF | LQR

Undergraduate Researcher | Autonomous Coupling of a UAV and UGV

Arizona State University | Human Oriented Robotics and Control (HORC) Lab



As a sole undergraduate researcher, developed a heterogeneous team of robots that navigate a space in coupled and decoupled configurations to overcome obstacles and increase range. Designed an electromagnetic coupling mechanism that allowed a UAV to lift a UGV over an obstacle and allowed the UGV to carry the UAV greater distances. Implemented python-based mode logic and motion control algorithms for

[See Video, Paper, or GrabCAD for more information]

autonomous control. This heterogeneous team of simple robots can achieve more together than they could on their own but cost less than a single robot with the same capabilities.

Multi-Robot System | Autonomous Control | Motion Capture | Rapid Prototyping



Scan the QR code or follow the <u>link</u> to see more of my projects: