

Jayam Patel

PH.D. · ROBOTICS SOFTWARE DEVELOPER · LEDDARTECH

214-850 Ch. de la Canardiere, Quebec, QC, Canada G1J 0J1

☎ (+1)406-556-6463 | ✉ pateljayam@gmail.com, jupatel@wpi.edu | 🏠 www.jayampatel.com | 👤 pateljayam

Research Interests

Autonomous Driving · Swarm Robotics · Multi-Robot Systems · Human-Robot Interaction · Real-Time Systems · SLAM · Human Factors & Ergonomics · Cognitive Engineering · Augmented Reality · Mixed Reality · Virtual Reality · Human Interfaces · Collective Transport · Robot Navigation

Education

Formal Education

Ph.D. in Robotics Engineering

WORCESTER POLYTECHNIC INSTITUTE (WPI)

- Thesis: Improving Human Performance in Multi-Human Multi-Robot Interaction

Worcester, MA, USA

Feb. 2021

Certificate in College Teaching

HIGHER EDUCATION CONSORTIUM OF CENTRAL MASSACHUSETTS (HECCMA)

- Professional training on the trends of teaching methods and student psychology

Worcester, MA, USA

May 2019

M.S. in Robotics Engineering

WORCESTER POLYTECHNIC INSTITUTE (WPI)

- Thesis: Gesture-Based Navigation and Localization of a Smart Wheelchair using Fiducial Markers

Worcester, MA, USA

May 2016

B.Eng. in Electronics and Communication Engineering

GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

- Final Project: Advanced Reliable Intelligent and Efficient Security System (ARIESS) (Applied for Patent)

Ahmedabad, GJ, India

May 2012

Further Education

Reinforcement Learning Specialization

UNIVERSITY OF ALBERTA, COURSERA Specialization

- Four course specialization covering concepts of reinforcement learning.

USA

Exp. Jul. 2021

Deep Learning Specialization

DEEPLARNING.AI, COURSERA Specialization

- Five course specialization covering different types of Neural Networks and parameter tuning.

USA

Jul. 2020

Introduction to Psychology

UNIVERSITY OF TORONTO, COURSERA Certification

- Online course covering concepts of psychology, social psychology and mental illness.

USA

Jul. 2020

Machine Learning

STANFORD UNIVERSITY, COURSERA Certification

- Online course covering concepts of machine learning and algorithms.

USA

Jun. 2020

Industry Experience

Robotics Software Developer

LEDDARTECH

- Research on tools and technologies used in self-driving vehicles
- Design path-planning algorithms, decision maker, and localization system for the autonomous vehicle

Quebec City, QC, Canada

July. 2021 - Present

Consultant

EDCALIBRE INC.

- Create technical content to gamify mathematical concepts for school students
- Research on technical interfaces to better suite the gamification

Canada & India
Apr. 2021 - Present

Robotics Career Consultant

BOARDING PASS FOR SUCCESS

- Mentoring students around the world to help them build a career in robotics
- Introduce research methodologies and tools to students

USA, Canada, & India
May 2018 - Present

Research Experience

Ph.D. Researcher, NEST Lab, Worcester Polytechnic Institute

SUPERVISOR: PROF. CARLO PINCIROLI

- Worked on multi-human multi-robot framework to investigate methods and devices for an effective interaction
- Built a mixed reality-based and a cloud-based interface for testing human operators' usability and behaviour
- Investigated the impact of mixed-granularity of control, information transparency, human communication and loss of information on human operators' performance

Worcester, MA, USA
Aug. 2016 - May 2021

M.S. Thesis, RIVeR Lab, Worcester Polytechnic Institute

SUPERVISOR: PROF. TASKIN PADIR

- Worked on a gesture-based navigation technique to manipulate a smart wheelchair for the elderly and the specially-abled
- Implemented a indoor localization technique using April Tags as fiducial markers
- Designed a simulator to test and verify results for all the test cases

Worcester, MA, USA
Aug. 2014 - Apr. 2016

Researcher, Ahmedabad Robot Club

SUPERVISOR: DR. RONAK SHODHAN

- Worked on various robotics and automation projects
- Designed a security system to isolate the residents of the house to avoid any fatality (Patent Applied)
- Trained 100+ Students (9-35 year old) in "Basics of Robotics" (Line and Wall Following Robots)

Ahmedabad, GJ, India
Aug. 2008 - May 2013

Teaching

Graduate Courses

Course Instructor, Swarm Intelligence, WPI

INSTRUCTORS: PROF. CARLO PINCIROLI, JAYAM PATEL

Worcester, MA, USA
Spring 2020

Teaching Assistant and Guest Lecturer, Swarm Intelligence, WPI

INSTRUCTOR: PROF. CARLO PINCIROLI

Worcester, MA, USA
Spring 2019, Spring 2018.

