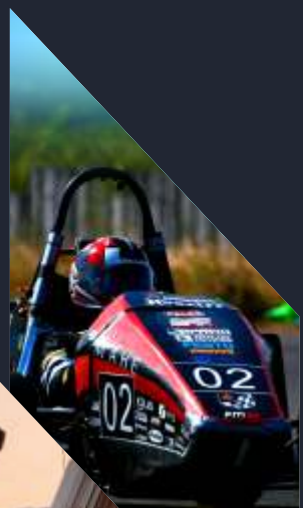
MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)



TECHSHILA

Students' Major Project Teams

Manipal Institute of Technology, Manipal

CAMPUS OF EXPERIENTIAL LEARNING

Director's Message

Commander Dr. Anil Rana
Director, MIT

MIT experience goes beyond the periodic system of lectures, tutorials and assignments. We believe in imparting education which is holistic, nurturing and experiential. MIT produces world class technocrats and engineers but we also want to create community change agents and believers, who will ensure that a way forward for humanity is through progress, kindness, shared interests and most of all, by accepting diversities of people.

Club and project activities in MIT has its major perks and satisfaction for students. Through participation and collaboration with diverse group of people, our students are enabled to develop new skills which includes communication, leadership, team work, time and resource management skills. It helps them to manage time and resources effectively, make pragmatic decisions and coordinate major events. These group activities provide functional skills that help students to rediscover their inner potential. It allows the students a learning to work with people, to manage conflicts and in finding solutions through team work and camaraderie. It helps students to make new connections and bonds, far away from their families.

This coffee table book has compiled some unbelievable accomplishments of our students achieved through sheer hard work, dedication, perseverance and above all a "can do" spirit that is the hall mark of education quality in the "mighty-mighty MIT". Behind every project is a story of sweat and toil, of successes and multiple failures, of desperation and hope, of sorrow and cheers and of deep-routed friendship built through shared labour. I wish all the projects of MIT a very successful year ahead and want all the readers to find time to visit the factories of the champions of MIT-Manipal – a hub of experiential learning.

Joint Director's Message

Dr. Somashekara Bhat
Joint Director, MIT

Engineering education is expected to be experiential. This could be carried out as a classroom activity by incorporating relevant modules in the curriculum, or as an outside the classroom activity. MIT is known to do this effectively in both the modes, thus, is identified as campus of experiential learning. More than 80 technical and cultural clubs provide these opportunities for learning outside the classroom. Prominent among the technical clubs are the 'Major Student Projects' - the student teams working on some theme based technical problems.

It all started in the year 2007 with a bunch of students approaching the administration to provide them support to conceptualize, design, fabricate, test and race a single seater, open-wheel Formula-style race car. The group identified themselves as 'Formula Manipal'. Since its first competition in 2008, the team has brought in lot of laurels to self and to the Institute. With this humble beginning, the campus now houses about 22 major project teams with each team having members ranging from 25 to 75. These passion driven team activities hone their communication skills, build team spirit and healthy relationship, skill them in identifying a problem, extract engineering specifications and provide an optimal solution, make them good planners, adaptable, and flexible, with all these skillset groom them to be potential leaders.

Update about most of these campus activity are available in the various forms such as respective team's website, Institute booklet – Prospectus, Institute newsletter – Focus, Annual Magazine - MIT Ingenuity etc. However, there was always a feeling that these activities should be brought out in the form of a coffee table book, for someone to enjoy the morning coffee or free time by going through it and appreciating the intellectual power of young minds. The book you are holding is the outcome of such a thought process.

If you are a parent of a child, I am sure you would like to see the achievement of your child reflecting in this book; if you are an entrepreneur or a corporate leader, you would like to have such a skilled manpower in your team; if you are an investor, you may wish to support any of these teams to come up with a startup or a product; if you are supplier of equipment, software tools or consumables, you may wish to support these teams. Altogether, we wish this initiative of ours will connect all the stakeholders and create a positive vibe among all.

Happy reading...

Students' Major Projects - A Manipal Model for Experiential Learning

With easy access to resources, today's children have ability for self-learning. They look for learning to be fun, hands-on, and experiential. Also, an engineering graduate is expected to have skill set to find solutions to problems of the society. Along with the domain specific knowledge, an engineer needs skills such as: Communication, Leadership, Teamwork, Problem Solving, Planning, Motivation & Enthusiasm, Adaptability &Flexibility, and Ability to Build Relationships. With highly competitive market, human resource has become a critical resource. Corporates are looking at this resource to start contributing from day one. With knowledge-based economy, today's engineers are expected to demonstrate their ability for lifelong learning. All these mandates engineering education to be experiential, practical, relevant, and up to date.

In India, entry into engineering Institutions is highly competitive. With this, students have built-in competitive spirit. To foster this spirit, in 2007, Institute came up with the idea of 'Major Student Projects', wherein, institute provided infrastructure to build a technical project to compete in an international competition. Such an initiative was 'Formula Manipal', a student engineering project comprising of a group of undergraduate students aiming to conceptualize, design, fabricate, test and race a single seater, open-wheel Formula-style race car. Since its first competition in 2008, the team has participated in competitions in Italy, UK, Austria, Germany, and the Czech Republic.

The success of this has led to initiation of many more student teams. The year 2008 saw the start of 'Team Manipal Racing', off road racing club to design and fabricate All-Terrain Vehicles according to the rules laid by SAE BAJA. Year 2009, AeroMIT was initiated to design, manufacture, and fly a complex, stable, and portable model aircrafl with minimal empty weight, maximum payload carrying capacity; RoboManipal was started with an aim of taking part in robotics competitions like Robocon. Parikshit Student Satellite Team started in 2010 aims to build nanosatellites. Year 2011 was the beginning of 'Solar Mobil' with an aim of research & development of solar powered electric vehicle. Project Manas, aiming to develop an 'autonomous drive system for vehicles' optimized for Indian road and traffic conditions; Mars Rover Manipal, with a primary objective of building a Rover for University Rover Challenge was established in the year 2014.

Thrust MIT - working in the field of rocketry; R.U.G.V.E.D Systems - A.I. Defense Robotics team; Dronaid to provide engineering solutions to medical field using Drones; MotoManipal– building environment-friendly Electric Superbike; VISION - engaged in developing AR based applications; S.W.A.R.M - working towards development of Smart Wireless Autonomous Robots; Robotics and Circuits focused towards research and development in the field of robotics; Team Combat Robotics - working on combat robotics; Project AUV working on underwater robotics; Cryptonite - team of cyber security enthusiasts; loopMIT - active on SpaceX Hyperloop, and Manipal BioMachines - working on synthetic Biology are the recent additions to this list.

All these teams are interdisciplinary in nature, having student representation from first to final year. In the process of getting into the team, and selecting the members to the team, students learn to face and conduct interviews. With the team size ranging from 25 to 50, students learn to work in group. By working under tight schedules, they learn to meet deadlines. By submitting Quarterly progress report, scheduling the task and by presenting budget required for the financial year, they hone their documentation, planning and presentation, skills. To generate the financial support, they need to sell their idea to possible sponsors. In the process, they learn the marketing, budgeting, and accounting skills. Thus, with this activity, we have taken the learning experience beyond the classroom.

Projects being innovative in nature, these activities have seen many publications and start-ups coming out of these ventures. Institution also envisages more scope for publication and IPs. To enable this, teams have added a research wing.

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Formula Manipal

Formula Manipal Team, 2021-22

Formula Manipal, established in 2007, is the official Formula Student Team of Manipal Institute of Technology, MAHE, Manipal. The Team is engaged in designing & building of Formula Style race cars of the combustion & electric categories and participation in events held in India & abroad.

- The Team has participated in Formula Student competitions held across the world in countries like Austria, Italy, UK, Czech, Germany and Formula Bharath in India and won many accolades, over the years.
- Credited with 8 Journal & 2 conference publications, so far.
- Filed for 2 Patents, so far.
- The combustion team participated in Formula Student Germany (FSG) event during 15th - 22nd of August, 2022 and stood 19th overall rank amongst 26 teams. Team is currently engaged in preparations for Formula Bharat 2023 & FSG 2023.

Dr. Ranjan Pai (CEO & MD, MEMG) getting firsthand experience of FMX4 (2014)

Team Members assembling the Car

FMX (2010) The Lightest Indian FSAE Car and the Most Motivated Team at Formula Student Austria

FM09 (2019) - Stood 10th in the Cost Event held at Formula Student UK

FM08 (2008) The First Formula Student Car manufactured by Formula Manipal

FMXI (2011) – Bagged 16th Position in the Cost Static Event at Formula Student Italy

FMX3 (2013) – Fastest Indian FSAE Car and the only Indian Team to achieve a podium finish at Formula Student Germany

FMX6 (2016) – Best Indian Team at Formula Student Czech that stood 16th Overall

FMX4 (2014) – Holds the existing National Acceleration Record of 4.19s

FMX8 (2018) - Overall Podium finish in Formula Bharat along with 1st position in Business Plan

FMX6 2.0 (2017) - The First Formula Manipal car to implement a fully functioning Aero-Package

Formula Manipal Team at Formula Student Germany (FSG) 2022 event

Few but not the last of our Accolades and Achievements

FM20 (2020) - Topped the Autocross event with the best time of 92.24 seconds achieving First Position

Formula Manipal Team, 2022-23:

1. Aniruddh Ande (Team Manager)

2. Samar Jakhar (Team Leader – Combustion Vehicle)

3. Arya Bobade (Team Leader – Electric Vehicle)

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https://www.youtube.com/user/formulamanipal96
https://twitter.com/formulamanipal?lang=en

SolarMobil Team

SolarMobil Team, 2021 - 22

SolarMobil founded in 2011, is the official Solar Car team of Manipal Institute of Technology, MAHE, Manipal, which is a team of passionate individuals who focus on the research and development of solar powered electric vehicles.

