

Athip Thirupathi Raj

Aerospace Engineer | NASA MIRO Scholar | University of Arizona | University of Michigan Ann Arbor

Email : athipt@arizona.edu
Phone : +1 (520) 535-3821
Location : Tucson, Arizona
Languages : English, Tamil

Educational Qualifications:

Degree	Year	Institution	CGPA/Percentage
PhD, Aerospace Engineering (Minor: Electrical Engineering)	2021 - Present	The University of Arizona	3.90/4.00
Master of Engineering, Space Systems Engineering	2016 - 2017	University of Michigan Ann Arbor	3.67/4.00
Bachelor of Technology, Mechanical Engineering	2012 – 2016	National Institute of Technology, Tiruchirappalli, India	7.76/10.0
Secondary School Leaving Examination, State Board	2012	Madras Christian College Matriculation Higher Secondary School, Chennai, India	96.2%
Matriculation School Leaving Examination	2010	Madras Christian College Matriculation Higher Secondary School, Chennai, India	94.4%

Relevant Coursework / Software:

1. Space Mission Analysis and Design (SMAD)
2. Robot Operating System (ROS)
3. Space Systems Design and Management
4. Spacecraft Instrumentation
5. Systems Tool Kit (STK), FreeFlyer, GMAT
6. AutoCAD, SolidWorks, Fusion360
7. Computational Multibody Dynamics
8. ANSYS Workbench, Autodesk Thermal Desktop
9. MATLAB, Python, C++
10. Additive Manufacturing (3D Printing) DMLS, FFF

Awards:

- **NASA Space Tech Catalyst 2024 Award**
Selected as one of the 20 winners of the NASA Space Tech Catalyst Prize for demonstration of best collaboration practices with diverse researchers, technologists, and entrepreneurs, while working as a NASA MIRO scholar and student mentor at the Space and Terrestrial Robotic Exploration (SpaceTReX) Laboratory at The University of Arizona, and proving the ability to engage and develop underrepresented groups in space technology development, broaden NASA's outreach efforts to diverse sources of developers, and build a community of emerging innovators equipped to compete for the agency's technology development opportunities.
- **GPSC Research and Project Grant – Winter 2024**
Awarded by the Graduate Professional Student Council (GPSC) of The University of Arizona to complete the project titled "Low Power LEDs for CubeSat Attitude estimation and VLC during proximity operations", a space robotics project to assist in small satellite proximity operations.

Publications:

1. Thirupathi Raj, A., Bouskela, A., Thangavelautham, J. "Design and Development of a Robotic Space Station for Near Earth Asteroid Detection," Accepted to AIAA ASCEND Conference, 2024.
2. Gross, N., Thirupathi Raj, A., Thangavelautham, J. "Power, Data, and Fuel Transfer with a Two-Stage CubeSat Docking Adapter," Accepted to AIAA ASCEND Conference, 2024
3. Thirupathi Raj, A., Thangavelautham, J. "A Comparative Analysis of Scheduling Algorithms for Distributed Observation Systems for Cislunar Traffic Management," Accepted to AIAA ASCEND Conference, 2024

