Nathan L. Butler

Graduate Research Assistant

3930 NW Witham Hill Dr. #226, Corvallis, OR 97330, United States
(319) 330-6155 | nathanbutler.nlb@gmail.com | linkedin.com/in/nlbutler | Website

EDUCATION

Oregon State University **Sep. 2023 - Present**
M.S. in Robotics; minor in Artificial Intelligence

Iowa State University **Aug. 2018 - May 2023**
B.S. in Mechanical Engineering; minors in Computer Science and Cyber-Physical Systems
GPA: 3.94/4.00

RELEVANT COURSEWORK

Deep Learning; Sequential Decision Making; Multiagent Systems; Learning-Based Control; Intelligent Agents and Decision Making; Kinematics, Dynamics, and Controls; Machine Learning for Cyber-Physical Systems; Principles of Artificial Intelligence

RECENT EXPERIENCE

Graduate Research Assistant, Robotic Decision Making Lab, Oregon State Univ. **Sep. 2023 – Present**

- Published work on hybrid decentralized planning algorithm that enables multi-robot team to integrate local and global information at ICRA 2025
- Using reinforcement learning with transformer models to enhance distributed multi-robot coordination in communication-restricted environments
- Collaborating on multi-university grant to develop coordination algorithms for teams of underwater robots

Undergraduate Research Assistant, ABE Automation and Robotics Lab, Iowa State Univ. **Jan. 2022 - Jul. 2023**

- Updated design of data collection robot by introducing modular components to eliminate downtime during recharging
- Developed weather-resistant casing for custom stereo camera with LED array, integrated 12 units into field robots
- Integrated robotic arm into existing field robot system to support dexterous data sampling techniques

Intern, Intelligent Control & Autonomy Group, NASA Glenn Research Center **Jan. 2021 - May 2021**

- Modeled physical responses of electrical hardware components as Simulink blocks and added components to NASA's Electrical Modeling and Thermal Analysis Toolbox for use in realistic digital twins of electric aircraft propulsion systems
- Developed multiple example Simulink models with accompanying tutorial documentation to reduce learning curve for new toolbox users

ADDITIONAL PROJECTS

MERL for Constrained Coordination: Multiagent Evolutionary RL for training agents in tightly coupled tasks with sparse rewards
Bravo MPC: Model Predictive Control for Reach Bravo robotic arm
Multiagent Routing as COP: Constraint Optimization Problem formulation with for multiagent orienteering problem
Robot Moisture Sensor: ROS-based hardware implementation of plant-probing robot
DQN for Task Scheduling: Deep Q-Network for multi-robot task scheduling
Space Mining Robot: Mechanical, software, and systems engineering work in multi-year collegiate-level robotics project
Crop Row Robot Steering: AE+CNN approach for robot steering commands from visual data within crop rows
Danfoss Lettuce Harvester: Robotic lettuce harvester concept developed in collaboration with national multidisciplinary team

SKILLS & TOOLS

Algorithms & Control: Deep Learning, Reinforcement Learning, Transformer Architectures, Genetic Algorithms, Motion Planning
Software: Python, PyTorch, ROS/ROS2, Linux, Java, SolidWorks, MATLAB/Simulink, GitHub, Docker
Mechanical: Rapid Prototyping, 3D Printing, Metal Fabrication, Wood Fabrication
Soft Skills: Research & Analysis, Algorithm Design, Software Design, Mechanical Design, Systems Engineering, Project Management, Technical Communication