Joshua R. Bhagat Smith

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Education

Oregon State University Corvallis, OR
PhD Robotics and AI 2020-2024

University of Arkansas Fayetteville, AR
MS Computer Science 2015-2017

University of Arkansas Fayetteville, AR
BS Computer Engineering 2011-2015

Skills

Software/Tools: C++ | Python | C# | Java | ROS2 | Pytorch | Pyro | Docker | DDS | ZeroMq | AWS | Protobuf | MATLAB

Technical Skills: Machine Learning | Bayesian Inference | Reinforcement Learning | Modeling & Simulation | Optimization | Sensor Fusion | Human-Robot Interaction | Multi-Robot Systems

Soft Skills: Leadership | Cross-functional Collaboration | Effective Communication | Technical Writing | Critical Thinking | Time Management | Research Presentation | Mentoring

Professional Experience

AI & ML Lead Engineer, Peraton 2024-

- Autonomy R&D team, developing novel autonomy capabilities for multi-robot systems.
  - Built a prototype agent communication language enabling the interoperability of autonomy frameworks.
  - Developed modeling and simulation infrastructure for uncrewed underwater vehicle to facilitate more in-depth evaluation of multi-robot systems, prior to deployment.
- Researched reinforcement learning techniques for safe, adaptive control laws for the DARPA LINC program.

Graduate Research Assistant, Oregon State University 2020-2024

- Led technical efforts for several projects focused on multi-robot systems and human-robot interaction.
- Adaptive Workload Estimation for Human-Robot Teams
  - Created an novel human state estimation system that leverages wearable sensors and Bayesian meta-learning to model the dynamics of cognitive workload.
  - Led a team of five researchers in training machine learning models, programming autonomous robots, and developing real-time physiological signal processing software.
- Transparent Management of Robot Swarm using Graph-based Dynamic Models
  - Developed human-swarm interface that allowed a single human to simultaneously control four robot swarms each containing 200 agents.
  - Enhanced transparency of the system by leveraging a heuristic prediction and a discrete-time Markov chain algorithm to inform users about the swarm's long-term behavior.
- Multi-Vehicle Management for Drone Delivery Systems
  - Collaborated to design and conduct human subject evaluations to establish appropriate performance parameters for human supervision of multiple uncrewed aircraft (i.e., 500+).

Senior Software Engineer, HERE Technologies 2017-2020

- Highly Autonomous Driving group. Our team built an automated, high-accuracy map to enable autonomous driving functionality from large scale vehicle sensor systems.
- Assisted in designing machine learning and statistical models of vehicle sensor data.
- Developed cloud infrastructure to scale data processing to analyze millions of kilometers daily.

Research Intern, NASA Langley Research Center Summer 2016

- Research near-ground UAV navigation methods to avoid fixed obstacles such as trees or power lines.