- Team has built 4 solar powered cars namely, Freyr-1, SERVe, SM-S1 and SM-S2 and participated in many events and won accolades.
- It has published 2 papers in reputed journals and 5 papers in conferences, so far.
- Current team has built the Chassis & composite exterior body in their industrial partner, NTF Ltd., Gurgaon and preparing for Electric Solar Vehicle Championship (ESVC) conducted by the Imperial Society of Innovative Engineers, during 2023, in the rally spanning over 1,000 kms. from Greater Noida to Lucknow.

Team members posing with SERVE

SERVE - India's first Institutional Solar electric vehicle prototype, which won 3rd Prize at CII India Innovation Challenge, QuESTIngenium 2015 and 1st prize under category UJJWAL in IIT- Bombay Tech fest

SM-S1

Welding with Fronius TIG Welding machine

Team member welding the autonomous prototype chassis

Dr. Ranjan Pai (CEO & MD, MEMG) on a ride in SERVE

Chassis of SM-S2 which featured at the Champions of Champions 2019, Vijayawada and Future Mobility Show 2019, Bangalore by ISIE

SERVE Launch Day

Launch of SM-S1, which won ASME SLDC 2016 and 3rd place in Anveshan 2017

Members celebrating the completion of Chassis.

Solar Mobil Team, 2022 – 23:

1. Yash Avinash Sonsale (Team Leader)

2. M Aryaa Yadaw (Team Manager)

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Project Manas

The team Project MANAS 2021-22, working diligently, bringing Bits to Life.

Project MANAS, established in 2014, is the official AI and Robotics team of Manipal Institute of Technology, MAHE, Manipal.

- One among the top 13 teams selected for the “Driverless Car Challenge” as a part of Mahindra's Spark the Rise event.
- Grand prize winner and won the Lescoe Cup at Intelligent Ground Vehicle Challenge (IGVC) 2019, held in Michigan, USA.
- Team has 1 journal and 14 conference publications to its credit, so far.
- Filed for 1 Patent, so far.
- The team participated in the event, AUVSI SUAS - 2022 (Association for Unmanned Vehicle Systems International Student Unmanned Aerial Systems – 2022) held at St. Mary's, Maryland, USA, during 15th -18th June 2022 and stood 18th position amongst 71 teams. Team is currently working on the development of autonomous electric car eve & preparing for SUAS 2023 & IGVC 2023 events.

Our subscale drone Cleo for the competition AUVSI SUAS 2022

6 feet wide drone for AUVSI SUAS -2022 event

Team Members at AUVSI SUAS -2022 event venue at Maryland

The team working on assembling the frame for the Drone made with Carbon Fiber

Our team at the Manipal Entrepreneurship Summit hosted by E-cell, MIT

Drone Cleo assembled with all the electronics and components installed to test the Algorithms developed by the AI Team

Testing of our main drone which will participate in the AUVSI SUAS 2022

The team along with UG Solo in Michigan, Oakland after winning IGVC 2019

Autonomous Car Eve which is packed with cutting-edge technologies and efficient Algorithms.

Team members talking to the Representatives of UGC, showcasing their projects.

Team working on our very own in-house Antenna Tracker

UGV Solo which won the Lescoe Cup at Intelligent Ground Vehicle Competition 2019

Project Manas Team, 2022 – 23:
1. Deep Gupta (Team Manager)
2. Nilabha Das (Technical Head)
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https://twitter.com/projectmanas

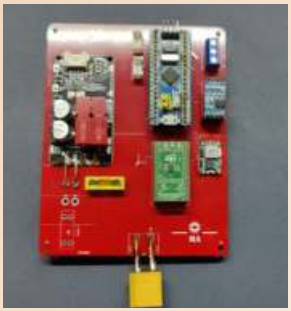
Mars Rover Manipal

Mars Rover Manipal Team, 2021 – 22

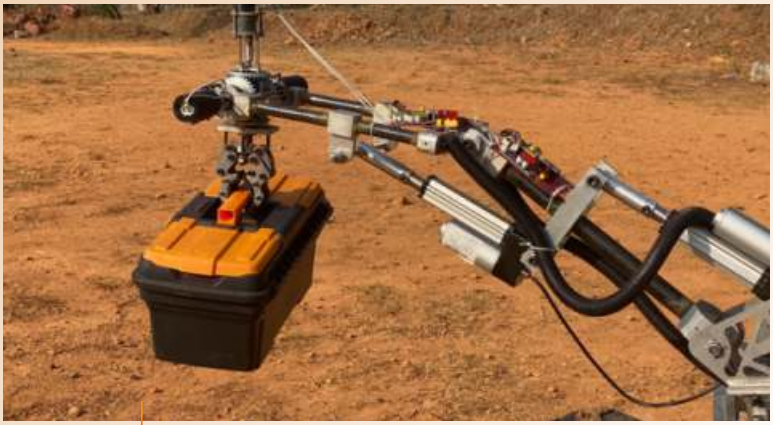
Mars Rover Manipal (MRM), established in 2014, is a multi-disciplinary team of engineering undergraduate students of Manipal Institute of Technology, MAHE, Manipal, working on building a next generation Mars Rover that will work alongside humans and assist astronauts in Mars exploration.

- Participated in the University Rover Challenge (URC), International Rover Challenge (IRC), Indian Rover Design Challenge (IRDC) over the years and won laurels to the institute.
- Team has 16 Conference Publications to its credit, so far.
- Filed for 1 patent, so far.
- The team participated in the event University Rover Challenge 2022 at Mars Desert Research Station, Hanksville, Utah, USA during 1st to 4th, June, 2022 and the team ranked 21st out of 36 teams. Team achieved 2nd rank out of 24 teams participated in the European Rover Challenge -2022 remote event held during 9-11, September 2022.
- Team is currently engaged in the preparations for International Rover Design Challenge 2022, International Rover Challenge 2023 & University Rover Challenge 2023 events.

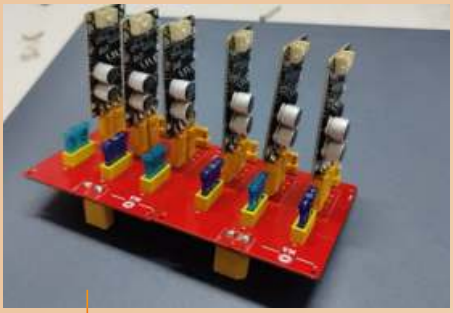
An Isometric Still of Rover at testing grounds



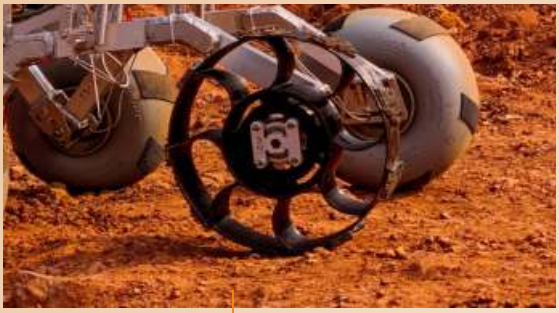
STM&IMU integrated PCB for robotic manipulator



