Pranav Kedia

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Education

- **International Institute of Information Technology Bangalore (IIIT Bangalore)** — Bangalore, India
  Integrated Masters in Electronics and Communication; Overall GPA: 3.3/4, Master's GPA: 3.83/4 — *Aug 2015 - May 2020*
  Courses: Multi-Agent Systems, Intro to Robotics, Control Theory, Machine Learning, Real Time OS, Probability and Statistics ,and Microprocessors and Microcontrollers.
- **Modern Vidya Niketan Sr. Sec. School** — Faridabad, India
  All India Senior School Certificate Examination ; Percentage: 91.4% — *Apr 2013 - Mar 2015*
- **Modern School** — Faridabad, India
  All India Secondary School Examination; CGPA: 10.0/10.0 % (Second in class of 180) — *Apr 2000 - Mar 2013*

Publications

- **Design and development of an autonomous in-seat passenger state identification in a modern vigilance enabled public transportation system**: Co-Authored with: Pranav Aggarwal and Dr. Madhav Rao, 2019 IEEE International Conference on Vehicular Electronics and Safety (ICVES'2019), DOI: 10.1109/ICVES.2019.8906349
- **Crime Mapping and Analysis using GIS: An Indian Perspective**: Co-Authored with: Dr. Hanif Qureshi and Aman Yadav, preprint DOI: 10.13140/RG.2.2.11064.14081

Work Experience

- **Indian Institute of Technology, Bombay** — Mumbai, India
  Research Intern - Prof. Arpita Sinha — *May 2019 - Jul 2019*
  - **Shape Formation with Kilobots**: I worked at the A.R.M.S. Lab at Department of Systems and Control Engineering. I worked on shape formation in swarm collective of Kilobot robots.
  - **Simulation of Kilobots using V-REP and NetLogo**: Tested additive and subtractive shape formation algorithms for Kilobots in a V-REP scene and Netlogo simulation.
  - **Simulation of Mobile Inspection in V-REP**: Worked on simulation of structure inspection using novel path planning strategies on a KUKA YouBot in V-REP
- **Haryana Police Department** — Haryana, India
  Research Intern - Dr. Hanif Qureshi, PhD (Commissioner of Police) — *Jun 2016 - Jul 2016*
  - **Geographic Information System (GIS) for crime analysis**: My work at the Commissioner Office was looking over the available infrastructure and developing low-cost crime mapping and analysis software solution for the Law enforcement agency.

Teaching Experience

- **Teaching Assistant - VL853 Advanced ARM Architectures** — Bangalore, India
  IIIT Bangalore — *Fall 2019*

Research Experience

- **Surgical and Assistive Robotics Lab @ IIIT Bangalore** — Bangalore, India
  Graduate Researcher - Prof. Madhav Rao — *Jan 2019 - Till Date*
  - **Multi-agent systems**: Investigation in foraging techniques of ants (pheromone based) and other insects; development and circuit design of an environmental platform inspired from cellular automata.
  - **Passenger safety in public vehicles**: Researching contact and contact less passenger emotion and state identification and classification techniques using Galvanic skin response, pressure response etc, EQ-Radio etc
- **A.R.M.S. Lab @ Indian Institute of Technology, Bombay** — Mumbai, India
  Research Intern - Prof. Arpita Sinha — *May 2019 - Jul 2019*
  - **Shape Formation with Kilobots**: Investigations in additive and subtractive shape formation algorithms for a swarm of 40 Kilobots. Experiments were carried out in V-REP simulator as well.
- **High Density Electronic Systems Lab @ IIIT Bangalore** — Bangalore, India
  Undergraduate Researcher - Prof. Madhav Rao — *Jun 2017 - Dec 2018*
  - **Beowulf Cluster**: Distributed computing applications of Beowulf cluster of Raspberry pi using Message Passing Interface to estimate timing data with various no. of nodes and networking bottlenecks.
  - **Wearables**: Developed a hand based controller for various peripherals like mouse and keyboard through hand gesture and movement with applications in fields of VR and to help disabled people to communicate with others and is an easy interface to technology.