4. Thirupathi Raj, A., Sturgeon, C., Bennett, M., Thangavelautham, J., "Exploration of Lighting Sequences of LEDs inside a controlled environment for accurate depiction of LEO Lighting conditions for GNC Applications," Accepted to AAS Guidance, Navigation and Control Conference, 2024.
5. Cutler, R., Thirupathi Raj, A., Thangavelautham, J., "Vision Sensor Aided Autonomous Mobility and Navigation for a Flatworm-Inspired Robot in Planetary Extreme Environments," Accepted to AAS Guidance, Navigation and Control Conference, 2024.
6. Thirupathi Raj, A., Rickel, J., Adhikari, R., Thangavelautham, J., "Machine Learning based Attitude Estimation Using Active Lighting Cues Applied to CubeSat Proximity Operations," Accepted to AAS Guidance, Navigation and Control Conference, 2024.
7. Gross, N., Thirupathi Raj, A., Thangavelautham, J., "Thermal and Structural Analysis of Modular Autonomously Assembled Truss Modules for Space and Lunar Surface Applications," Accepted to Earth and Space Conference, 2024
8. Thirupathi Raj, A., & Thangavelautham, J. (2024). A Case for Space Platforms: A Comparative Analysis of Spacecraft Architectures for Deep Space Observation. AIAA SCITECH 2024 FORUM. <https://doi.org/10.2514/6.2024-1149>
9. Muniyasamy, S., & Thangavelautham, J. (2024). Evaluating the Response of a Network of Autonomous Robots to Emergency Scenarios Inside a Lunar Base. In AIAA SCITECH 2024 Forum (p. 2543).
10. Thirupathi Raj, A., & Thangavelautham, J. (2023). Autonomous Logistics and Inventory Management in a Modular, Robotic and Extensible Space Station. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4683>
11. Vilvanathan, V., Thirupathi Raj, A., Vance, L., Enikov, E. T., & Thangavelautham, J. (2023). Sequential Control of Electromagnets for CubeSat Docking Attitude Alignment. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4667>
12. Zhang, A. L., Thirupathi Raj, A., & Thangavelautham, J. (2023). Generation of Functional Modular Space Station Configurations using Genetic Algorithms. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4722>
13. Kang, M. S., Thirupathi Raj, & Thangavelautham, J., (2023). Power Analysis for Optimum Illumination Conditions Using Lunar Operations Tower for Surface Activity. AIAA ASCEND 2023. <https://doi.org/10.2514/6.2023-4685>
14. Gross, N., Thirupathi Raj, A., & Thangavelautham, J. (2023). Shape Memory Alloy Based Hard Docking Mechanisms for two-stage CubeSat Docking. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4734>
15. Rickel, J., Thirupathi Raj, A., & Thangavelautham, J. (2023). Low Power LEDs for CubeSat Attitude estimation and VLC during proximity operations. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4730>
16. Biella, M., Verma, V., Vance, L., Thirupathi Raj, A., Muniyasamy, S., & Thangavelautham, J. (2023). Advancing Utilization of Spacecraft Swarms for Sample Return, Multipoint Observation and Space Traffic Management Using Inflatables. AIAA ASCEND. <https://doi.org/10.2514/6.2023-4634>
17. Thirupathi Raj, A., Fuhrman, C., Vance, L., & Thangavelautham, J. (2023, February). *Decentralized Coordination of a swarm of nanospacecraft for efficient sample return using Visible Light Communication (VLC)*. Advances in Astronautical Sciences, Breckenridge, United States.
18. Huie, R., Thirupathi Raj, A., & Thangavelautham, J. (2023, February). *Towards standardizing Lighting Cues for small spacecraft communication and swarm control*. Advances in Astronautical Sciences, Breckenridge, United States.
19. Zhang, A., Thirupathi Raj, A., & Thangavelautham, J. (2023, February). *Coordination of Modular, Extensible spacecraft swarm through the use of Machine Learning*. Advances in Astronautical Sciences, Breckenridge, United States.
20. Thirupathi Raj, A., Sturgeon, C., Wildridge, M., Baniszewski, A., Zhang, A., & Thangavelautham, J. (2023, February). *Design and development of a Lighting and Environment Simulation facility for a small spacecraft*. Advances in Astronautical Sciences, Breckenridge, United States.
21. Thirupathi Raj, A., Qiu, J., Biella, M., Matheson, I., & Thangavelautham, J. (2023, February). *The Impact of GNC on Small Satellite Mission Concepts to Near Earth Asteroids*. Advances in Astronautical Sciences, Breckenridge, United States.
22. Gitten, R., Greaves, B., Krawec, N., Raj, A. T., Szeffi, D., Arteaga, A., ... & Moldwin, M. (2023). Wastewater to Plant Nutrient System.
23. Thirupathi Raj, A., & Thangavelautham, J. (2022). High-Speed Docking and Applications for Small Spacecraft. ASCEND 2022. <https://doi.org/10.2514/6.2022-4331>
24. Vilvanathan, V., Thirupathi Raj, A., & Thangavelautham, J. (2022). Using Small Satellites to Remove Non-Cooperative Space Debris. ASCEND 2022. <https://doi.org/10.2514/6.2022-4222>
25. Thirupathi Raj, A., & Thangavelautham, J. (2022, October). *Visible Light Communication Algorithms for Small Spacecraft Formation Flying and Swarm Control*. International Astronautical Congress 2022, Paris, France.
26. Qiu, J., Thirupathi Raj, A., Vance, L., & Thangavelautham, J. (2022, October). *Asteroid Impactor Sample Return Mission Concept*. International Astronautical Congress 2022, Paris, France.
27. Thirupathi Raj, A., Zhang, A., & Thangavelautham, J. (2022, October). *Extensible, Transformative Spacecraft using CubeSats as Modular Building Blocks*. International Astronautical Congress 2022, Paris, France.
28. Qiu, J., Thirupathi Raj, A., Vilvanathan, V., Xu, Y., & Thangavelautham, J. (2022, October). *Establishing Distributed Control Networks in Smart Lunar Bases*. International Astronautical Congress 2022, Paris, France.
29. Boyala, G., Gremm, A., Gungor, A., Taghipour, A., Biella, M., Qiu, J. J., ... & Richards, L. (2022). Project Khepri: Feasibility Study of Mining Asteroid Benu.
30. Frost, E., Boyala, G., Gremm, A., Gungor, A., Taghipour, A., Biella, M., ... & Cue, M. (2022). Project Khepri: Mining Asteroid Benu for Water.
31. Thirupathi Raj, A., Qiu, J., Vilvanathan, V., Asphaug, E., & Thangavelautham, J. (2022, April). *Systems Engineering of Using Sandbags for Site Preparation and Shelter Design for a Modular Lunar Base*. ASCE Earth and Space Conference, Denver, United States.

