Akshet Patel

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EDUCATION

- **University College London (UCL)** — London, United Kingdom
  Master of Science (MSc) - Robotics and Computation — *September 2022 - Present*

  Courses: *Introduction to Machine Learning, Virtual Environments, Robotic Systems Engineering, Robotic Control Theory and Systems, Robotic Sensing, Manipulation and Interaction, Robot Vision and Navigation, Machine Vision, Applied Deep Learning*

  Dissertation: *Chemical Source Estimation and Localisation using Active Deep Reinforcement Learning*
  Supervisors: *Dr Zhongguo Li, Prof (Dr) Simon Julier*

- **Manipal University Jaipur** — Jaipur, India
  Bachelor of Technology - Mechatronics Engineering; GPA: 9.76/10 — *July 2018 - July 2022*

  Courses: *Engineering Mathematics (I, II, III, IV), Theory of Machines, Control Systems, Mechatronics System Design, Microprocessors and Microcontrollers, PLC, Industrial Robotics, Robot Path Planning and Control, Artificial Intelligence*

  Dissertation: *TeleSurgery: A Proof of Concept*
  Supervisors: *Assoc Prof Cai Yiyu, Dr Princy Randhawa*

SKILLS SUMMARY

- **Languages**   Python, C++, MATLAB, C#
- **Development Boards** Arduino Uno/Mega, ESP8266, ESP32, Intel Edison, Intel Galileo, Seed Studio Boards, Raspberry Pi
- **Frameworks**   Robot Operating System (ROS), TensorFlow, Keras, PyTorch, NumPy, Matplotlib

EXPERIENCE

- **Smart Power Systems, United Kingdom**
  Control Systems and Software Engineer — *August 2023 - Present*
  - Coding the S7-1200 and ET200SP PLCs
  - Applying Machine Learning on collected Photovoltaic (PV) data for bill and energy usage estimations
  - **Supervisor:** Dr Ian Chilvers

- **NIT Patna, India**
  Robot Operating System (ROS) Intern — *June 2022 - July 2022*
  - Worked with Quad-SDK, a ROS-based full-stack software framework for agile quadrupedal locomotion and explored a suite of visualization and data-processing tools for rapid development.
  - **Supervisors:** Dr Gagan Deep Meena

- **Nanyang Technological University (NTU), Singapore**
  Visiting Student Researcher — *Jan 2022 - June 2022*
  - Developed the Proof of Concept for TeleSurgery using Virtual Reality and Robotics via Robot Operating System (ROS) and deployed it on the Meta Quest Headset.
  - **Supervisors:** Assoc Prof Cai Yiyu, Dr Princy Randhawa

- **National Institute of Oceanography (NIO) - CSIR, India**
  Project Intern — *Dec 2021 - Jan 2022*
  - Developed a Robot Operating System (ROS) package to create the Bathymetric Map of the seabed by the data captured by the Doppler Velocity Log (DVL) sensor.
  - **Supervisors:** Mrs. Nagvekar M Surekha , Sh. Pramod Kumar Maurya, Dr Raja Rout

- **Lakehead University, Canada**
  MITACS Globalink Research Intern 2021 — *June 2021 - Sept 2021*
  - Conducted extensive research on securing the Routing Protocol for Low Power and Lossy Networks using Secure Hash Algorithm (SHA3) and the use cases of the MQTT Protocol under the guidance of my host professor from Lakehead University, Canada.
  - **Supervisors:** Dr Gautam Srivastava

- **InfoSuccess3D, Greece**
  AR/VR Intern — *April 2021 - May 2021*
  - Trained to use Unity3D and C# language to create a 2D game and an AR application, 'AR Virus App Simulator' to visualize the spread of coronavirus in real-time in 3D space and contributed to a research paper on the same.
  - **Supervisor:** Mr Konstantinos Tsaramirsis

Projects

- **Pick and Place using Panda Arm** - Performed pick and place tasks in Gazebo, using MoveIt! to move the robot and Point Cloud Library (PCL) and OpenCV to detect object positions and colours. (March 2023)