Academic Projects

- **An Experimental Distributed Swarm Robotics Platform** : Investigations into the working of swarms in nature (eg: army ants, weaver ants, school of fishes and even cells in a multicellular organism). Designing and developing bio-inspired Swarm robotics platform artificially imitating these natural processes of communication and coordination among group of robots.
  (Guide: Prof. Madhav Rao, Aug'18 - Till Date)
- **Design and development of an autonomous emergency vigilance system for passenger vehicle** : An automotive enabled integrated sensory system is designed to identify physical discomfort of the passenger travelling in the public transportation system. The sensory system is designed to connect with the emergency response team for any immediate action.
  (Guide: Prof. Madhav Rao, Jan'18 - Till Date)
- **Ultrasound based Occupancy Detection Sensor for Smart Buildings**: A network of real time ultrasound based smart door person occupancy detector was designed and developed to identify and monitor human movement through a door with applications in big public buildings with large footfall.
  (Guide: Prof. Jyotsna Bapat, Jan'19 - May'19)
- **A 4 DOF and 2 DOF planar manipulator using LEGO® MINDSTORMS® EV3 with EV3Dev distro**: Designed a easily replicable 4 DOF and 2 DOF planar manipulator for testing various trajectory planning algorithms using LEGO® MINDSTORMS® EV3 with EV3Dev distro for better actuator and sensor data access.
  (Guide: Prof. Sachit Rao, Jan'19 - April'19)
- **Design and Development of an Automated Solar Tiller**: Designed and developed an autonomous solar powered field tiller using image processing and magnetic encoders to solve simultaneous localization and mapping(SLAM) problem. More Info: https://goo.gl/brkM9U
  (Guide: Prof. Madhav Rao and Prof. Chetan Parikh, Jun'17 - May'18)
- **C.M.O.W.C (Cross Platform, Multi Utility, On board, Wearable, Controller)**: Developed a hand based controller for various peripherals like mouse and keyboard through hand gesture and movement with applications in fields of VR and to help disabled people to communicate with others and is an easy interface to technology. More Info:https://goo.gl/YrJeaL
  (Nov'16 - Feb'17)

Skills Summary

- **Languages**: C, C++, Python, Linux scripting, Assembly(ARM), Java(Familiar)
- **Software Tools**: Git, Matlab, Octave, ROS (Robot Operating System), OpenCV, freeRTOS, KEIL, GNU Octave, GNU Make, Open MPI, Vim
- **Design Software Tools**: Fusion360, Inkscape, Solidworks(basic), KICAD, Autodesk Eagle
- **Simulation Tools**: Gazebo, V-REP, Netlogo, LTspice, Multisim
- **Embedded Development Platforms**: ARM Cortex M4, STM32F4, MSP432, Raspberry Pi, BeagleBone Black, ATmega328, and Arduino
- **Miscellaneous**: CAD, 3D Printing(Creality, Ultimaker, and Makerbot)

Honors, Awards and Achievements

- Selected for **Huawei Merit Scholarship** from Huawei twice for the year 2016 and 2017
- Selected for the prestigious **Bristol Leadership Programme** 2019
- Top 1% in All India Secondary School Examination (A.I.S.S.E.)
- Honourable Mention at Intel IOT hackathon 2016
- Honourable Mention at ACM ICPC Regional at Amritapuri and Chennai 2015
- Top 10 teams in the country in Zeiss Hackathon 2018
- Selected for Haryana State Talent Search Scholarship from the Government of Haryana
- Top 0.01% in Science, Maths and Computer Olympiads in India
- **Co-founder**, Project Advisor and Deputy Head of Enigma (IIIT Bangalore Student Robotics Club)

References

Madhav Rao, Associate Professor, iM.Tech Coordinator and Faculty in-charge-Labs
IIIT Bangalore
mr@iiitb.ac.in

Jyotsna Bapat, Professor and Dean (Faculty)
IIIT Bangalore
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Sachit Rao, Assistant Professor
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