32. Thirupathi Raj, A., Qiu, J., Vilvanathan, V., Xu, Y., & Thangavelautham, J. (2022, April). *Examination of Smart Sandbags for Semi-Permanent Structures on the Lunar Surface*. ASCE Earth and Space Conference, Denver, United States.
33. Thirupathi Raj, A., Sturgeon, C., & Thangavelautham, J. (2022, February). *Design and Experimentation of Geometric Mating Pairs for Small Spacecraft Docking*. Advances in Astronautical Sciences, Breckenridge, United States.
34. Diaz-Flores, A., Nichols, B., Raj, T. A., & Thangavelautham, J. (2024). ON-ORBIT CRYO-CENTRIFUGE PROTOTYPE FOR ADVANCING THE LUNAR ARK CONCEPT. In Springer eBooks (pp. 1845–1857). https://doi.org/10.1007/978-3-031-51928-4_105
35. Thirupathi Raj, A., Dinkel, A., & Thangavelautham, J. (2022, February). *Laboratory Experimental Validation of Lighting Cues for On-Orbit Rendezvous and Docking for Small Spacecraft*. Advances in Astronautical Sciences, Breckenridge, United States.
36. Thirupathi Raj, A., Vilvanathan, V., Biella, M., & Thangavelautham, J. (2022, February). *Evaluation of Non-Contact Autonomous Docking for Small Satellites*. Advances in Astronautical Sciences, Breckenridge, United States.
37. Thirupathi Raj, A., Nichols, B., Biella, M., & Thangavelautham, J. (2022, February). *Modelling Gravitational Anomalies For Low Altitude Small Spacecraft Science Missions*. Advances in Astronautical Sciences, Breckenridge, United States.
38. Smith, J., Thirupathi Raj, A., Cervantes, J., & Thangavelautham, J. (2022, February). *Laboratory Evaluation of Docking Capabilities of Small Spacecraft Using a Stewart Platform*. Advances in Astronautical Sciences, Breckenridge, United States.
39. Diaz-Flores, A., Thirupathi Raj, A., & Thangavelautham, J. (2022, February). *Rotisserie Mechanism and Digital Controller Design For Generating Artificial Gravity Onboard of Blue Origin Launcher*. Advances in Astronautical Sciences, Breckenridge, United States.
40. Thirupathi Raj, A., Diaz-Flores, A., & Thangavelautham, J. (2022). Catalyst: An Orbit Platform for Accelerating the Advancement of the Cislunar Economy. *AIAA SCITECH 2022 Forum*. <https://doi.org/10.2514/6.2022-2516>
41. Vance, L., Thirupathi Raj, A., & Thangavelautham, J. (2022). An Exploration of Sample and Return from Rubble Pile Asteroids via Capture of Ejected Particles. *AIAA SCITECH 2022 Forum*.
42. Thirupathi Raj, A., & Thangavelautham, J. (2021, October). *Active Lighting and Cues to Facilitate Cooperative On-Orbit Two-Stage Docking by Small Satellites*. International Astronautical Congress 2021, Dubai, UAE.
43. Diaz-Flores, A., Pedersen, C., Raj, A. T., & Thangavelautham, J. (2021). First Steps towards the Lunar Ark Concept: Saving Life on Earth from a Future Catastrophe. In Accelerating Space Commerce, Exploration, and New Discovery Conference (ASCEND), AIAA (2021-4240) (pp. 1-14).
44. Diaz-Flores, A., Pedersen, C., Thirupathi Raj, A., & Thangavelautham, J. (2021, September). *Cryopreservation of Organisms in Space in Preparation for Interstellar Travel*. Interstellar Research Symposium 2021, Tucson, United States.

