ERIC DAVID VETHA

Santa Cruz, CA 95060 ericdvet@gmail.com
858-291-2652 ericdvet.github.io

OBJECTIVE

I am a robotics engineer with a strong foundation in the interdisciplinary fields of electrical engineering, mechanical engineering, and computer science, combined with hands-on experience in machine learning, autonomous systems, and sustainable agriculture technology. My passion is advancing robotics applications for agriculture and sustainability through innovative and practical solutions. I am looking for opportunities to leverage and expand my expertise in applied robotics in a research-oriented role.

EDUCATION

University of California, Santa Cruz, MS. Santa Cruz, CA
Electrical and Computer Engineering 2024 - Present

- Concentration in Robotics, Control, and Cyberphysical Systems
- Member of IEEE Eta Kappa Nu (HKN)
- **Coursework:** Linear Dynamical Systems, Convex Optimization

University of California, Santa Cruz, BS. Santa Cruz, CA
Robotics Engineering 2020 - 2024

- GPA: 3.81, Cum Laude Honors
- **Coursework:** Logic Design, Data Structures and Algorithms, Embedded Systems and C Programming, Signals and Systems, Mechatronics, Microcontroller System Design, Feedback Control Systems, Sensors and Sensing Technology, Models of Robotic Manipulation

PROFESSIONAL EXPERIENCE

Graduate Student Researcher Santa Cruz, CA
University of California, Santa Cruz 2024 - Present

- Developing a low-cost in-ground soil moisture sensing system using ultrawideband radar and backscatter tags.
- Integrating a quadruped robot as a communication network for sensing system, leveraging ROS for advanced robotic control.

Undergraduate Student Researcher Santa Cruz, CA
University of California, Santa Cruz 2023 - 2024

- Developed a low-cost in-ground soil moisture sensing system using ultrawideband radar and backscatter tags for sustainable agriculture.
- Designed a sophisticated automated peak detection algorithm, streamlining data processing.
- Conducted research in a laboratory setting, contributing to advancements in agricultural technology through hands-on experimentation.

Computer Engineering Tutor Santa Cruz, CA
University of California, Santa Cruz 2022

- Tutored students on computer systems and C Programming from an embedded paradigm.
- Assisted students in completing programming assignments on a 32-bit embedded microcontroller (Microchip PIC32.)

PROJECTS

Imitation Learning in Robotic Manipulations UCSC
Grab-o-Matic 3000 Demo Github

- A robotic system for ball-catching tasks, employing imitation learning and inverse kinematics.
- Uses imitation learning to imitate expert-like ball-catching actions based on visual observations.
- Automatically uses inverse kinematics calculations to determine optimal joint velocities for the robotic arm to intercept projected ball trajectories smoothly.

Sensor Based Instrumental Gloves UCSC
Slug Symphony Demo Github

- Gloves that emulate the saxophone, guitar, drums, piano, and trumpet.
- Flex and 9-DOF sensors integrated with UNO 32 microcontroller for accurate instrument replication.
- Uses state machines to transition between instruments, ensuring user-friendly interaction seamlessly.

Autonomous Ball Shooting Robot UCSC
Slug World Cup Demo Github

- An autonomous robot capable of autonomously traversing a field an dispensing balls in a defended goal.
- Uses state machine architecture, ensuring the robot's precise navigation, goal detection, and autonomous scoring capabilities.
- Applied a Proportional-Integral-Derivative (PID) control strategy to enhance the robot's navigation precision, implementing a Proportional (P) component to minimize errors and ensure straight-line movement.

FPGA Verilog Video Game UCSC
Watch Your Step

- Developed the "Watch your Step" game on the BASYS3 board and VGA monitor, implementing player control, hole avoidance, and coin collection.

Autonomous Driving Algorithms UCSC
F1TENTH Autonomous Racing Github

- Implemented Wall Following and Follow the Gap autonomous driving algorithms within the F1TENTH Simulator.

SKILLS

Languages: MATLAB (Proficient), C (Proficient), ROS (Experienced), Python (Experienced), C++ (Moderately Experienced), BASH/Shell Scripting (Moderately Experienced), Java (Prior Experience).

Technologies: Experience with embedded C programming, simulation environments (Gazebo and Webots), creating imitation learning models and control systems.

General: Capable of working well both individually and in groups; Comfortable with technical writing.

PUBLICATIONS

Improving Low-Cost In-Ground Soil Moisture Sensing System Using Backscatter Tags for Sustainable Agriculture Santa Cruz, CA
Honors Thesis Read Thesis

HONORS

Graduate Student Researcher funding, University of California, Santa Cruz
IEEE Eta Kappa Nu (HKN)

INTERESTS

Strength sports, bodybuilding, tech trends.