

# Joshua R. Bhagat Smith

PHD STUDENT · ROBOTICS & ARTIFICIAL INTELLIGENCE

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## Education

### Oregon State University

PHD ROBOTICS AND ARTIFICIAL INTELLIGENCE

- Advisor: Dr. Julie A. Adams
- Dissertation: "Adaptive Workload Estimation using Few-Shot Learning"

Corvallis, OR

2020 - present

### University of Arkansas

MS COMPUTER SCIENCE

- Advisor: Dr. Michael Gashler
- Thesis: "An investigation of how neural networks learn from the experiences of peers through periodic weight averaging."

Fayetteville, AR

2015 - 2017

### University of Arkansas

BS COMPUTER ENGINEERING

- Minors in Math, Physics

Fayetteville, AR

2011 - 2015

## Professional Experience

- 2020- **Graduate Research Assistant**, Collaborative Robotics and Intelligent Systems Inst., Human Machine Teaming Lab
- 2017-2020 **Senior Cloud Infrastructure Engineer**, HERE Technologies
- 2015-2017 **Graduate Teaching Assistant**, Computer Science and Computer Engineer Dept., University of Arkansas
- 2016 **Research Intern**, Dynamic Systems and Controls Branch, NASA Langley Research Center

## Publications

### PUBLISHED

- A. Moore, M. Schubert, T. Fang, **J. Smith**, N. Rymer. "Lidar-derived navigational geofences for low altitude flight operations," in *Proc. AIAA AVIATION FORUM Virtual Event*. 2020.
- A. Moore, M. Schubert, S. Balachandran, M. Consiglio, C. Munoz, **J. Smith**, D. Lewis, P. Schneide. "Inspection of electrical transmission structures with UAV path conformance and lidar-based geofences," in *Proc. of IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT) Singapore*. 2018.
- J. Smith**, M. Gashler. "An investigation of how neural networks learn from the experiences of peers through periodic weight averaging," in *Proc. IEEE International Conference on Machine Learning and Applications (ICMLA) Cancun, Mexico*. 2017.

### IN SUBMISSION

- J. Bhagat Smith**, P. Baskaran, J.A. Adams. "Decomposing Physical Workload Estimation for Human-Robot Teams" in *Proc. IEEE International Conference on Human-Machine Systems*, 2022.
- P. Baskaran, , **J. Bhagat Smith**, J.A. Adams. "Visual Task Recognition for Human-Robot Teams" in *Proc. IEEE International Conference on Human-Machine Systems*, 2022.
- J. Bhagat Smith**, P. Baskaran, J.A. Adams. "Influence of Honeybee Inspired Drifter Agents." *PloS one*, 2022.

### IN PREPARATION

- J. Bhagat Smith**, P. Baskaran, J.A. Adams. "Guard Agents and Their Impact on Collective Decision Making."

## Teaching Experience

Spring 2017 **Artificial Intelligence**, Teaching Assistant  
 Fall 2016 **Programming Foundations I**, Teaching Assistant  
 Spring 2016 **Computer Organization**, Teaching Assistant  
 Fall 2015 **Programming Foundations I**, Teaching Assistant

## Research Experience

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### Oregon State University - Robotics

Corvallis, OR

ADVISOR: DR. JULIE A. ADAMS

Fall. 2020 - Present

- Dissertation: "Adaptive Workload Estimation using Few-Shot Learning"
  - Use few shot learning to adapt workload estimation models to unseen tasks
  - Design & Conduct Human Subject Studies
  - Physiological Data Processing & Analysis
  - Machine Learning & Probabilistic Model Development
- Defense Advanced Research Projects Agency Project: "Resilient Emergent Properties for Autonomous Agent Interactions"
  - Develop agent-based model for evaluating foreign agents trying to influence collective decision making algorithms.
  - Non-parametric Statistical Modelling
  - Data Analysis
- Office of Navy Research Project: "Transparent Management of Hub-based Colonies using a Graph-based Dynamic Model"
  - Interface design to enable a single human to more effectively control four groups of 200 robots
  - Design & Conduct Human Subject Studies
  - Data Analysis

### University of Arkansas - Computer Science

Fayetteville, AR

ADVISORS: DR. MICHAEL GASHLER

2015-2017

- Thesis: "An investigation of how neural networks learn from the experiences of peers through periodic weight averaging."
  - Understanding the impact of various network topologies on a federated learning with feed-forward neural networks

### NASA Langley Research Center - Dynamic Systems and Controls Branch

Hampton, VA

ADVISORS: DR. ANDREW MOORE

2016

- Project: "Extracting Lidar-based Geofences for UAV Inspection of Electrical Transmission Structures"
  - Develop and evaluate different clustering algorithms for creating geofences for UAVs inspecting electrical power lines.

## Mentoring

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2022 **Simone Angelo S. Toribio**, Research Experience for Undergraduates Student Mentor,  
 Oregon State University

Corvallis, OR

## Skills

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- **Programming Languages:** Python, C++, Java, C, Scala
- **Tools:** Pytorch, Tensorflow, Pandas, Git
- **Math:** Pattern Recognition, Density Estimation, Deep Neural Networks, Statistic Analysis.