Conference Presentations:

1. Thirupathi Raj, A., & Thangavelautham, J. (2023, May). CubeSat swarms in Cislunar space to identify, analyze, and characterize events of interest. Interplanetary Small Satellite Conference.
2. Gross, N. C., Thirupathi Raj, A., & Thangavelautham, J. (2023, May). Shape Memory Alloy Based Hard Docking Mechanisms for two-stage CubeSat Docking. Interplanetary Small Satellite Conference.
3. Rickel, J., Thirupathi Raj, A., & Thangavelautham, J. (2023, May). Low Power LEDs for CubeSat Attitude estimation during proximity operations. Interplanetary Small Satellite Conference.
4. Cutler, R., Thirupathi Raj, A., & Thangavelautham, J. (2023, May). Flatworm-Inspired Robot for Extraterrestrial Exploration. Interplanetary Small Satellite Conference.
5. Thangavelautham, J., Thirupathi Raj, A., Muniyasamy, S., Kang, M., (2023, May). Evaluation of Artificial Neural Tissues for Small Multirobot Networks in Handling Emergencies Onboard Next-Generation Space Stations. Interplanetary Small Satellite Conference.
6. Thirupathi Raj, A., Sturgeon, C., Wildridge, M., Baniszewski, A., & Thangavelautham, J. (2023, May). Simulation of LEO Lighting Conditions for Small Satellite testing. Interplanetary Small Satellite Conference.
7. Thirupathi Raj, A., & Thangavelautham, J. (2022, May). Extensible, Transformative Spacecraft Using CubeSats and Modular Building Blocks. Interplanetary Small Satellite Conference.
8. Thirupathi Raj, A., & Thangavelautham, J. (2022, May). High-Speed Docking between Small Spacecraft. Interplanetary Small Satellite Conference.
9. Thirupathi Raj, A., Rickel, J., & Thangavelautham, J. (2022, May). Visible Light Communication Between CubeSats During Close Proximity Operations. Interplanetary Small Satellite Conference.
10. Thirupathi Raj, A., Sturgeon, C., & Thangavelautham, J. (2021, May). Two Stage CubeSat Docking with Visual Cues. Interplanetary Small Satellite Conference.

Academic / Teaching Work:

- **Graduate Student Instructor (GSI): Teaching Assistant Fellowship in the College of Engineering, University of Michigan:**
(May 2017 – August 2017)

Worked as a GSI under the guidance of Dr. Joyce Penner (penner@umich.edu), Ralph J. Cicerone Distinguished University Professor of Atmospheric Science for the course CLIMATE 105 – “Our Changing Atmosphere” for the Spring/Summer term of 2017 at the University of Michigan.

Work Experience / Project Work / Training:

- **Space and Terrestrial Robotic Exploration (SpaceTReX) Laboratory, University of Arizona** (February 2021 – Present)
 1. Currently Leading a student team of 8 Undergraduate Researchers as a Team Lead in the CubeSat Docking Project. Mentored over 30 students overall.
 2. Provisional Patents - LED Active Lighting Cues for small satellite proximity operations and 0.5U two stage CubeSat docking adapter with power and data transfer.
 3. Designed and Fabricated the SWORD (Spacecraft Workings and On-orbit Robotics using Drones) Facility, a Low Earth Orbit, and Deep Space Lighting Environment Simulator for testing small satellite Proximity Operations, Optical Navigation, and Visible Light Communication.
 4. Programmed a 6 Degree of Freedom Universal Robotics Robotic Arm using Robot Operating System (ROS) to perform pick and place operations of sandbag building blocks to build SuperAdobe structures as temporary habitats on the lunar surface.
 5. Two-time finalists selected for Stage-2 of NASA Flight Opportunities (2021, 2022) while working as a Systems Engineer in the (Asteroid Origins Satellite) AOSAT Project.
 6. Co-Authoring 37 Research Papers (Conference) in the past 3 years in the above-mentioned projects.
- **Agnikul Cosmos: Semi-Cryogenic Thrust Stand** (January 2019 – September 2019)