Teaching Assistant, Robot Dynamics, WPI

INSTRUCTOR: PROF. MAHDI AGHELI, PROF. WILLIAM R. MICHALSON

Worcester, MA, USA
Fall 2018.

Teaching Assistant and Guest Lecturer, Robot Control, WPI

INSTRUCTOR: PROF. MAHDI AGHELI

Worcester, MA, USA
Fall 2018, 2017.

Course Assistant, Foundations of Artificial Intelligence, University of Southern California

INSTRUCTOR: PROF. SHEILA TEJADA

Los Angeles, CA, USA
Spring 2014.

Undergraduate Courses

Teaching Assistant, Frontiers Program, Physics, WPI

INSTRUCTOR: PROF. P. K. ARAVIND

Worcester, MA, USA
Summer 2017.

Teaching Assistant and Lab Lecturer, General Physics-Mechanics, WPI

INSTRUCTOR: PROF. P. K. ARAVIND

Worcester, MA, USA
Spring 2017, 2016. Fall 2016, 2015.

Teaching Assistant and Lab Lecturer, General Physics-Electricity And Magnetism, WPI

INSTRUCTOR: PROF. P. K. ARAVIND

Worcester, MA, USA
Spring 2017, 2016. Fall 2016, 2015.

Teaching Assistant and Lab Lecturer, Embedded Computing in Engineering Design, WPI

INSTRUCTOR: PROF. SUSAN JARVIS

Worcester, MA, USA
Spring 2015.

Teaching Assistant and Lab Lecturer, Introduction to Digital Circuit Design, WPI

INSTRUCTOR: PROF. XINMING HUANG

Worcester, MA, USA

Spring 2015.

Lecturer and Mentor, Basics of Robotics, Ahmedabad Robot Club

SUPERVISOR: DR. RONAK SHODHAN

Ahmedabad, GJ, India

2008 - 2013.

Honors & Achievements

Patent Applied (#1584/MUM/2013)

ADVANCED RELIABLE INTELLIGENT AND EFFICIENT SECURITY SYSTEM

Ahmedabad, GJ, India

2013

Academic Excellence (B.Eng. Batch Topper)

GUJARAT TECHNOLOGICAL UNIVERSITY

Ahmedabad, GJ, India

2012

Recognition by Mr. Narendra Modi, Prime Minister of India

FOR INTELLECTUAL CONTRIBUTION TO THE FIELD OF AUTOMATION AND ROBOTICS

Ahmedabad, GJ, India

2011

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.** *Under Review. Submitted to 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.** *Under Review. Submitted to 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.** *Under Review. Submitted to 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.*

Presentations

- [7] **Improving Human Performance Using Mixed Granularity of Control in Multi-Human Multi-Robot Interaction.** Paper Presentation, *IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). 2020.*
- [6] **Improving Human Performance Using Mixed Granularity of Control in Multi-Human Multi-Robot Interaction.** Poster Presentation, *Northeast Robotics Colloquium (NERC). 2019.*
- [5] **Improving Human Performance Using Mixed Granularity of Control in Multi-Human Multi-Robot Interaction.** Poster Presentation, *WPI Robotics Engineering 10-Year Anniversary Research Symposium. 2019.*
- [4] **Mixed-Granularity Human-Swarm Interaction.** Paper Presentation, *IEEE/RSJ International Conference on Robotics and Automation (ICRA). 2019.*
- [3] **Mixed-Granularity Human-Swarm Interaction.** Poster Presentation (Finalist), *Graduate Research Innovation Exchange (GRIE), WPI. 2019.*
- [2] **Mixed-Granularity Human-Swarm Interaction.** Presentation, *Robotics Engineering Department Colloquium, WPI. 2019.*
- [1] **Human-Swarm Interaction for Disaster Management.** Poster Presentation, *Graduate Research Innovation Exchange (GRIE), WPI. 2018.*

Awards

2019 ICRA Travel Award, \$500

2019 WPI Travel Award, \$500

Key Projects

Multi-Human Multi-Robot Interaction

NEST LAB, WPI

- 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

Worcester, MA, USA

Jan. 2019 - May 2021

Human Swarm Interaction for Disaster Management

NEST LAB, WPI

- Implement Human Interaction devices to interface with Swarm Robots
- Interfaces include: MYO (EMG Band), Leap Motion, Augment Reality, Hand-held tablets, Magic Leap One

