

Jayam Patel

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EDUCATION

- Ph.D. in Robotics Engineering** Feb. 2021
Worcester Polytechnic Institute (WPI), USA
• Thesis: Improving Human Performance in Multi-Human Multi-Robot Interaction
- Certificate in College Teaching** May 2019
Higher Education Consortium of Central Massachusetts (HECCMA), USA
• Professional training on the trends of teaching methods and student psychology
- M.S. in Robotics Engineering** May 2016
Worcester Polytechnic Institute (WPI), USA
• Thesis: Gesture-Based Navigation and Localization of a Smart Wheelchair using Fiducial Markers
- B.Eng. in Electronics and Communication Engineering** May 2012
Gujarat Technological University (GTU), India
• Final Project: Advanced Reliable Intelligent and Efficient Security System (ARIESS)

CAREER HIGHLIGHTS

- Presented research** at 7 colloquiums and conferences
Research supervisor to 4 graduate students and 13 undergraduate students at WPI, USA
Academic manuscript reviewer for 3 renowned journals and 8 prestigious conferences
Invited as a speaker for STEM and robotics outreach program for 16 schools (5000+ students) across India
Recognition by Shri Narendra Modi, Prime Minister of India, for intellectual contribution to the field of Robotics
Patent applied (File No. 1584/MUM/2013) for *Security System* that isolates valuables & humans from the culprit
Certificate for academic excellence (B.Eng. Batch Topper) at Gujarat Technological University, India
Robotics trainer and mentor in basic robot building workshops to 100+ students, 9-35 years old, India

KEY SKILLS

- Programming:** C++, C#, Buzz, Python, C, MATLAB, HTML, LaTeX
Robotic Tools: ARGoS, ROS, Gazebo, RVIZ, MoveIt
Hardware: Magic Leap, Leap Motion, MYO/EMG Sensor, Atmel, Arduino, MSP430, ARM, 89cXX-80xx Series
Software Tools: Unity, Vuforia, SPSS, VS Code, SVN, Git, Qt Creator, Eclipse, MATLAB & Simulink

RESEARCH EXPERIENCE

- Research Assistant, NEST Lab, Worcester Polytechnic Institute, USA** Aug. 2016 – Present
Supervisor: *Prof. Carlo Pinciroli*
• Worked on multi-human multi-robot framework to investigate methods and devices for an effective interaction
• Built a novel mixed reality-based and a cloud-based interface for testing usability and behaviour of human operators
• Investigated the impact of mixed-granularity of control, information transparency, inter-human communication and loss of information on human operators' performance
- Research Assistant, RIVeR Lab, Worcester Polytechnic Institute, USA** Aug. 2014 – Apr. 2016
Supervisor: *Prof. Taskin Padir*
• Worked on a gesture-based navigation technique to manipulate a smart wheelchair for the elderly and the specially-abled
• Implemented an indoor localization technique using April Tags as fiducial markers
• Designed a simulator to test and verify results for all the test cases
- Research Assistant, Ahmedabad Robot Club, India** Aug. 2008 – May 2013
Supervisor: *Dr. Ronak Shodhan*
• Worked on various robotics and automation projects
• Fabricated a security system to isolate the residents of the house to avoid any fatality (Patent Applied)
• Designed innovative solutions for social causes in India

TEACHING EXPERIENCE

- Course Instructor, Worcester Polytechnic Institute, USA** Jan. 2020 – May 2020
Swarm Intelligence, Graduate Course
- Teaching Assistant & Guest Lecturer, Worcester Polytechnic Institute, USA** Jan. 2015 – May 2019
5 Graduate Classes and 11 Undergraduate Classes, Nominated as the best TA at WPI

Course Assistant, University of Southern California, USA Jan. 2014 – May 2014
Artificial Intelligence, Graduate Course

Lecturer and Mentor, Ahmedabad Robot Club, India Aug. 2008 – May 2013
100+ Students (9-35 year old)