Worked as a Space Systems Engineer at Agnikul Cosmos, a launch vehicle manufacturing startup incubated at the Indian Institute of Technology Madras (IIT Madras) where I worked on the design, development and testing of **India's first Additively Manufactured Semi-Cryogenic Liquid Rocket Engine**. Was involved in the 3D Modeling, development of verification and validation methods of Additively Manufactured parts by Direct Metal Laser Sintering (DMLS) and Multi-Jet Printing (MJP). The design and the fabrication of the engine is complete, and the fabrication of the testing facility is underway.
- **Agnikul Cosmos: Systems Engineering Framework** (October 2018 – September 2019)

As the Space Systems Engineer at Agnikul Cosmos, worked on laying out the following Frameworks and Systems Engineering principles:

 1. Requirements Management and Design Framework (Avionics)
 2. Version Control Framework
 3. Process Flow Framework
 4. Documentation Framework
- **Agnikul Cosmos: Configuration Documentation for “AgniBaan”** (January 2019 – March 2019)

Worked as the Lead Systems Engineer and Document Editor for the Version 2.0 of the Configuration Documentation of “AgniBaan”, a 3 stage rocket with fully 3-D printed clustered Semi-Cryogenic Liquid Fuel propelled rocket engines.
- **Agnikul Cosmos: Design Documentation for “SAR – Small AgniBaan Rocket”** (October 2018 – December 2018)

Worked as the Lead Systems Engineer and Document Editor for the Version 1.0 of the Design Documentation of “SAR – Small AgniBaan Rocket”, a single stage rocket with fully 3-D printed clustered Semi-Cryogenic Liquid Fuel propelled rocket engines, a technology demonstrator mission for Agnikul's bigger rocket, the “AgniBaan”
- **Research Associate: IIT Madras Additive Manufacturing Lab** (June 2018 – September 2018)

Worked as a Research Associate at IIT Madras on the applications of additive manufacturing for space exploration, under the guidance of Professor Soundarapandian and Professor Senthil Murugan from the Aerospace Engineering department of the Indian Institute of Technology Madras (IIT Madras). The current areas of focus in research at the lab are additive manufacturing in space environment (microgravity) and In-Situ Resource Utilization (ISRU) for future manned space missions.
- **NASA Exploration Habitat Challenge 2016: Michigan Bio-regenerative Life Support Systems (BLiSS)** (September 2016 – May 2017)

Worked as the Science Team Lead in this project under the guidance of Professor Nilton Renno, UMICH Space Engineering and sponsored by NASA Kennedy Space Center. Lead/Manager of the Biochemistry Sub team (The Science Team) of the team which won the **NASA X-Hab Challenge** in 2016. The project aims to design a system which converts Astronaut urine into a nutrient solution for plants growth in deep space missions. The design was successfully prototyped in April 2016 and was reviewed at the Kennedy Space Center at May 2017.