Worcester, MA, USA

Jan. 2016 - May 2021

Author Age and Gender Prediction from Written Samples

ARTIFICIAL INTELLIGENCE COURSE PROJECT (TEAM OF 4)

- Predicted age and gender of an author using Machine Learning
- Implemented algorithms - k-Nearest Neighbours, Decision Tree and Support Vector Machine

Worcester, MA, USA

Aug. 2016 - Dec. 2016

Gesture-Based Navigation & Localization of a Smart Wheelchair

M.S. THESIS, RIVER LAB, WPI

- Built EMG interface to control wheelchair navigation
- Designed indoor localization of wheelchair using an of the shelf camera and APRIL Tags

Worcester, MA, USA

Aug. 2015 - May 2016

Gesture-Based sensor fusion SLAM

ADVANCED ROBOT NAVIGATION COURSE PROJECT (TEAM OF 2)

- Implemented MATLAB-ROS Communication
- Designed PID controller to generate smooth trajectory for turtle bot

Worcester, MA, USA

Jan. 2016 - May. 2016

ROS-GAZEBO Modeling of Neurosurgery Robot

ROBOT DYNAMICS COURSE PROJECT (TEAM OF 4)

- 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

Worcester, MA, USA

Jan. 2015 - May. 2015

Editorial Activities

Journal Reviewer

- Springer Journal on Swarm Intelligence.
- IEEE Robotics and Automation Letters (RA-L).
- Springer Journal on Virtual Reality (VIRE)
- Science Direct Journal of Virtual Reality & Intelligent Hardware (VRIH).

Conference Reviewer

- International Conference on Intelligent Robots and Systems (IROS). 2019, 2021.
- International Conference on Robotics and Automation (ICRA). 2019, 2020, 2021.
- The Association for the Advancement of Artificial Intelligence Conference (AAAI). 2020.
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS). 2020.
- International Conference on Ubiquitous Robots (UR). 2020.
- International Symposium on Multi-Robot and Multi-Agent Systems (MRS). 2019.
- Genetic and Evolutionary Computation Conference (GECCO). 2018.
- International Conference on Swarm Intelligence (ANTS). 2018.

Invited Talks

- [16] “**Robotics: Today and Tomorrow! (Webinar)**”, Government Engineering College, Bharuch, GJ, India. Sep. 29, 2020.
- [15] “**Robotics in Industry 4.0 (Webinar)**”, KJ Somaiya College Of Engineering, Mumbai, MH, India. Jun. 29, 2020.
- [14] “**ECE Opportunities in India, USA and Canada (Webinar)**”, Indus University, Ahmedabad, GJ, India. May. 30, 2020.
- [13] “**Robotic applications around the world (Webinar)**”, Knowledge Studio, Surat, GJ, India. May. 12, 2020.
- [12] “**Research and Development in the field of Robotics**”, KJ Somaiya College Of Engineering, Mumbai, MH, India. Jan. 8, 2020.

- [11] **“Research and Development in the field of Robotics”**, Sankalchand Patel University, Visnagar, GJ, India. Jan. 2, 2020.
- [10] **“Today in Robotics.”**, Mechanical Engineering Department, Government Polytechnic, Ahmedabad, GJ, India. Dec. 30, 2019.
- [9] **“Today in Robotics.”**, Electrical and Computer Engineering Department, Government Polytechnic, Ahmedabad, GJ, India. Dec. 20, 2019.
- [8] **“Research and Development in the field of Robotics”**, Silver Oak College of Engineering and Technology, Ahmedabad, GJ, India. Dec. 19, 2019.
- [7] **“How to make simple Robots!”**, Government Polytechnic For Girls, Surat, GJ, India. Dec. 18, 2019.
- [6] **“Today in Robotics.”**, Government Polytechnic For Girls, Surat, GJ, India. Dec. 13, 2019.
- [5] **“Advancements in the Field of Robotics.”**, St. Kabir School, Drive-In New Branch, Ahmedabad, GJ, India. Jan. 16, 2019.
- [4] **“Advancements in the Field of Robotics.”**, St. Kabir School, Drive-In Old Branch, Ahmedabad, GJ, India. Jan. 16, 2019.
- [3] **“Robotics Research Tools and Technologies”**, National Institute of Technology (NIT), Surat, GJ, India. Jan. 9, 2019.
- [2] **“Advancements in the Field of Robotics.”**, St. Kabir School, Naranpura Branch, Ahmedabad, GJ, India. Jan. 5, 2019.
- [1] **“Advancements in the Field of Robotics.”**, St. Kabir School, Navrangpura Branch, Ahmedabad, GJ, India. Jan. 4, 2019.

