

# Jedidiah Alindogan

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## EDUCATION

**Ph.D. in Control and Dynamical Systems**  
California Institute of Technology  
09/2024 - Current

**B.S. in Mechanical Engineering**  
California Institute of Technology  
09/2021 - 06/2023

**A.S. in - Physics, Math, Mechanical Engineering, and Electrical Engineering**  
American River College  
06/2018 - 06/2021

## SKILLS

### Programming Languages

- Python, C++, C#

### ML/Robotics

- Pytorch, ROS 1, ROS 2, Gazebo




### Computation

- MATLAB, Mathematica

### Design

- Solidworks, Fusion360, ANSYS

## LINKS

 [jedi-alindogan.github.io](https://github.com/jedi-alindogan)  
 [github.com/jedi-alindogan](https://github.com/jedi-alindogan)  
 [www.linkedin.com/in/495-jedidiah-alindogan](https://www.linkedin.com/in/495-jedidiah-alindogan)

## HONORS & AWARDS

2022 - Tau Beta Pi Honors Society Member

2021 - 2022 NASA BIG Idea Challenge Finalist

2019 - NASA Community College Aerospace Scholar

## RELEVANT COURSES

Manipulation, Kinematics, Dynamics; Planning, Navigation, and Perception; Robotics Lab: Localization and Perception;

Optimization;  
Linear Functional Analysis;  
Probability and Measure Theory;  
Probability Models;

Data-Driven Control;  
Nonlinear Dynamics and Control;  
Linear System Control;  
Optimal Control and Estimation;

## EXPERIENCE

### Research Engineer - Caltech

08/2023 - 08/2024

Experimentation, Simulation, Python, ROS, Gazebo; Actively contribute to the design and execution of experiments, employ advanced simulations, and engage in software development within the Autonomous Robotics and Control Lab

- *Autonomous Offroad Sensing Platform*

- C++, Python, Arduino
- Developed autonomous payload for a Traxxas Xmaxx to run planning and control algorithms. This included design of a payload container through Solidworks, wiring of the sensors and motors to the Jetson Orin, and calibration of the sensors and motors. Calibrating the motors was done through ODrive's online GUI, and visual-inertial odometry sensor calibration was accomplished via online packages such as OALiCalib and DLIO.

- *Learning Introspective Control*

- C++, Python, Gazebo, Git
- Created a tipping safety constraint, conducted experiments for control and planning algorithms, designed simulation terrains for testing in Gazebo. The tipping safety constraint used physics-based estimation of centrifugal forces when turning on slants to prevent tipping. For experimentation, I validated neural-network based controllers on the robot over different terrain.

### Undergraduate Research - Caltech

10/2021 - 08/2022

- *NASA BIG Idea Challenge*

- Solidworks, MATLAB
- Collaborated with a team of student engineers to design and prototype a cable-traversing robot for lunar exploration. I was mainly responsible for energy calculations in MATLAB and stress analysis of the torque arm through ANSYS.

- *Data-Driven Discovery of Differentially Flat Coordinates*

- Pytorch
- Developed an autoencoder neural network to learn differentially flat coordinates for a unicycle.
- Differentially flat coordinates are a lower-dimension representation of the state of a system that are difficult to find. Utilizing Pytorch, I trained an autoencoder neural network that takes trajectory data to discover differentially flat coordinates.

### Program Assistant - Los Rios Community College District

08/2019 - 05/2021

Managed and coordinated STEM tutoring programs, overseeing a team of tutors to provide academic support and mentorship to students. Developed and implemented outreach initiatives to engage students in STEM education, fostering an inclusive and supportive learning environment. Provided instructional support, assisting students in grasping complex mathematical and scientific concepts through personalized tutoring sessions.

## PAPERS

"MAGIC<sup>FM</sup>: Meta-learning Adaptation for Ground Interaction Control with Visual Foundation Models." Elena Sorina Lupu, Fengze Xie, James A. Preiss, Jedidiah Alindogan, Matthew Anderson, Soon-Jo Chung. Published in IEEE TRO.

"Model Predictive Trees: Sample-Efficient Receding Horizon Planning with Reusable Tree Search." John Lathrop, Benjamin Rivière, Jedidiah Alindogan, Soon-Jo Chung. Presented at 2024 IEEE/RSJ.

"Lunar Architecture for Tree-Traversal In-service-of Cabled Exploration (LATTICE)." Technical paper submitted to 2022 NASA BIG Idea.

## VOLUNTEERING

### Academics Chair - Graduate Student Council

2024-Present

- Coordinate activities aimed at enhancing academic and career interests of graduate students and to help foster an environment in which graduate students can learn to become leaders in their academic fields.

### Rise Tutor - Caltech Y

2022-2023

- Advise, mentor, and tutor high school students in STEM subjects.

### Social Director Team - Avery House, Caltech

2022-2023

- Volunteer in organizing, planning, and running social events for student life on campus.

### Fair Oaks Library Volunteer - Fair Oaks Public Library

2018-2021

- More than 120 hours volunteering at the Fair Oaks Public Library to help with community events and organize texts.