The Robotic Manipulator is capable of lifting payload up to 6kg

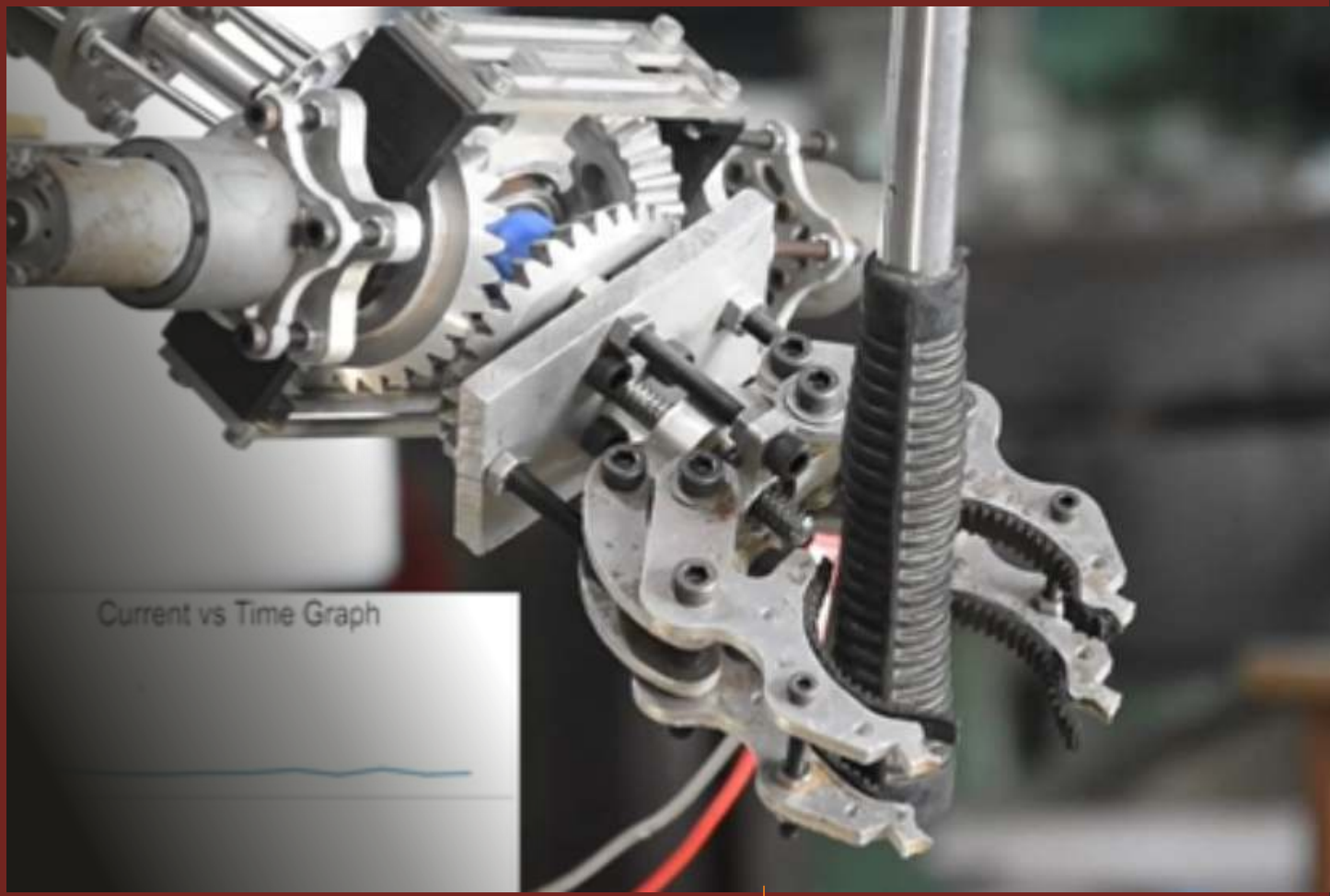


Stack Modular Motor Driver PCB



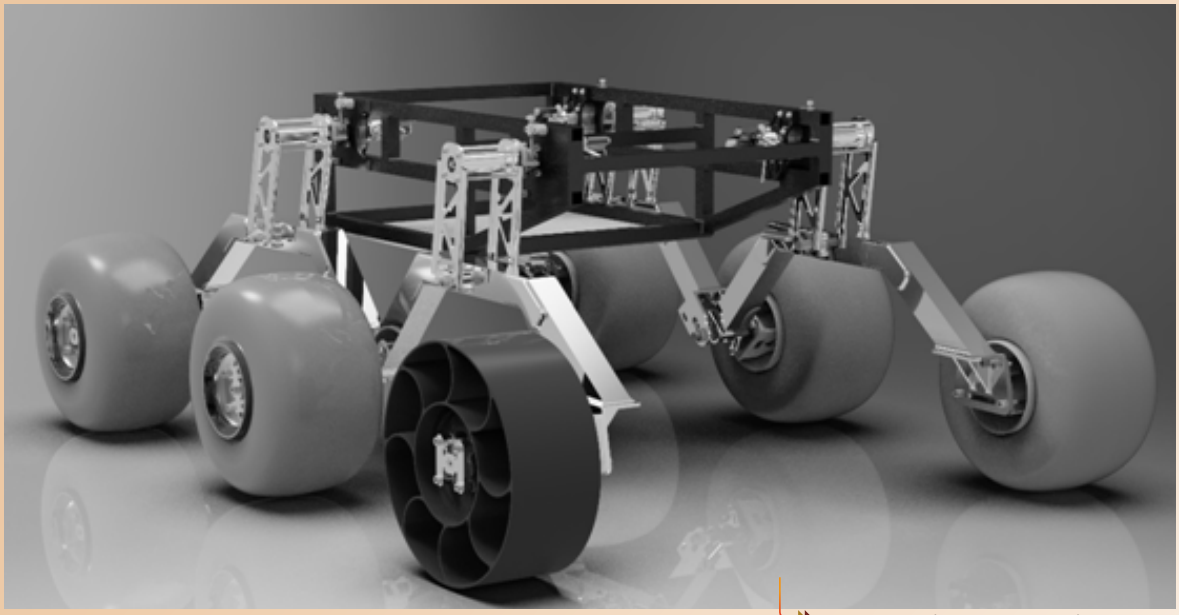
A physical 3-D Printed Wheel mounted on the rover.

MRM demonstrating their first prototype Rover in their workshop during 2015



A Lead Screw Based gripper enabling power grip

A bevel differential powered End Effector



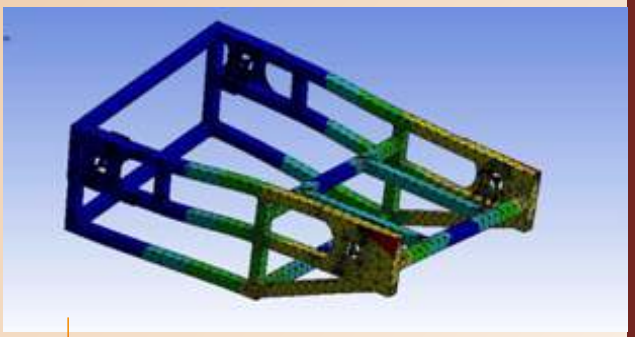
A rendered image of the drive system

LIDAR and Zed for autonomous navigation

Drive System for the year 2022

Team members at URC – 2022 venue at Utah, USA

Team participated in European Rover Challenge (ERC) – 2022 event



A detailed load analysis and simulation of the chassis

Mars Rover Manipal Team, 2022 – 23:

1. Yashash Rao P (Team Leader)
2. Akhilesh Jhawar (Team Manager)

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https://instagram.com/marsrovermanipal?igshid=1ln2cwnqm683a

https://www.youtube.com/c/MarsRoverManipal

Robo Manipal

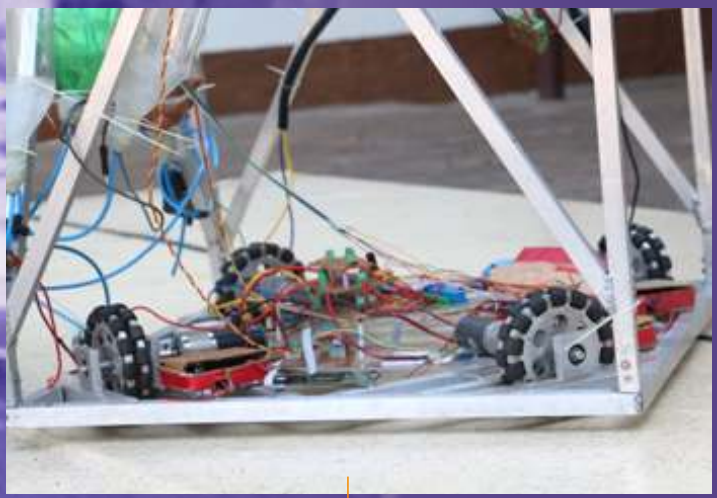
Team RoboManipal of 2019

RoboManipal, founded in 2009, is the official robotics team of Manipal Institute of Technology, MAHE, Manipal. The team is working on research projects, 12 DOF Quadruped, 6 DOF Serial Manipulator and BIPED.

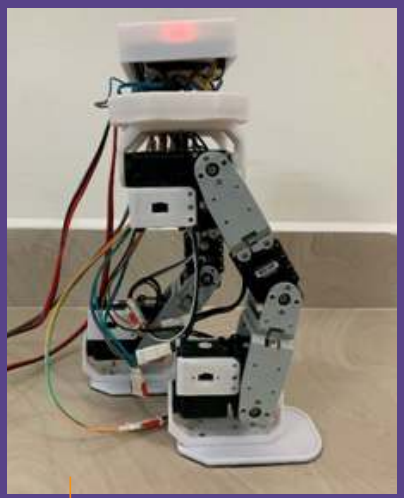
- Achieved AIR 9 ABU Robocon, Asia pacific's biggest robotics competition in 2016.
- Secured 2nd place in the World Robot Olympiad(WRO) 2018.
- Qualified for Stage 2 of ABU Robocon for the last 3 years.
- Team bagged Ist place in Vichesta- the ROS simulation competition category under Takshak2021 (organized by RoboISM- IIT ISM Dhanbad), the largest Robotics Fest of India.
- Published 4 papers in the conferences, so far.
- The team is currently preparing for Robocon 2023, Techfest 2022 and Technoxian 2023 events.

Rapid Prototype through soldering by an electronics subsystem member

Testing a prototype robot for ABU Robocon 2020



Robot used in ABU Robocon, 2015



A Biped designed and built by a RoboManipal member as a research project.

The team collecting runner's up trophy
at World Robotics Olympiad India (WRO), 2018

Robots in action at Robowars, an event of
TechTatva which is organised by RoboManipal

Runner's up at
World Robotics Olympiad, 2018

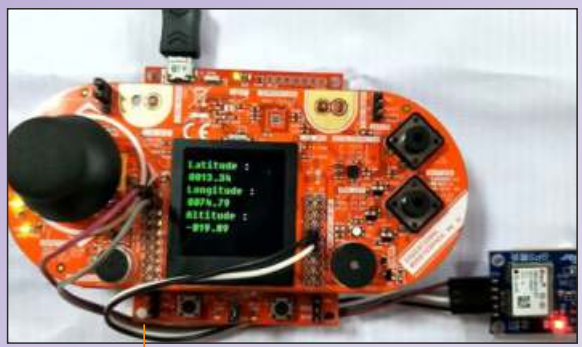
Team RoboManipal all set to participate in finals of ABU Robocon 2015

Robot used during ABU Robocon, 2016

Robot used during ABU Robocon, 2018

RoboManipal team preparing robot for ABU Robocon 2016

Arena for ABU Robocon, 2016



The printed circuit board of a controller which was built in-house at RoboManipal.