- **Integrated Navigation for a Robotic Lawnmower** - Fused data from various sensors to obtain an optimal position, velocity and heading solution. (February 2023)

- **Graph-based Optimisation and SLAM** Implemented a graphical-model-based SLAM system and assessed its properties. (March 2023)

- **KUKA YouBot Simulation** Applied forward kinematics and computed inverse kinematics and Jacobians in Python to detect singularities and perform path planning to compute the shortest path between start and end points. (December 2022)

- **Creating a Bathymetric Map of the Seabed Using DVL Sensor Data** - Created a bathymetric map of the seabed using the data captured by the DVL sensor and create a ROS Package for the same. (January 2022)

- **MedBuddy - The Medicine Delivery Robot** - Devised a smartphone-controlled delivery cart that can be used to deliver medicines to Covid-19 positive patients to reduce its spread among doctors and nurses. (September 2020)

Patent

- Randhawa, P., **Patel, A.**, Pallikonda, R., H C, S. (2022) Low-Cost IoT Enabled Anti-Theft Device for Two-Wheeled Vehicles. 2022/02843. 22: 2022/03/09. 43: 2022/05/25. B60R. Available at: https://iponline.cipc.co.za/

Publications

- Chowdhury, S.R. and **Patel, A.**, 2022. Role of Internet of Things (IoT) in Electronic Waste Management Industrial Internet of Things: Technologies and Research Directions, p.21.

- Randhawa, P., **Patel, A.**, and Dasari, U., 2022, March. A Machine Learning based Approach for Classification of a Person's Actions based on Electromyography (EMG) Signals In 2022 9th International Conference on Computing for Sustainable Global Development (INDIACom) (pp. 802-807). IEEE.

- Tsaramirsis, K., **Patel, A.**, Sharma, P., Reddy, N., Princy, R., Tsaramirsis, G., Pavlopoulou, A., Koçer, Z.A. and Piromalis, D., 2021. Bio-virus spread simulation in real 3D space using augmented reality. Engineered Science, 16, pp.319-330.

- **Patel, A.**, Sharma, P. and Randhawa, P., 2021, September. MedBuddy: The Medicine Delivery Robot In 2021 9th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions)(ICRITO) (pp. 1-4). IEEE.

- **Patel, A.**, Shanmugapriya, D., Srivastava, G. and Lin, J.C.W., 2021. Routing Protocol Security for Low-Power and Lossy Networks in the Internet of Things In Big Data Analytics: 9th International Conference, BDA 2021, Virtual Event, December 15-18, 2021, Proceedings 9 (pp. 133-145). Springer International Publishing.

- Shanmugapriya, D., **Patel, A.**, Srivastava, G. and Lin, J.C.W., 2021. MQTT protocol use cases in the Internet of Things In Big Data Analytics: 9th International Conference, BDA 2021, Virtual Event, December 15-18, 2021, Proceedings 9 (pp. 146-162). Springer International Publishing.

Honors and Awards

- Awarded Gold Medal for the highest CGPA by the Department of Mechatronics Engineering, Manipal University Jaipur - November 2022

- Awarded the 'President's Gold Medal for Excellence in Research' by Dr G.K Prabhu, President, Manipal University Jaipur - November 2022

- Awarded the Scholarship for Students of Higher Semester by Manipal University Jaipur (2019-2020), (2018-2019)

Volunteer Experience

- President, ISA MUJ Chapter - Led a team of 14 visionaries and conducted online and offline technical & soft-skills development events for a total of over 1000 students. (April 2021 - April 2022)

- Student Mentor at Institute of Engineers India Mechatronics Student Chapter - Mentored on IoT and Basics of Arduino Programming. (February 2021 – May 2021)

- Graphic Design Team, Manipal University Jaipur - Part of the Graphic Designing Team at Manipal University Jaipur for the Oneiros (Cultural Fest) and Blood Donation Camp. (September 2018 - September 2019)