

RAHUL R. RAMACHANDRAN

Edinburgh, Scotland, UK

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Education

University of the West of England Bristol

Master of Science by Research in Robotics

Jan. 2019 – Sep. 2020

Bristol, United Kingdom

Tokai University, Shonan Campus

Visiting Research Student in Robotics (Semester Abroad Program)

Oct. 2017 – Feb. 2018

Hiratsuka, Japan

SRM Institute of Science and Technology

Bachelor of Technology in Mechatronics Engineering

July 2014 – June 2018

Kattankulathur, Chennai, India

Relevant Coursework

- Research Investigation, Planning and Methods for change
- Human-Robot Interaction
- Advanced Control and Dynamics
- Electromechanical Systems Integration
- Design of Mechatronics Systems
- Sensors and Actuators
- Object Oriented Programming

Recent Publications

A Modular, Tendon Driven Variable Stiffness Manipulator with Internal Routing for Improved Stability and Increased Payload Capacity | *paper* [🔗](#)

Kyle L. Walker, Alix J. Partridge, Hsing-Yu Chen, **Rahul R Ramachandran**, Adam A. Stokes, Kenjiro Tadakuma, Lucas Cruz Da Silva and Francesco Giorgio-Serchi
IEEE International Conference on Robotics and Automation (ICRA) 2024

Static and Temporal Differences in Social Signals Between Error-Free and Erroneous Situations in Human-Robot Collaboration | *paper* [🔗](#)

D.E. Cahya, **Rahul R Ramakrishnan**, Manuel Giuliani
11th International Conference on Social Robotics (ICSR) 2019

Research Experience

Bristol Robotics Laboratory [🔗](#)

Bristol, United Kingdom

Advisor: Prof. Manuel Giuliani

Human's Social Signals during Error Situations in Human-Robot Interaction

- A multi-modal dataset was prepared after manual annotation of 600 audio-video recordings of error situations collected from a HRI user study. Using the datasets a model was trained and tested with PART, Naive Bayes and Random Forest machine learning classifier algorithms.
- The classifiers were evaluated using 10-fold cross validation and percentage-split validation techniques. Correlation between social signals and different error types for each participant was visualized using Weka workbench.

Bristol Robotics Laboratory

Graduate Research Student

Advisor: Prof. Manuel Giuliani

Effectiveness of verbal communication with conjunction of gestures and facial expression in human-robot interaction | *project page* [🔗](#)

- Conducted a user study to evaluate the optimal level of verbal and non-verbal communication and the use of facial emotion recognition as feedback by a robot during human-robot interaction. Nao robot was used for this study.

Autonomous Systems Lab, SRM Institute of Science and Technology [🔗](#)

Undergraduate Research Student

Advisor: Sivanathan K.

Collaborative control for autonomous agents at intersection | *paper* [🔗](#)

- Tried to answer the question of how to benchmark intersection management algorithms by providing some factors that affect the navigation of autonomous vehicles at intersection and by analysing different planning algorithms used so far.

July 2019 – July 2020

Graduate Research Student

Feb. 2019 – Aug. 2019

Bristol, United Kingdom

Oct. 2017 – Dec. 2018

Kattankulathur, Chennai, India

Modeling and validation of a new continuum robot manipulator design

- Studied the kinematics model of a multi-segment parallel continuum robot manipulator. Also developed a concept prototype and a PID controller for testing.

Projects**SRM ASV(Autonomous Surface Vehicle) | Video  | Python, C++, LabVIEW, Eagle** **March 2015 - July 2018**

- Designed and fabricated a power distribution board with a protection circuit for various on-board low and high voltage sensors and actuators. Implemented image processing, object detection and tracking for vision based navigation.

Mechatronics design approach based implementation of a Ball-Plate balancing system **Jan. 2017 - May 2017***MATLAB, Arduino programming*

- A PID controller was designed to control a 2 DOF ball-plate balancing system. Kalman filter was used to reduce the noise and make the control system function more efficiently and a kinect sensor was used to track the ball position.

Design of Agile Wedged Robot (SRM DIRT) | Video  | SolidWorks **Aug. 2016 - Oct. 2016**

- Design considerations and wedge angle calculations were obtained in order to get the optimal speed and maneuverability.

Agricultural Field and Plant Health Investigator | Video  | LabVIEW **Aug. 2015 - Nov. 2015**

- Designed and developed a semi-autonomous quadcopter, pesticide sprayer control and plant health monitoring systems using the National Instruments Graphical System Design, enabled by the LabVIEW RIO Architecture.

Table Top and Obstacle Avoidance Robot | Video  | Embedded C **June 2015**

- Using four infrared sensors as input, programmed a atmega16 microcontroller using AVR Studio to control the motion of a differential drive omnidirectional caster robot from not falling off a table.