Robot prototyping design & manufacturing by Mechanical Team

RoboManipal Team, 2022 – 23:

1. Sakshi Naik (Team Leader)

2. Shobhit Malpani (Team Manager)

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Moto Manipal

MotoManipal Team, 2022-23

MotoManipal, founded in 2018, is a team of Manipal Institute of Technology, MAHE, Manipal, engaged in developing an efficient and environment-friendly Electric Super bike.

- Team participated in Asian E-Bike Challenge 2019, FMAE National Online E-Bike Design Competition 2020, 2021, 2022 and won laurels.
- Secured three consecutive podium finishes at the National Online E-Bike Design Challenge (NOEBDC).
- The team is credited with 3 conference publications, so far.
- Involved in research on the following topics:
  - o A comprehensive design methodology for electric vertical take-off and landing aircrafts.
  - o Performance of Battery Super capacitor Hybrid electric bike.
  - o Analysis and Optimization of winglet Design for high performance motorcycles.
- Currently engaged in making the bike ready for participation in Moto Student International competition to be held at Aragon, Spain in 2023.

Competing at the Asian E-Bike Challenge 2019 in Vishakhapatnam

MotoManipal Senior Team, 2021-22

Unveiling of E bike, 2019

E-Powertrain Subsystem of the e-bike

Raspberry Pi being used as the dashboard for display of RPM & Battery Management System Data

Modelling & Computational Fluid Dynamics (CFD) Analysis of the E Bike

Budget discussion by the Team Members

Art and Graphics work for publicity through social media

Honing the skill with an Angle Grinder

Tyre Alignment of the E-Bike

MotoManipalTeam, 2022- 23:

1. **Jishnu Kunal Vutukuru (Team Leader)**
2. **Sai Adithya Pavan Jayanthi (Team Manager)**
3. **Pranav Lakshmanan (Technical Head)**

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://www.instagram.com/motomanipal/

Team Manipal Racing

Team Manipal Racing (Electric) Members, 2021-22

Team Manipal Racing, established in 2008, is the official Off-road racing team of Manipal Institute of Technology, MAHE, Manipal. The Team is involved in the design, manufacture & testing of an ATV (all-terrain vehicle) to participate in collegiate competitions organized by institutions like SAE.

- Team's V1 was the first Indian ATV to qualify for the competition in SAE BAJA held in Wisconsin USA in 2011.
- Team Manipal Racing's V10 officially ended its twelfth season bagging achievements at BAJA SAE India NATRAX, Pithampur, MP in Jan 2020 where the team secured 25th in overall statics, 6th in acceleration, 11th in business presentation.
- Has 2 journal publications to its credit, so far.
- Filed for 1 Patent, so far.
- The combustion team participated in the m -BAJA event organized by SAE India, during 5th – 10th April, 2022 at NATRAX, Pithampur, Indore, Madhya Pradesh and stood 12th overall rank amongst 81 teams.
- The electric team participated in thee - BAJA event organized by SAE India, during 1st - 5th June, 2022at NATRAX, Pithampur, Indore, Madhya Pradesh and stood 5th overall rank amongst 75 teams.
- Team Manipal Racing - Electric has been chosen as Brand Ambassador for BAJA 2023 event, by SAE India.
- Both combustion & electric teams are currently engaged in developing the ATV for BAJA 2023 event.

Presenting our award-winning ATV car, V5 to the VIPs

ATV of the Year 2018 - 19

Combustion ATV of 2016 - 17

ATV of the Team during 2017 - 18

Team Members at the venue of BAJA SAEINDIA 2020

Team 2019 - 20

Team Manipal Racing – Compustion members
at m – BAJA 2022 venue, Pithampur, Madhya Pradesh

Team Manipal Racing – Electric members
at e - BAJA 2022 venue, Pithampur, Madhya Pradesh

Team Manipal Racing Team, 2022 – 23:

1. Anadi Kapoor (Team Captain – Combustion ATV)
2. Aryaman Bhatnagar (Team Captain – Electric ATV)

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https://www.youtube.com/user/TMRBAJA

AeroMIT

AeroMIT Team of season 2021 - 22

AeroMIT founded in 2009, is the official Aeromodelling and Autonomous Aerial Robotics Team of Manipal Institute of Technology, MAHE, Manipal. They design and fabricate UAVs for various research and competitive applications.

- Achieved World Rank 4 in the SAE International's SAE Aero Design East, 2020 and1st position in the Technical Presentation category.
- Achieved 1st position in the Application Report in SAEINDIA's SAEISS Aero Design Competition, 2021.
- The team participated in SAE Aero Design West 2022 during April 8-10, 2022 at Apollo XI RC Flying Field, Van Nuys, California, USA and stood 1st in the Design Report, 2nd in the Oral Presentation in the virtual event, 2nd in the Mission Performance in the physical event and was awarded for being the only team with the fastest 100-meter sprint leading to an overall achievement of World Rank 2 out of 13 teams participated in the micro class category.
- Team is currently engaged in the preparations for SAE Aero Design East 2023 event.

Team members at work

Team members configuring parameters for an autonomous aircraft.

Juniors' Task Phase fixed wing aircraft

During Techtatva, hosting our very own aeromodelling competition – Skyrush

Members working on the aircrafts

The team with the autonomous Hexacopter

Flight testing of Drone by the team

Team AeroMIT at SAE International's SAE Aero Design East, 2020

Team AeroMIT at SAE International's SAE Aero Design 2022 West at California

AeroMIT Team, 2022 – 23:

1. Akhil Mhatre (Team Leader)

2. Dhruva Raj Lakshmikantha (Team Manager)

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Faculty Advisor:

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Parikshit

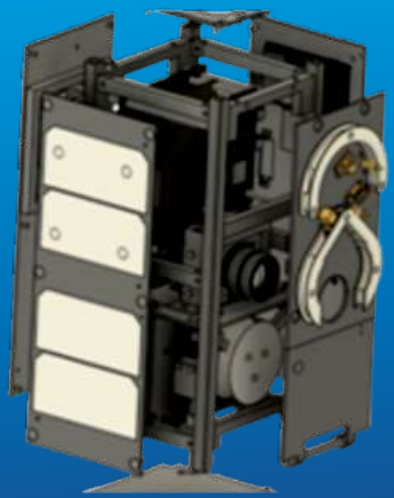
Parikshit Satellite Team 21-22

Parikshit Student Satellite Team was formed in 2010 with 40 student members from across the departments of Manipal Institute of Technology, MAHE, Manipal, engaged in developing a student satellite. Their aim is to explore the fields of space science and work on experiments that could be performed in space.

- Parikshit's satellite has two payloads, a thermal camera which creates images using infrared radiations and an electrodynamic tether which is a ong conducting wire which operates on electromagnetic principles.
- Mr. Adheesh Boratkar, a team member represented the University for testing Parikshit's Tether Deployment System in a zero-gravity parabolic flight at NASA.
- Team has published 52 papers in international conferences, so far.
- The Team is in discussion with IN-SPACEe, regarding MOU for supporting launch and development activities of the flight model of the satellite.

Visit by Saber Astronautics, Australia to Parikshit Lab.

Team member interacting with Saber Astronautics, Australia in the Parikshit Lab.

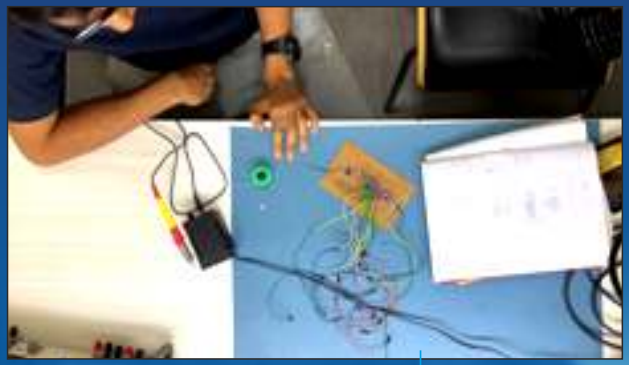


Model of the Satellite being built by the team

Team member experiencing Zero G at NASA

Team members posing with Ms. Sunita Lyn Williams, at NASA

A regular day in the student project lab.



A day at the lab with a subsystem

A still from the clean room

A visit by the esteemed Rakesh Sharma

Setting an Outdoor Antenna

Parikshit Team, 2022 – 23:

1. Shivani S (Team Leader)

2. Shubhakriti Gupta (System Engineer)

3. Tanushka Tarun Choudhary (System Engineer)

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thrustMIT

The Team of 2021-2022

thrustMIT Team, established in 2016, is Asia's top student-run rocketry team in Manipal Institute of Technology, MAHE, Manipal, that builds sounding rockets to promote the passion and knowledge of high-powered rocketry in India.

- Participates in the largest rocketry competition in the world, Spaceport America cup, held at Spaceport, New Mexico every year.
- Team won spot award for the design of the rocket and for the team professionalism during 2018 & 2019 respectively in the 10,000 feet COTS (Commercial Off The Shelf) category in the Spaceport America Cup.
- Team has published 2 papers in the international journals, so far.
- The team participated in Spaceport America Cup 2022 in Las Cruces, New Mexico, USA, during 21st - 25th June, 2022 and achieved 50th overall & 30th in the 10K COTS category, out of 140 teams participated.
- Team is currently engaged in the preparations for Spaceport America Cup – 2023.

