

Joshua T. Hoegerman

+1 (757) 272-4542 | jhoegerm@vt.edu | [Google Scholar](#) | [Linkedin](#) | [Website](#)

EDUCATION

Masters of Science in Mechanical Engineering

Virginia Polytechnic Institute and State University, Blacksburg, VA

May 2024 (Expected)

Bachelors of Science in Mechanical Engineering - (Major: Robotics and Mechatronics)

Virginia Polytechnic Institute and State University, Blacksburg, VA

May 2022

Technical Coursework:

Bayesian Robotics, Human-Robot Interaction, Applied Linear Control, Applied Machine Learning, Robotics and Automation, Digital Signal Processing, Nonlinear Control Theory, Advanced Mechatronics, Industrial Electronics

PUBLICATIONS

- **Joshua T Hoegerman** and Dylan P Losey. "Reward Learning with Intractable Normalizing Functions", arXiv preprint, 2023. DOI: [10.48550/arXiv.2305.09606](https://doi.org/10.48550/arXiv.2305.09606)
- Shaunak A Mehta, Yeunhee Kim, **Joshua T Hoegerman**, Michael D Bartlett and Dylan P Losey. "RISO: Combining Rigid Grippers with Soft Switchable Adhesives", arXiv preprint, 2022. DOI: [10.48550/arXiv.2210.15791](https://doi.org/10.48550/arXiv.2210.15791)

RESEARCH EXPERIENCE

Graduate Student Researcher - Collaborative Robotics Lab

Institute: Virginia Tech

Advisor: Prof. Dylan Losey

August 2022 - Present

- Lead multiple research projects focused on improving human-robot collaboration in collaborative environments
- Developed a method to improve Bayesian Inference in nominally Intractable Normalizing factors using work from modern methods from the statistics community.
- Assisted in developing a framework for assisted grasping for a soft switchable adhesive mounted on a robot's end-effector.
- Currently writing a paper on the modification of communicative elements in the Shared Autonomy applications.

Undergraduate Student Researcher- Field and Space Experimental Robotics Lab

Institute: Virginia Tech

Advisor: Prof Erik Komendera

August 2021 - May 2022

- Implemented new end effector onto Stewart Platform for independent adhesion onto Lunar Truss structure.
- Implemented microcontroller system for operating the End Effector.
- Worked in building test truss structure for internal testing
- Developed a new connected design for the lower Stewart platform structure.

Undergraduate Student Researcher - VT AutoDrive Team

Institute: Virginia Tech

Advisor: Prof. Steven Southward

August 2020 - May 2023

- Worked on and tested the Stoplight and Sign Detection method for variable light environments (C++/OpenCV).
- Participated in Year 3 Concept Design Presentation earning 3rd place.
- Aided in testing and data collection for the Autonomous Vehicle.
- Worked in calibration and controlling visual implements for the Vehicle's Perception systems (ROS 1 / C++)
- Developed Communication system for external Postgresql Database to onboard localizer.

INTERSHIP EXPERIENCE

RESEARCH AND DEVELOPMENT ENGINEERING INTERN

TE Connectivity, Hampton, VA

Supervisor: Juan Navarro / Marcus Updyke

May 2022 - August 2022

- Designed and prototyped a novel testing platform for newly developed Piezoelectric film testing

- Achieved initial success in baseline tests for the platform for Shear-Strain feedback tests.
- Worked on the development and testing of modified hardware for other testing platforms.
- Worked in assisting the team with general technical documentation and necessary modeling tasks.

MECHANICAL ENGINEERING INTERN, MASTER MACHINE AND TOOL CO May 2021 - August 2021

Company: Master Machine and Tool Co, Newport News, VA

Supervisor: David Revere

- Worked in modeling and generating a build plan for an 8-ton historical cannon mount.
- Aided in general shop tasks for customer modeling and editing of parts for final shop production.
- Worked in general shop maintenance and facilitation of floor production tasks.

SELECTED PROJECTS

DATABASE INTERFACE FOR ONBOARD VEHICLE LOCALIZATION

DECEMBER 2022 - MAY 2023

Virginia Tech - Victor Tango Autodrive Team

Advisor: Prof. Steven Southward

- Designed Postgresql database interface for online map data to discretize relevant location data given concurrent coordinate input.
- Developed feedback loop application for signal verification given perception module's understanding of local environment using ROS node interface.
- Further developed interface to subscribe and transmit with global path planner for accurate local re-routing.

ADAPTIVE-BASED CONTROL SCHEME FOR KINOVA JACO MANIPULATOR

SEPTEMBER 2022 - DECEMBER 2022

Virginia Tech - Robotics and Automation (Class), Final Project

Advisor: Prof. Kaveh Akbari Hamed

- Designed and implemented kinematic systems and environmental simulation for the robot arm.
- Designed and tested an adaptive Lyapunov-Based Robot Arm Control Scheme for position tracking and variable payload adjustment.
- Adapted the system further for adaptive Impedance Control given prescribed reaction tolerance.

UNPOWERED CUBE SATELITE DEVELOPMENT TEAM

SEPTEMBER 2021 - MAY 2022

Virginia Tech - Senior Design Capstone Project

Advisor: Prof. Erik Komendera

- Independently designed and simulated launch of satellite for passive pointing and thermal test of simulated design.
- Worked in the design and manufacturing of CubeSat frame and thermal smart-metal alloy deployment timer for desired deployment window.
- Successfully designed, manufactured, and qualified CubeSat for NASA GEVS 3U CubeSat standard.

ADAPTING 2D-TO-3D VISUALIZATION FOR DEMONSTRATION TRAINING

SEPTEMBER 2021 - DECEMBER 2021

Virginia Tech - Human-Robot Interaction (Class), Final Project

Advisor: Prof. Dylan Losey

- Worked in implementing TensorFlow depth model for 2D to 3D transition on non-calibrated video
- Adapted and implemented OpenCV body estimation model for non-compatible training video
- Developed Code for movement transition of human movement video to simulated robot movement
- Further developed real-time code to adapt visual movement to onscreen robot simulation movement

TECHNOLOGY SUMMARY

- **Software:** Robot Operating System (ROS 1 2), MATLAB, Arduino IDE, SolidWorks, Inventor.
- **Application Experience:** Kinematics, PID, State Feedback, Adaptive Control, DSP, Image Processing, Path Planning, Socket Communication, Mathematical Optimization.
- **Languages:** Python, C/C++.
- **Interests:** Controls, Human-Robot Interaction, Shared Autonomy, Reinforcement Learning, Process Automation.
- **Robots:** FrankaEmika Panda, Universal Robots UR10, UR5.