PUBLICATIONS

5. Jayam Patel, Prajankya Sonar and Carlo Pinciroli. **On Multi-Human Multi-Robot Remote Interaction: A Study of Transparency, Inter-Human Communication and Information Loss in Remote Interaction.** *Submitted in the Springer Journal of Swarm Intelligence*
4. Jayam Patel, Tyagaraja Ramaswamy, Zhi Li and Carlo Pinciroli. **Level of Transparency in Multi-Human Multi-Robot Interaction.** *Submitted in the IEEE Transactions on Human-Machine Systems (THMS).*
3. Jayam Patel, Tyagaraja Ramaswamy, Zhi Li and Carlo Pinciroli. **Inter-Human Communication in Multi-Human Multi-Robot Interaction.** *Submitted in the IEEE Robotics and Automation Letters (RA-L).*
2. Jayam Patel and Carlo Pinciroli. **Improving Human Performance Using Mixed Granularity of Control in Multi-Human Multi-Robot Interaction.** *In IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). 2020.*
1. Jayam Patel, Yicong Xu and Carlo Pinciroli. **Mixed-Granularity Human-Swarm Interaction.** *In IEEE/RSJ International Conference on Robotics and Automation (ICRA). 2019.*

CERTIFICATIONS

Reinforcement Learning Specialization, *University of Alberta, Coursera Specialization* Expected May 2021
Deep Learning Specialization, *deeplearning.ai, Coursera Specialization* Jul. 2020
Introduction to Psychology, *University of Toronto, Coursera Certification* Jul. 2020
Machine Learning, *Stanford University, Coursera Certification* Jun. 2020

KEY PROJECTS

Improving Performance in Multi-Human Multi-Robot Interaction, *NEST Lab, WPI* Jan. 2019 – Present
• Designed an augmented reality-based and a cloud-based interface for multi-human multi-robot interaction
• Evaluated various research aspects with 8 user studies involving 122 participants

Human Swarm Interfaces for Disaster Management, *NEST Lab, WPI* Jan. 2016 – Present
• Implemented Human Interaction devices to interface with Swarm Robots
• Interfaces include: EMG Sensors, Leap Motion, Virtual/Augment/Mixed Reality, Handheld Devices, Magic Leap One

Author Age and Gender Prediction from Written Samples, *Course Project, WPI* Aug. 2016 – Dec. 2016
• Predicted age and gender of an author using Machine Learning
• Implemented k-Nearest Neighbours, Decision Tree and Support Vector Machine

Gesture-Based Navigation & Localization of a Smart Wheelchair, *RIVeR Lab, WPI* Aug. 2015 – May 2016
• Built EMG interface to control wheelchair navigation
• Designed indoor localization of wheelchair using an off-the-shelf camera and APRIL Tags

Gesture-Based sensor fusion SLAM, *Course Project, WPI* Jan. 2016 – May 2016
• Implement MATLAB-ROS Communication
• Designed PID controller to generate smooth trajectory for turtle bot

ROS-GAZEBO Modeling of Neurosurgery Robot, *Course Project, WPI* Jan. 2015 – May 2015
• Created ROS-Gazebo bridge for simulating a no-go region for collision avoidance
• Designed an algorithm to plan a collision free trajectory of the MRI robot

EXTRACURRICULAR ACTIVITY

Head of Technical Events, *IEEE Robotics and Automation Society (RAS), WPI, USA* Aug. 2019 – Present
Member, *Rho Beta Epsilon, Robotics Honor Society, WPI, USA* Mar. 2019 – Present
Robotics Career Advisor, *Boarding Pass for Success, Canada* Jan. 2019 – Present
Speaker and Mentor, *Robotics Outreach and Awareness, India* Jan. 2009 – Present
President, *South Asian Student Association (SASA), WPI, USA* Aug. 2015 – Jul. 2016
College Head, *YUVA College Unstoppable, an NGO, India* Aug. 2006 – May 2012
Volunteer and Teacher, *Prayas, an NGO, India* Aug. 2008 – May 2012