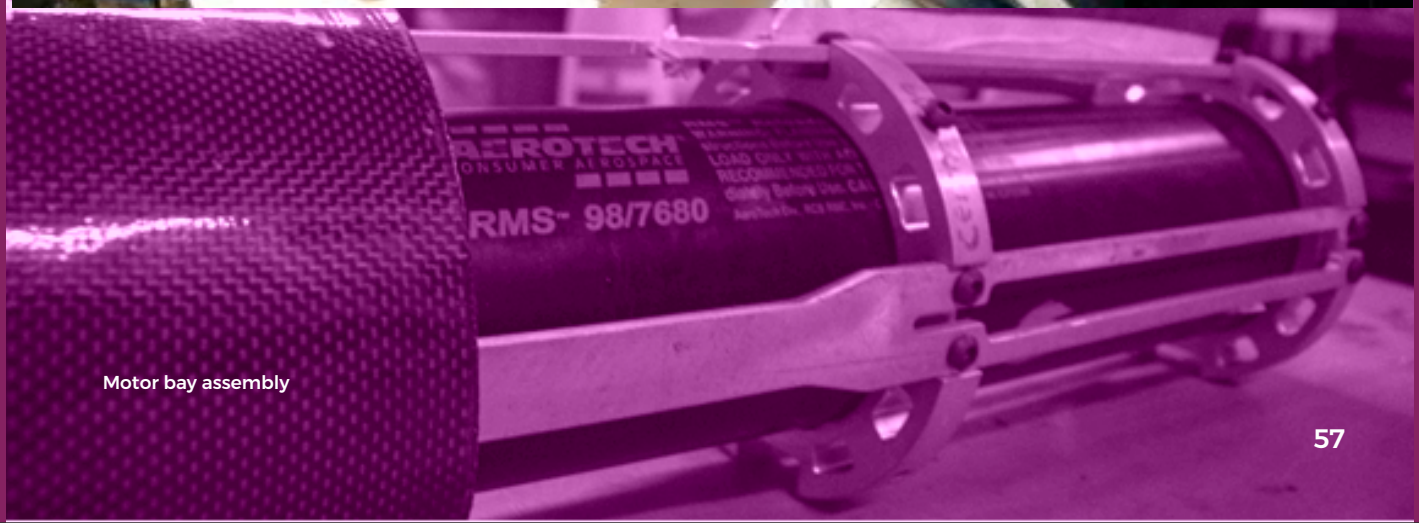
3D printed nose cone for the subscale rocket

Rendering of the rocket

The workshop of team thrustMIT

The avionics team calibrating their sensors

thrustMIT at Spaceport America Cup 2019

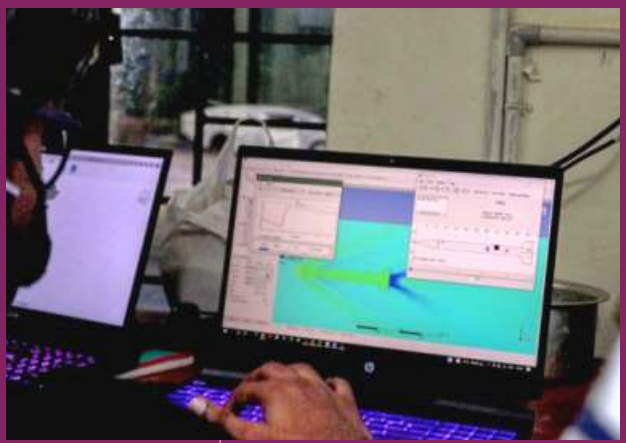


Motor bay assembly

Enthusiastic team members holding their sub scale rocket

Team members at Spaceport America Cup – 2022 venue at New Mexico

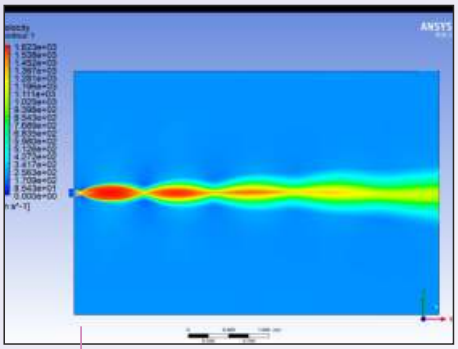
The aerodynamics team analyzing the flow simulations of the rocket



The aerodynamics team analyzing the flow simulations of the rocket

Assembly of motor bay

Pyrotechnic ignitor testing



Velocity contour of a rocket nozzle, with shock diamonds visible

ThrustMIT Team, 2022 – 23:

1. Ashwinraj Manikandan Renuka (Team Leader)

2. Emad Shattari (Team Manager)

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Faculty Advisor:

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https://www.linkedin.com/company/thrustmit/

https://www.instagram.com/thrustmit

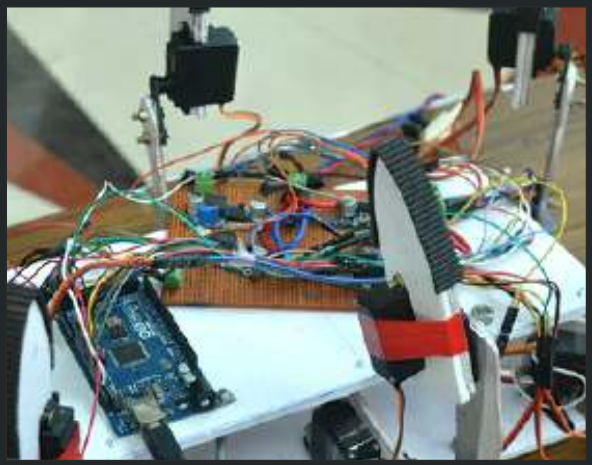
Robotics & Circuits

Robotics & Circuits Team, 2021-22

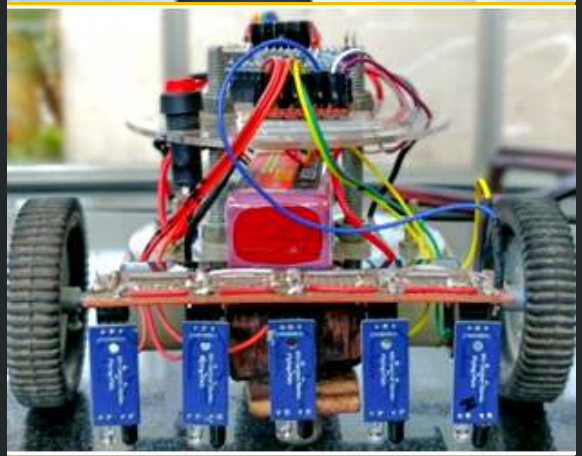
Robotics and Circuits Team, nick named as RnC, founded in 2010, focused towards research and development in the field of robotics in Manipal Institute of Technology, MAHE, Manipal.

- Team participates regularly in the international events, Virtual RobotX Challenge and RoboCup Rescue.
- It conducts robotic competition, "Vedanth", during the technical fest, "Techtatva", during every year.
- Team has published 1 paper in international journal, so far.
- The team participated in Virtual RobotX Competition, VRX 2022 on 12th April, 2022 and the team stood 12th Rank internationally, out of 100+ teams.

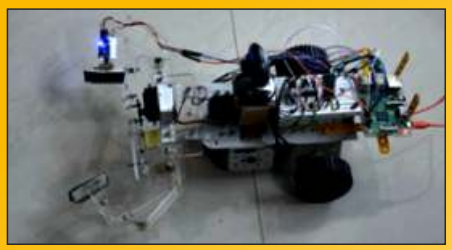
Auto-quadcopter:Semi-automatic drone, with four rotors, made with Arduino 328p UNO and mainly accelerometer, controlling the angle and Moment of Inertia of the drone.



All Terrain Hexapod: A six legged robotic system capable of traversing multiple terrains, includes a new sensor modality basedon servo feedback and real time terrain adaptive gaits.



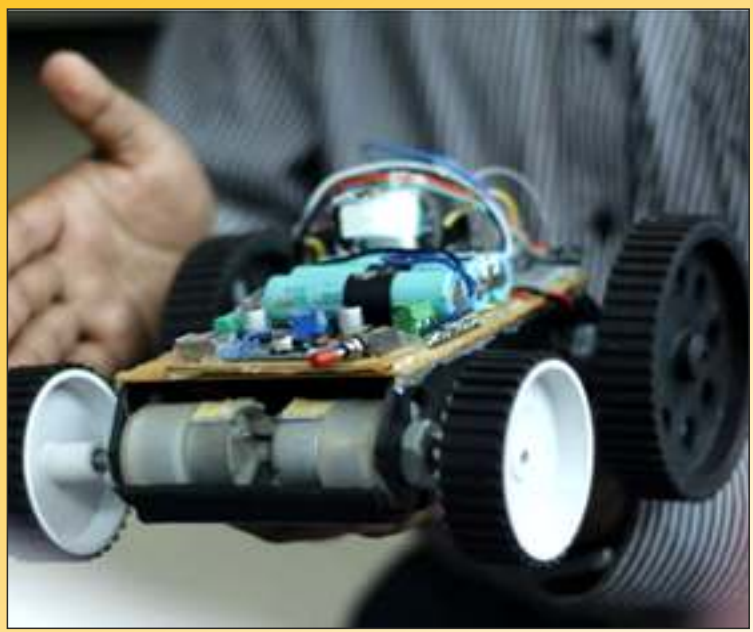
Maze Solver Bot:A LiPo battery powered moving bot that uses five IR sensors at the head of the bot to detect lines on a plane surface.



