

# Jeremiah Goddard

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## Summary

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Robotics graduate student with a strong foundation in electrical and computer engineering, specializing in reinforcement learning, computer vision, and simulation for robotic applications. Experienced in in-hand manipulation research and the biomechanics of the human hand. Skilled in both hardware and software, with a proven ability to solve complex engineering challenges by integrating resourcefulness with core engineering principles. Background as a Nuclear Electronics Technician in the U.S. Navy, establishing precision, safety, and effective teamwork in high-stakes environments.

## Education

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Oregon State University

**M.S. Robotics**

**B.S Electrical/Computer Engineering cum laude**

Corvallis, OR

Expected Spring 2024

Summer 2023

US Navy Nuclear Power Pipeline

**Nuclear Electronics Technician, Reactor Operator**

Charleston, SC

Fall 2018

## Papers

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**Jeremiah Goddard**, Nigel Swenson, Xiaoli Fern, Ravi Balasubramanian, Cindy Grimm (In Progress). Assessing the Effect of Object Representation on the Generalization of In-Hand Manipulation Policies to Unfamiliar Shapes.

Nigel Swenson, **Jeremiah Goddard**, Xiaoli Fern, Ravi Balasubramanian, Cindy Grimm (In Progress). Hierarchical Reinforcement Learning for In-Hand Manipulation.

Nigel Swenson, **Jeremiah Goddard**, Xiaoli Fern, Ravi Balasubramanian, Cindy Grimm (In Review). Evaluating the Effect of State and Action Selection on In-Hand Manipulation Performance for Transferability.

## Projects

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### **Motion Capture Based Assistive Device**

As a small team a simple assistive device for individuals with upper body limitations, such as those caused by degenerative nerve disorders or physical trauma. The system, built around a Kinova Gen3 robotic arm and a custom compliant attachment for the human arm, used pre-planned paths derived from motion capture data to assist with tasks such as drinking from a water bottle or using a drill.

### **Determining Fundamental Matrices using Stereoscopic Images**

A keypoint descriptor CNN was trained to generate latent space classifications of SIFTs using open source datasets. OpenCV was then used to detect SIFT locations in stereoscopic image pairs, where the SIFT locations were then classified using the CNN and the fundamental matrices were calculated.

### **Vision-Guided Targeting System for Nerf Dart**

Used 6-DOF robotic arm with a claw gripper and camera for precise targeting of a Nerf dart. Utilized kinematics and computer vision to map the arm's movements to real-world coordinates, enabling reliable and repeatable accuracy for short-distance dart firing.

### **Soil Parameters Probe**

Coordinated with a group of three to integrate various sensors into a self-sufficient soil probe for long term deployment. Developed a capacitance-based soil moisture sensor by researching moisture detection methods and selecting components for easy integration with the system.

### **Racing Drone with Custom Controller**

Designed a drone from commercially available parts to meet specified requirements for speed, battery life, and payload capacity. Researched and implemented radio frequency communication for transceivers used with a custom-built remote.

## Skills

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**Technical Proficiencies** : Reinforcement Learning, Simulation, Sim-to-Real, Version Control, Computer Vision, Data Analysis, Motion Capture, Rapid Prototyping, 3D Printing

**Libraries/Software** : Pybullet, Pytorch, OpenCV, Pandas, Stable-Baselines3, Git, ROS/ROS2, KiCad, Solidworks, Blender, PrusaSlicer

**Programming Languages** : Python, C, C++, MatLab, AVR Assembly, L<sup>A</sup>T<sub>E</sub>X

## Work Experience

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### Oregon State University

Corvallis, Or

Undergraduate Research Volunteer, Perception Arm Testbed

Winter 2023 - Spring 2023

- Analyzed electrical schematics and wiring diagrams for a robotic arm test-bed and made recommendations for final design

### US Navy

Charleston, SC

Nuclear Electronics Technician

Spring 2017 – Winter 2019

- Safely operated an active nuclear reactor as a part of a team on over a dozen occasions
- Performed maintenance on analog, digital, and protective circuits on an active nuclear reactor
- Interpreted complex technical manuals, schematics, and procedures for both mechanical and electrical systems
- Performed daily restoration and reconstruction of classified documents to ensure information integrity and accessibility.
- Delegated tasks, daily activities and collected, organized and filed paperwork/certifications for over 100+ employees.
- Gave detail oriented safety lectures to large and small groups of employees to prevent injury
- Provided weekly instruction to new employees about expectations and company guidelines
- Provided weekly welcome aboard tours to help new arrivals get accustomed to base.

## Awards and Achievements

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Inducted Into Eta Kappa Nu, IEEE International Honor Society

Deans List : Fall 2020, Winter 2021, Summer 2021

Completed Navy Nuclear Power School

Completed Navy Nuclear Electronics Technician Training