Technical Skills**Languages:** Python, C++, Embedded C, Lua, Shell**Software and IDEs:** ROS1/ROS2, Nvidia Isaac Sim, MATLAB, LabVIEW, Weka, Darknet, OpenCV, Ardupilot, PX4, L^AT_EX, Git, Rviz, Gazebo, Arduino IDE, Microsoft Visual Studio, SolidWorks, Autodesk Fusion, Eagle**Hardware Platforms:** Nvidia Jetson Nano, Raspberry Pi, Arduino, Pixhawk Autopilot, Beagle Bone Black, NI MyRIO, NI DAQmx, NI single-board RIO (DaNI robot), Nao Robot, Pepper Robot, ABB YuMi Robot, 3D Printers, Laser cutting machine, Oscilloscopes, Lathes, Power Saw, Soldering Iron**OS:** Linux(Ubuntu), Windows**Work Experience****Engineer****Sep. 2022 - Present***The National Robotarium, Heriot-Watt University **Edinburgh, Scotland, UK*

- Working on motion planning, control, robotic design and systems integration with applications in Marine Robotics and assembly line pick and place manipulation tasks.

Research and Development Engineer - Robotics and Autonomous Systems **May 2021 - Aug. 2022***VEDA Aeronautics Pvt. Ltd. **Greater Noida, Delhi NCR, India*

- Worked on visual servoing and monocular visual-inertial SLAM. Implemented real-time object detection and recognition using deep neural networks. Also implemented a tracking algorithm using OpenCV in python.
- Design and development of system level architecture for hard real-time integrated embedded systems.
- Vision and GPS based motion planning and control of aerial systems.

Robotics Instructor**Feb. 2021 - April 2021***Brainobots Kuwait, C/O Brillianz Consulting and Training Co. **Remote work, Kuwait*

- Taught fundamentals of electrical and electronics, arduino programming using graphical blocks and how to design simple circuits and build a wheeled robot for 8-16 years old kids with a focus on practical hands-on activities.
- Prepared all the coursework and Graded quizzes and other assignments. In total 22 students.

Mechatronics Engineer/Intern**July 2019 - March 2020***MTJB Engineering Ltd.**Bristol, United Kingdom*

- Redesign of the existing Thunderbird CAD drawings using SolidWorks. Delivered a more modular system design.
- Sourcing and procurement of electrical/electronic components.

- Rapid prototyping, overall system architecture design and integration, verification and validation activities and initial formal testing.

Engineering Intern

June 2016

Defence Research and Development Organization (DRDO), Government of India

Chennai, India

- Studied about various control systems of the mine detection, rescue and surveillance based unmanned ground vehicles developed at the Autonomous Systems Division, Combat Vehicles Research and Development Establishment.

Intern

Jan. - July 2016

LEMA LABS Pvt. Ltd., Indian Institute of Technology Madras

Chennai, India

- Extensively worked alongside the corporate head in developing and executing several on ground marketing campaigns.
- As a coordinator, I helped them to organize and execute several workshops and seminars as well.

Leadership / Extracurricular

UWE Tamil Society

Sep. 2019 – May 2020

President

Bristol, United Kingdom

- Founding president of the Tamil society, UWE Bristol. Organized four events during my term and the society received the first global cultural exchange fund of £250 from Student's Union.
- The society won the Best New Society Award 2019, 2nd in Best Small Society Award 2019 and I was awarded 2nd in Best Committee Member of the Year 2019 among 113+ societies. As of May 2020, 45+ registered members in the society.

Social Media 

Association of Mechatronics Engineers, SRM Univerity

April 2016 – June 2018

Design Team Member

Kattankulathur, Chennai, India

- Designed the invitation for various events organized by the association and prepared the technical materials required for the workshops being organized.
- Designed a website for the department of mechatronics engineering.
- Hosted and co-organized one day workshop on “Recent trends of mechatronics in machine tool and manufacturing industries”.

Robotics and Artificial Intelligence Foundation (RAAIF)

Feb. 2015 – July 2018

Technical Council Member

Chennai, India

- Organized and coordinated three robotics and AI events across India and handled the database of engineering industries in partnership with. Also I was involved in various promotional activities.
- Developed a robotics curriculum for junior and high school students and Created lesson plans with activities for easy understanding. I was also responsible for reviewing the contents of presentations for various workshops.

Certifications

Get ROS2 Industrial Ready hands-on training

The Construct, Apr. 2023 | Certificate 

NVIDIA DLI Certificate – Getting Started with DeepStream for Video Analytics on Jetson Nano

NVIDIA Deep Learning Institute, Oct. 2021 | Certificate 

NVIDIA DLI Certificate – Getting Started with AI on Jetson Nano | Certificate

NVIDIA Deep Learning Institute, Oct. 2021

Programming for Everybody (Getting Started with Python) | Certificate

University of Michigan(Coursera), Jan. 2021

Embodied Cognition for Human-Robot Interaction | Certificate

Continuing Professional Development (CPD), The Institution of Engineering and Technology, May 2019

3rd SERB Summer School on Robotics | Certificate

Continuing Education Programme, Indian Institute of Technology Delhi, June 2017

Awards and Recognition

Judges' Award for “Tenacity” (SRM ASV), International RoboBoat Competition

AUVSI Foundation and Office of Naval Research, Florida, USA, June 2018

2nd Prize, National Level RoboWars Competition

Vellore Institute of technology, Vellore, India, Sep. 2016

5th Rank National Level (850 teams in total), NIYANTRA 2015 – Student Design contest

National Instruments, Bengaluru, India, Nov. 2015