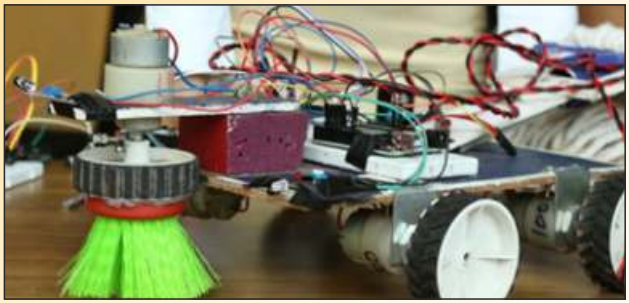
Object Recognition Bot:Wandering through the premises in search of the required item, the ORB retrieves objects using app-based commands.

Talking Glove:With the heart of gold and the arm of code, the Talking Glove lends a helping hand towards the deaf. It works on a fundamental idea- to convert gestures and signs into a speech output.

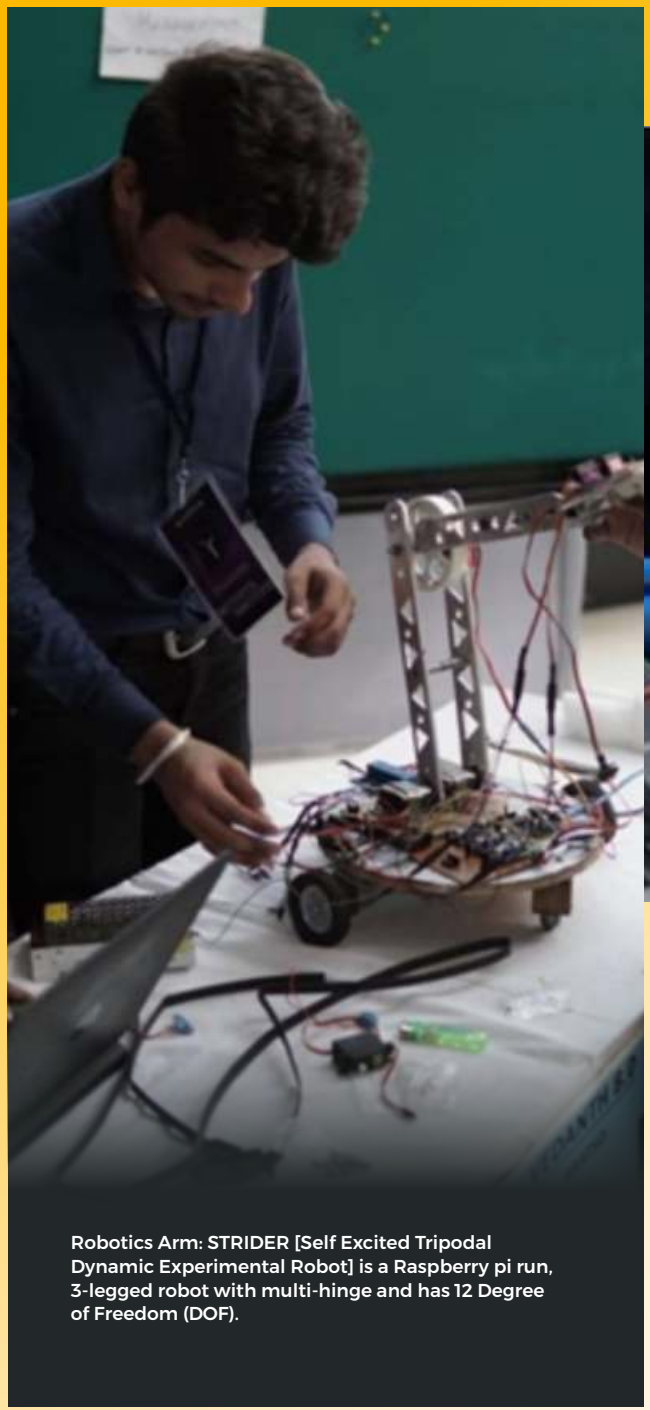
Home Automation:The project demonstrates a system capable of controlling home appliances including Lights and Fans, Music Systems power plugs both over a mobile application and automatically.



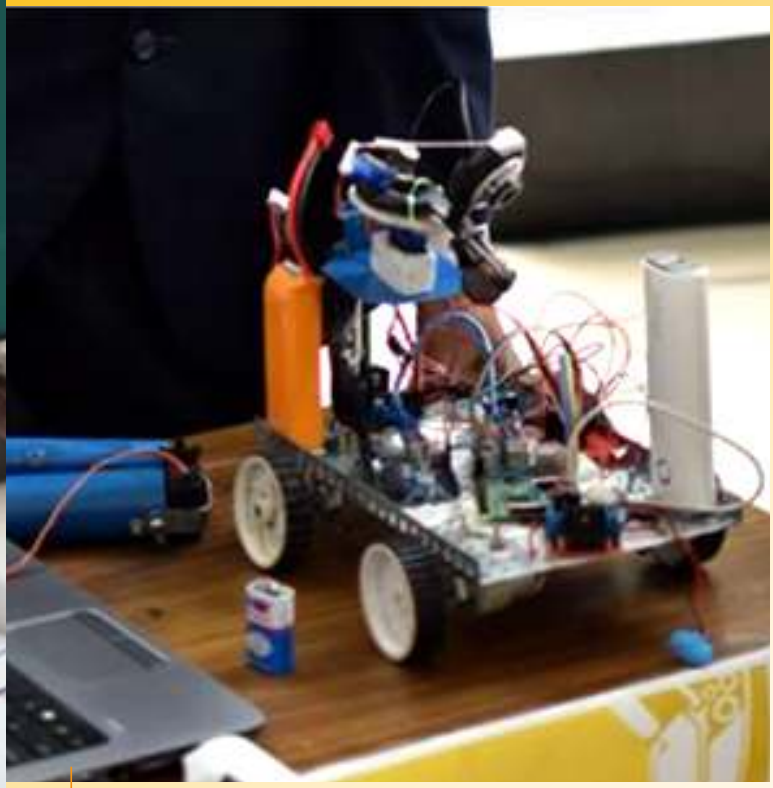
Internet Controlled Robot:Small surveillance robot with an inbuilt robotic arm and multiple sensing modalities, the bot can be controlled over the internet using an android app.



Home Servant:The home servant is sure to grow on all our lethargic souls, with it's extensive use of image recognition techniques to assist one with mundane and physically taxing chores.



Robotics Arm: STRIDER [Self Excited Tripodal Dynamic Experimental Robot] is a Raspberry pi run, 3-legged robot with multi-hinge and has 12 Degree of Freedom (DOF).



Surveillance Camera: An application of Computer Vision to security cameras, this project adds features including object and person tracking, and automated intruder alerts.

Team members who worked for RobotX Competition VRX 2022

Dual Axis Solar Tracking: The Dual Axis Solar Tracking Panel automatically configures itself in response to lighting and weather conditions to receive an optimal amount of solar energy to be generated into electricity.

Robotics & Circuits team, 2022 – 23:

1. Rambha Chaitanya Sai Nikith (Team Leader)

2. B L Siddhartha Bhat (Project Manager)

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Instagram - https://www.instagram.com/robotics_and_circuits/

LinkedIn - https://www.facebook.com/RnCmanipal/

Project Vision

Project Vision Team, 2021 - 22

Project Vision started in 2018, is the student team working on Augmented Reality/Virtual Reality in Manipal Institute of Technology, MAHE, Manipal. We develop Virtual Reality experiences for the Oculus Quest 2.

Our previous projects include:

EDU-AR: Augmented Reality app for visualizing complex 3D models in AR.

- Currently, the team is working on developing a Virtual Nature experience for the 2022 International AR/VR competition (Sweden).
- Our project is titled "GAIA: EMPOWERING NATURE," and it brings different aspects of the world home using Virtual Reality.
- Team has published 2 papers in the conferences, so far.

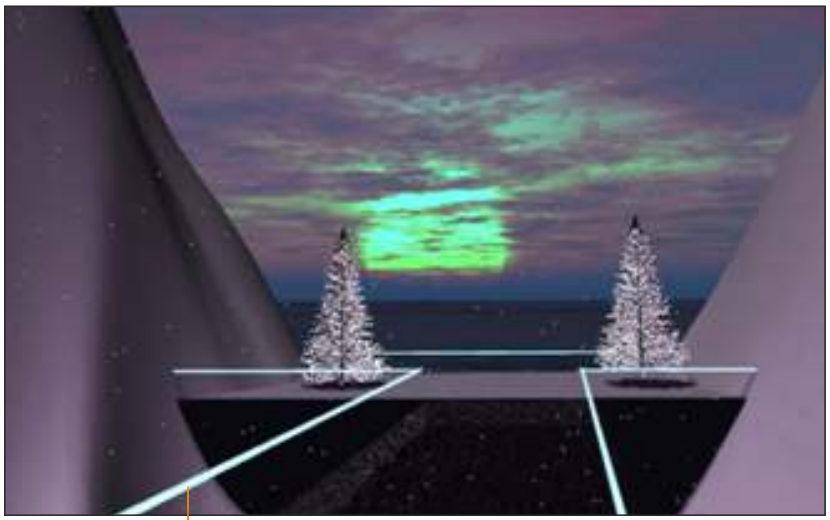
A picturesque view of our VR Desert Biome Game scene

In preparation for the 2022 International AR/VR competition (Sweden)

Home page of our VR nature experience for the 2022 International AR/VR competition (Sweden)

A peek into the frosty peaks in our VR experience

In the make of designing a frigid terrain in VR



Designing, optimizing & troubleshooting on the Oculus Quest 2

Project Vision Team, 2022 – 23:

1. Apoorv Shah (Team Leader)

2. Ananya Nair (AR/VR Head)

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R.U.G.V.E.D Systems

Team RUGVED Systems

R.U.G.V.E.D. Systems stand for Remote Unmanned Ground Vehicular Electronic Defense Systems, founded in 2017, is a multi-disciplinary team of highly motivated undergraduate students of Manipal Institute of Technology, MAHE, Manipal. focused on constructing various robots for military defense and law enforcement applications powered by multiple cutting edge technologies.

