Akshet Patel

Email: akshetp.ap@gmail.com
Mobile: +44-07570321537
LinkedIn: Akshet Patel
Portfolio: akshetpatel.tech
Google Scholar: Akshet Patel
Github: github.com/AkshetP

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, 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), Principles of Programming Languages, Artificial Intelligence, Embedded System Design, Programming in C, Introduction to Cybersecurity*

  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, ESP8266, ESP32, Intel Edison, Intel Galileo, Seed Studio Shields, Raspberry Pi
- **Machine Learning Frameworks** - TensorFlow, Keras, PyTorch, NumPy, Matplotlib, Seaborn, Plotly, Active Deep Reinforcement Learning
- **Cloud Computing** - Amazon AWS, Google Cloud Platform, IBM Cloud
- **Soft Skills** - Leadership, Strong Work Ethic, Disciplined, Time Management, Writing, Public Speaking

Projects

- **Graph-based Optimisation and SLAM** Implemented a graphical-model-based SLAM system and assessed its properties. (March 2023)
- **Integrated Navigation for a Robotic Lawnmower** - Fused data from various sensors to obtain an optimal position, velocity and heading solution. (February 2023)
- **Machine Vision: Homographies and Particle Filters** - Achieved precise image mapping and tracking through the application of Homographies and Particle Filters, demonstrating proficiency in image transformation, object localization, and tracking accuracy assessment. (January 2023)
- **Machine Learning Algorithms Math and Implementation from Scratch** - Developed and implemented various machine learning algorithms from scratch, including regression models, classification algorithms, support vector machines, and clustering techniques such as k-means and principal component analysis (PCA). (December 2022)
- **Mixtures of Gaussians for Image Segmentation: Pixel Detection and Classification** - Achieved successful application of Mixtures of Gaussians algorithm for precise apple pixel segmentation and performance evaluation using posterior probabilities and threshold-based Receiver Operating Characteristic curve (ROC) analysis. (November 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)
- **Analysis of Spotify Music Taste Change During Lockdown** - Analysed streaming data from Spotify to uncover changes in music preferences during the lockdown period, including the discovery of new artists, shifts in top tracks and artists, and visualize the findings to gain insights into personal music listening habits and trends. (September 2020)

Publications

- 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.
- **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.

Experience

- **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.
  - **Tech Stack:** Reinforcement Learning, Python, C++, ROS.
  - **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.
  - **Tech Stack:** Unity 3D Game Engine, Python, C#, C++, ROS, Niryo One Robotic Arm, Meta Quest
  - **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.
  - **Tech Stack:** Data Plotting and Preprocessing, MATLAB, Python, C++, ROS.
  - **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.
  - **Tech Stack:** Cooja Simulator, Amazon Web Services, C
  - **Supervisors:** Dr Gautam Srivastava
- **Widhya, India**
  Machine Learning Engineering Intern *Jan 2021 - Feb 2021*
  - Achieved excellent accuracy in the following projects - Instagram Post Reach Prediction, Flight Delay Prediction, and Covid-19 Analysis.
  - **Tech Stack:** Python, Linear Regression, Decision Trees
  - **Supervisor:** Team Widhya

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/

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)
- Invited for Delivering Talks/Sessions/Workshops by 12+ Organisations/Universities/Student Clubs in India. (2021- Present)

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)