Supervising

Graduate Students

Prajankya Sonar , Human Swarm Interaction Interface Development GRADUATE DIRECTED RESEARCH, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Nov. 2019 - May 2021
Tyagaraja Ramaswamy , Localization for Swarm Robots GRADUATE DIRECTED RESEARCH, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Jan. 2019 - May. 2020
Christopher Dalessio , Motion Planning for Swarm Robots GRADUATE DIRECTED RESEARCH, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Jan. 2019 - May. 2019
Yicong Xu , Goal Based Human-Swarm Interaction for Collaborative Transport M.S. THESIS, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Aug. 2017 - May. 2018

Undergraduate Students

Harrison James, Paul Mara, Vlad Stelea , swARm Project UNDERGRADUATE MAJOR QUALIFYING PROJECT, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Aug. 2020 - May 2021
Eula Zhong, Kent Libby, Noah Van Stralen , Diagnostic Tools for Swarm Robots UNDERGRADUATE MAJOR QUALIFYING PROJECT, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Aug. 2019 - May. 2020
Danny Sullivan, Eric Arthur, Przemek Gardias , Gestures for Human Swarm Interaction UNDERGRADUATE MAJOR QUALIFYING PROJECT, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Aug. 2019 - May. 2020
Alexandra Wheeler, Erika Snow, Jerish Brown, Josiah Boucher , Diagnostic Tools for Swarm Robots UNDERGRADUATE MAJOR QUALIFYING PROJECT, CO-SUPERVISOR	<i>Worcester, MA, USA</i> Aug. 2018 - May. 2019
Members of Ahmedabad Robot Club , 100+ Students, Maze Solving Robot ROBOTICS PROJECT, SUPERVISOR	<i>Ahmedabad, GJ, India</i> Aug. 2008 - May. 2013

Press Coverage

- [5] **Tej Gujarati**. (Aug. 29, 2020). “Guiding young minds in the field of Robotics.” (Original article in Gujarati)
- [4] **Education Times, The Times of India Newspaper**. (Sep. 3, 2012). “The likeness in learning.”
- [3] **Daily News and Analysis (DNA) Newspaper**. (Aug. 30, 2011). “Robotics enthusiasts of Ahmedabad test their mean machines.”
- [2] **The Indian Express Newspaper**. (Aug. 28, 2011). “Robot slugfest attracts hundreds to city.”
- [1] **City Bhaskar Gujarati Newspaper**. (Aug. 20, 2011). “Robots made by students ran with pride.” (Original article in Gujarati)

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

Organization Memberships

- **Member**, IEEE
- **Member**, IEEE Robotics and Automation Society
- **Member**, IEEE Systems, Man, and Cybernetics Society
- **Member**, ACM

Language Proficiency

Hindi Native
Gujarati Native
English Fluent

Extracurricular Activity

Leadership

IEEE Robotics and Automation Society, WPI Chapter

HEAD OF TECHNICAL EVENTS

Worcester, MA, USA

2020 - 2021

Rho Beta Epsilon, Robotics Honor Society, WPI

MEMBER AND VOLUNTEER

Worcester, MA, USA

2019 - 2021

South Asian Student Association(SASA), WPI

PRESIDENT

Worcester, MA, USA

2015 - 2016

Student Outreach

Boarding Pass for Success

TECHNICAL ADVISOR AND MENTOR FOR SCHOOL AND COLLEGE STUDENTS

USA, Canada and India

2018 - PRESENT

Independent Activities for Awareness in the Field of Robotics

MENTOR AND GUIDE STUDENTS OF ALL AGES TO HELP THEM FIND A CAREER IN THE FIELD OF ROBOTICS

USA, Canada and India

2009 - PRESENT

Community Service

YUVA Unstoppable at LJ Engineering (NGO)

COLLEGE AMBASSADOR

Ahmedabad, GJ, India

2009 - 2012

PRAYAS at LJ Engineering (NGO)

VOLUNTEER

Ahmedabad, GJ, India

2008 - 2012

YUVA Unstoppable (NGO)

COLLEGE AMBASSADOR

Ahmedabad, GJ, India

2006 - 2009

Independent Activities with My Mother

THANK YOU, MOM (PRAGNA PATEL)

Ahmedabad, GJ, India

2000 - 2013

Life Guidance and Counselling

Reiki and Tarot Cart Practitioner

USUI AND KARUNA REIKI MASTER, THE INTERNATION CENTER OF REIKI TEACHING (ICRT) LICENSED

USA, Canada and India

2006 - PRESENT