- Participates in the annual Intelligent Ground Vehicle Competition (I.G.V.C.) secured 8th position worldwide in the design challenge of I.G.V.C., 2018 at Oakland University, Michigan, U.S.A.
- Team has won in National level Tata Pioneer's Makerthon - UAV Challenge at the Techfest 2017 I.I.T. Bombay, designing an Auto-Leveling UAV Launchpad and again in 2018 and also 2nd place in G.M.E. Ford Hackathon, 2020.
- Published 1 paper in international journal and 3 papers in conferences, so far.
- Currently, the team is working on their flagship project, W.A.L.R.U.S, an autonomous reconnaissance vehicle that can traverse on land and houses a detachable drone for aerial surveillance which can scout for enemy targets and topology observation to generate a detailed map to get a lay of the land.

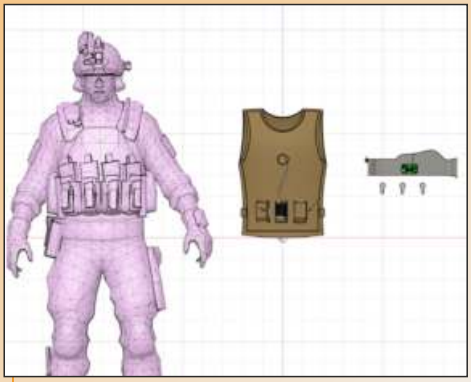
Robust Multi-class object detection done in real-time by a lightweight deep learning model.

Intelligent Ground Vehicle Challenge (IGVC), Held in Oakland University, Michigan, USA

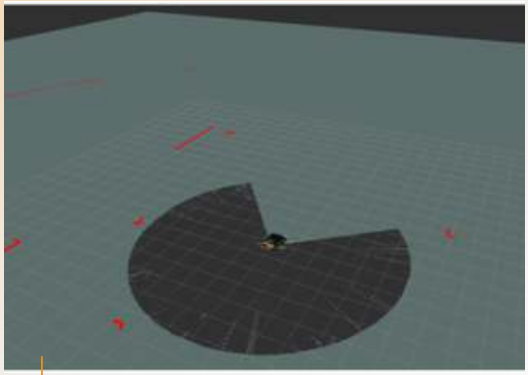
Members of RUGVED Systems ass[illegible] the Drone Launchpad, winning TATA Makerthon Ch[illegible]

RUGVED Systems secured 8th rank worldwide in IGVC design challenge in 2018

Drone Launchpad made by RUGVED Systems for the Tata Makerthon 2017 held at IIT Bombay



SAU(Soldier Assist Unit)- Wireless network of health monitor vests for soldiers



LIDAR Field of Vision on RViz of a Drone

A member of RUGVED Systems honing his skills for project WALRUS

Lane detection of the IGVC robot vehicle

R.U.G.V.E.D. Systems Team, 2022 – 23:
1. Jai Varma (Technical Head)
2. Dhruv Menon (Team Manager)
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https://instagram.com/rugved_systems?igshid=12akmvmrqisb4

Manipal BioMachines

Manipal Bio Machines Team, 2021-2022

Manipal BioMachines, founded in 2020, is the official synthetic biology and genetic engineering student project of Manipal Institute of Technology, MAHE, Manipal.

- In 2020, the motto of the team was to genetically engineer a bacterium that will be capable of converting methylmercury and other organic mercury compounds into elemental mercury in conditions prevalent inside the human gut.
- For 2021, the aim of the team was to make an overall sustainable alternative to traditional chemical pesticides that is modular in nature through synthetic biology and genetic engineering.
- Team has published 1 paper in the conference, so far.
- Competes in the annually held iGEM (International Genetically Engineered Machine) competition.
- One among 90 iGEM teams awarded $2500 grant, in 2021.
- Secured a bronze medal in the iGEM2021 event, held during February 2021
- Team is awarded with 2500$ iGEM Impact Grant, during 2022.
- Team participated in the iGEM – 2022 event at Paris, France, during October, 2022 & was one amongst the 173 gold medal winning teams, out of 350 teams.

Wet Lab Member, Manipal BioMachines'21 at work

Team Leader, Manipal BioMachines'21 at work

ManipalBioMachines Team at iGEM 2022 venue, Paris, France

Wet Lab Head, Manipal BioMachines'21 at Work

Wet Lab Head, Manipal BioMachines'21 at work

ManipalBioMachines Team 2022-23:
1. Suhani Kabra (Co Team Leader)
2. Tushar Mishra (Co Team Leader)

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https://2020.igem.org/Team:MIT_MAHE
https://www.facebook.com/ManipalBioMachines
https://www.linkedin.com/company/manipal-biomachines/?originalSubdomain=in
https://www.instagram.com/manipalbiomachines/

loopMIT

Rendered image of a Pod

loopMIT, established in 2019, is a dedicated team of undergraduate students of Manipal Institute of Technology, MAHE, Manipal, from various fields of engineering working on designing, developing and building a sub scale prototype transport vehicle known as the Hyperloop Pod.

- At present, the team is engaged in the design of the POD.
- Team has published 4 papers in the international journals, so far
- Team is aiming to participate in the SpaceX Hyperloop Pod Competition, in the near future.

Team members at work

loop MIT Team, 2022 – 23:

1. **Amrit R (Team Leader)**
2. **Pugazhendhi Priyan (Mechanical Head)**

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https://www.in.linkedin.com/company/loopmit

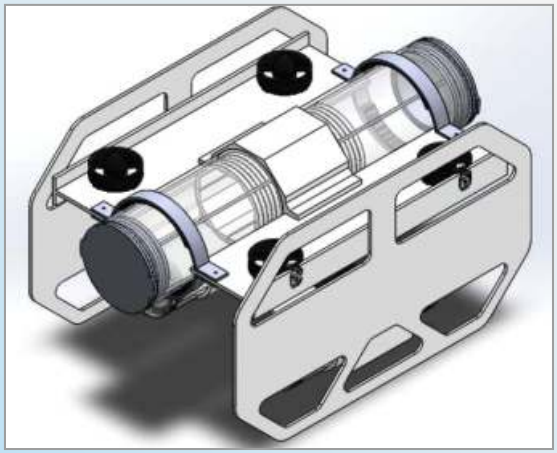
https://www.instagram.com/loopmit/?igshid=ea37cu3sngpj&hl=hi

Project AUV

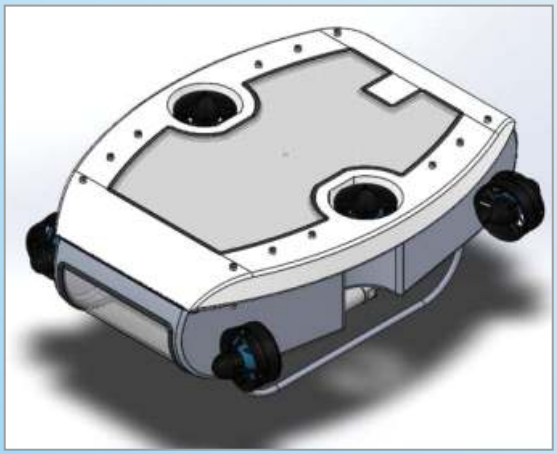
Project AUV Team members at work in their workshop

Established in 2019, Project AUV Manipal, Manipal Institute of Technology, MAHE Manipal is the official student team consisting of group of individuals brought together having a common interest in developing the Autonomous Under water Vehicle (AUV).

- In the Flipkart Grid Challenge held during 2022, the team stood one among 50 out 1000 teams qualified for 2nd round.
- The team is currently preparing for the event RoboSub 2023 to be held at USA.



Rendered images of the Bot



AUV Manipal Team, 2021- 22:

1. Somya Patnaik (Team Leader)

2. Pranav Subramanya (Team Manager)

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Faculty Advisors:

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https://www.instagram.com/project_auv_manipal

Team Combat Robotics

Team 2021 - 22

Team Combat Robotics, founded in 2018, is a team of enthusiast undergraduate students from different factions of engineering in Manipal Institute of Technology, MAHE, Manipal, working on building efficient combat capable robots.

- Team has built bots for 3 event categories: RoboWars, RoboSoccer and RoboSumo.
- Participated in events held at BITS Pilani Quark, IIT Bombay Tech Fest, NITK Suratkal and many more.

Robowar clash

Round 1 starts

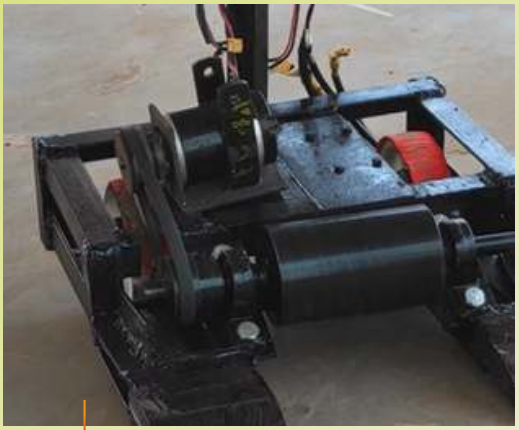
Robowar at TechTatva 19, MIT

Robowar 2022, NITK,Suratkal

Quick repairs between the matches

Crab, RoboSoccer

Testing the horizontal bar spinner

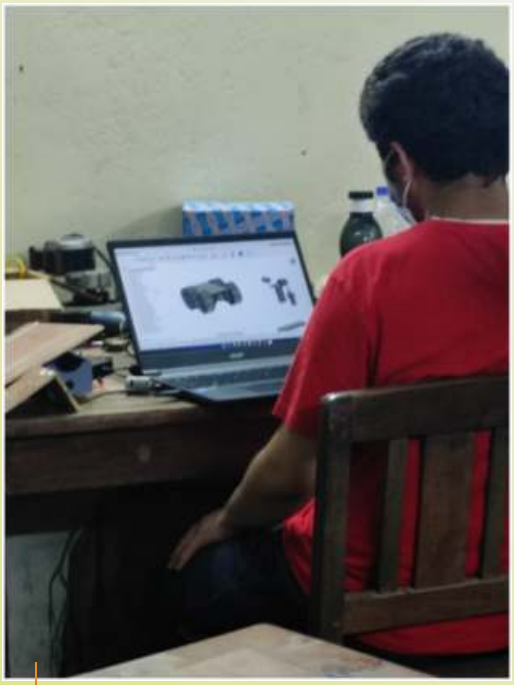


Testing the Drum Spinner

In the arena, ready for battle

Aura, 15kg bot

Preparation for Building Robo Soccer bot underway, using Angle Grinder



Mechanical Team working on bot design

Team Combat Robotics Team, 2022 – 23:

1. Puneeth S (Team Leader)

2. Mohammed Afnan Althaf Samad (Team Manager)

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https://www.instagram.com/teamcombatroboticsmanipal/?hl=hi

Cryptonite

Team of 2021 - 22

Cryptonite, founded in 2018, is the official ethical hacking and cyber security team of Manipal Institute of Technology, MAHE, Manipal. The team focus their work in the fields of attack-defense, cryptography, cyber forensics, reverse engineering, binary exploitation and web exploitation.

- Team hosted nite CTF- A 48hrs CTF competition which was rated 22.30/25 on CTFtime.
- This event of Cryptonite saw 1200+ participants from 43 countries including 27 university teams. Teams from UIUC, UD, Delaware, and FIT, Florida were also in attendance.
- Participated in Loki CTF 2021, CSAW'21 and ASIS CTF 2021 and won laurels.
- Published 1 paper in international journal and 8 papers in conferences, so far.
- Sohom Datta, Reverse Engineering Head was rewarded 3133.70 USD/(~2 lakh INR) for identifying a bug in one of Google's front-end open source libraries as part of Google's Vulnerability Rewards Program
- The team has participated in 57 CTF events, during June, 2021 – August, 2022.

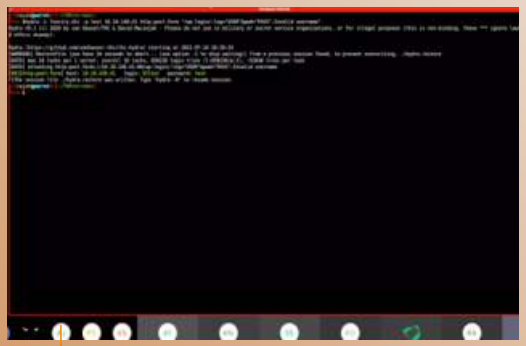
Abhay Narayan Secures
2nd Place at Inctf in August 2019

Workshop on Remote Code
Execution Held on 25th February 2022

First Batch of Cryptonite Team Recruits

Securebug Loki CTF 3rd Place Winners

Secured 7th place in wtfCTF 2022 hosted by Manipal Information Security Team (MIST)



Workshop on Penetration Testing Held on 24th July 2021

Groundwork for Hosting niteCTF 2021

Hosted niteCTF 2021

Student detects bug in Google, wins ₹2L

TNN | Times News Network

Manipal: A second-year engineering student from the Manipal Institute of Technology (MIT), MAHE has won a reward of approximately Rs 2 lakh as part of Google's Vulnerability Reward Program.

MIT Manipal tweeted Sohom Datta, a member of the Cryptonite project team (From CSE Dept) has identified a bug and was rewarded $3133.7 by Google's Vulnerability Reward Program.

Sohom told TOI, "I was looking for an open source library and found a bug in one of Google's programmes and reported the same. Google, to honour all the cutting-edge external contributions that help in keeping their users safe, maintains a Vulnerability Reward Program for Google-owned web properties. Once I reported the bug, I received a message that I have been rewarded $3133.7."

BIG WIN: Sohom Datta found the bug in Google's program while looking for an opensource library

He adding that rewards are generally based on the severity of the reported bug.

He is a member of the Cryptonite student project team of MIT, MAHE. The team works in the field of ethical hacking and cybersecurity and focuses on cryptography, forensics, research, reverse engineering and web exploitation.

He had participated in Google Summer of Code last year and is a mentor at Wikimedia. This is a global programme focused on bringing more student developers into open source software development.

SohomDatta, Head of Reverse Engineering Featured in Times of India

Team at Work

Cryptonite Team, 2022 - 23:
1. Kunyalik Garg (Team Leader)
2. Luhit Atluri (Cryptography Head)
Team Mail Ids: cryptonite.mit@manipal.edu;
teamcryptonite18@gmail.com

Faculty Advisors:
1.Dr.Balachandra
Department of Information & Communications Technology
bala.chandra@manipal.edu

2. Prof.Nisha.P.Shetty
Department of Information & Communications Technology
nisha.pshetty@manipal.edu

Links:
https://cryptonite.team/
https://www.cryptonite.team/ https://github.com/Cryptonite-MIT/
https://www.facebook.com/cryptonitemanipal/
https://www.linkedin.com/company/cryptonite-mit/?originalSubdomain=in
https://www.instagram.com/cryptonite_mit?igshid=kte0s63rszbl

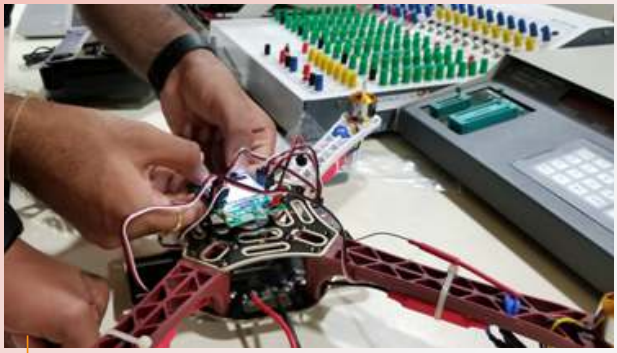
Dronaid

Dronaid Board Members, 2021-22

Dronaid, founded in 2017, is a one-of-a-kind student project initiated in Manipal Institute of Technology, MAHE, Manipal, with an effort to make healthcare more accessible and hassle-free in India by means of incorporating artificial intelligence (AI), Unmanned Aerial Vehicles (UAV) and app development in building a network of healthcare systems and bring about practical clinical applications in accidents and emergency services at the community level.

- Team is currently involved in developing an "Autonomous Drone System", using an Artificial Intelligence (AI) configuration/interface, that not only navigates on its own but also can make important in-flight decisions like determining shortest route and terrain assistance. These independent drones can then be integrated into what we call a "drone network".
- Project Dronaid was initiated as a unique collaboration between the students of Manipal Institute of Technology and Kasturba Medical College.
- The team participated in the event TechnoXian WDRC '22 event at New Delhi, during 21st& 22nd August, 2022 and stood 2nd place amongst 200 teams.

Testing of prototype drone 3



In-action still of setting up a transmitter unit in drone

A still of workshop conducted by project Dronaid on Dr

Display of two prototype drones worked on by the current team

Team participated in TechnoXian WDRC '22 event at New Delhi

Flight testing of drone for extended application of artificial intelligence

Members at work

Analysis of drone post flight

Dronaid Team, 2022 – 23:

1. Shivam (Team Leader)

2. Kabir Sachdev (Management Head)

Team Mail Id: **dronaid@manipal.edu**

Faculty Advisor:

Prof. Manikandan M

Department of Aeronautical and

Automobile Engineering

Mail: manikandan.m@manipal.edu

Links:

https://www.dronaid.in

https://www.facebook.com/dronaid.care

https://in.Linkeddin.com/company/dronaid/

https://www.instagram.com/accounts/login/

?next=/project.dronaid/

S.W.A.R.M Robotics

SWARM Robotics Team, 2021-22

S.W.A.R.M (Smart Wireless Autonomous Robotics Manipal) Robotics, established in 2017, the team in Manipal Institute of Technology, MAHE, Manipal, is to make a collective of multiple autonomous entities which are virtually independent of each other but interact and communicate with each other to reach a common goal, which may be simple tasks like mapping an unknown environment or complex tasks like performing search and rescue tasks in high risk environments, hereby reducing the risk to human life.

- Currently the team is working on advanced sensors and drivers being used by the team as a test bench for research in the field of autonomous swarms with a focus to make them more efficient and faster.
- Team has published 2 papers in the conferences, so far.

SWARM Robots developed by the team

An image of a robot developed by the team

S.W.A.R.M ROBOTICS Team, 2022– 23:

1. Piyaansh Thukral (Team Leader)

2. Hakka Madan (Technical Head)

Team Mail Id: swarm@manipal.edu

Faculty Advisor:

Dr. Jeane Marina D'Souza

Department of Mechatronics Engineering

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ACADEMY of HIGHER EDUCATION
(Institution of Eminence Deemed to be University)