- Orbital – ATK: Design of a Space Habitat for Deep Space Manned Missions** (August 2016 – December 2016)
 Designed a modification for the Orbital ATK Cygnus vehicle to convert it to a **deep space habitat** capable of growing plants autonomously and providing a supplemental vegetarian diet to crew of astronauts. The design is a semi-autonomous Bio-regenerative Life Support System (BLSS) that will provide future astronauts in deep space exploration missions with nutrition, oxygen, and wastewater treatment. All the relevant subsystems were sized and budgets were prepared, and a mission to cis-lunar orbit was proposed as a proof of concept.
- NASA Exploration Habitat Challenge 2017: 3D Printed Plant Substrate** (September 2017 – December 2017)
 Worked as the Science Team Lead in this project under the guidance of Professor Nilton Renno, UMich Space Engineering and sponsored by NASA Exploration Habitat Challenge. The project aims design and develop a reusable 3D printed plant substrate that will facilitate the growth of plants in microgravity. Successfully passed SDR with the Kennedy Space Center in October 2017 and proceeding towards PDR, CDR and prototyping in the upcoming months.
- Design for Greenhouses on Mars: Michigan Bio-regenerative Life Support Systems (BLISS)** (September 2016 – December 2016)
 A project under the guidance of Professor Nilton Renno, UMich Space Engineering. Designed and fabricated scaled-down Geodesic Domes as a proof of concept for construction of Greenhouses on Mars. Tested the models in a Vacuum Chamber for stress strain properties and quality of sealants.
- Building Design: 3D Modelling of a residential duplex house** (February 2018 – April 2018)
 Constructed a detailed 3-D model of a 3 story residential building (including 2-D plan and building skeleton). The building plan has been approved by the Government of Tamil Nadu, and is scheduled to be constructed in Chennai, India, in the near future.
- NASA Jet Propulsion Laboratory: A proposal for a cubesat constellation secondary payload on the Mars 2022 orbiter:** (January 2017 – April 2017)
 Worked as a Systems Engineer on a project sponsored by NASA Jet Propulsion Laboratory for a secondary payload concept for the Mars 2022 orbiter, called Deep Space 9. The proposed architecture was a system of 6 cubesats in two constellations, performing Radio Occultation and Imaging operations for atmospheric wind mapping with global coverage with less than two-hour revisit time and to obtain atmospheric temperature and pressure profile observations from the surface to an altitude of 80 km. Prepared the various budgets such as Delta-v, Data, Link, Power, Mass, Volume and Cost Budget and Scheduling Operations. The proposal was presented in the Low-Cost Planetary Missions (LCPM) Conference 2017 at JPL.
- University Of Michigan – Vayu: A Weather Balloon mission for very high resolution imaging and Dust Profiling of the Earth's Atmosphere:** (January 2017 – April 2017)
 Worked as a Systems Engineer in a weather balloon mission for very high altitude high resolution (2k resolution) imaging and profiling of dust concentration from the surface to an altitude of 30 km over Michigan. The payload consisted of a dust sensor, temperature sensor, pressure sensor, thermistor, humidity sensor, accelerometer, GPS sensor, communications subsystem and two high resolution cameras. The mission was launched on March 31st 2017 and the payload was recovered successfully.
- Gyrocopter: A Mechanism for Selective Regulation** (November 2015 – March 2016)
 A Project under the guidance of Dr. K. Pannirselvam, Associate Prof. Department of Mechanical Engineering, NIT Trichy. Linking the Main Rotor to the Thrust Engine in a Gyrocopter, where the project aimed to design a suitable switching mechanism for a Gyrocopter to automatically handle the rotation of the main blades from the thrust propeller. This project has currently been taken for prototyping by Hindustan Aeronautics Limited, a leading Aeronautics and Aerospace company in India.
- Fan Wing Aircraft** (November 2014 – March 2015)
 Project Manager for the design project “Fan Wing Aircraft” under the guidance of Dr. N. Siva Shanmugam, Asst. Prof, Department of Mechanical Engineering of NIT Trichy, where I mentored a team of sophomores for the design and construction of the Fan Wing Aircraft. The project won the First Place in “Sangam’15”, the project presentation competition in Pragyan’15 the ISO Certified International Techno-Management Organization of NIT Trichy.
- In-Plant Training: Royal Enfield Automobiles** (July 2014)
 Underwent In-Plant training in Royal Enfield Automobiles in Thiruvottriyur, Chennai. The training involved in comprehending the machining of engine and chassis parts and understanding the assembly of a motorcycle. Assembled a 350cc Royal Enfield Engine in the Engine Assembly Wing during the training.
- RC Hovercraft** (May 2014)
 Designed, constructed, piloted and tested two fully functioning RC Hovercrafts under the guidance of Dr. N. Siva Shanmugam, Asst. Prof, Department of Mechanical Engineering, NIT Trichy. The hovercrafts were then used to participate in the event “Overdrive”, the hovercraft racing competition of Tathva’14, the national level technical competition held in NIT Calicut during 31st October to 2nd November 2014 and won the Third Place.

- **Workshop: RC Hovercrafts and Quadcopters** (May 2014)
Conducted a workshop on “fabrication of Hovercrafts” to the students of NIT Trichy, where the theory of Aerodynamics, introduction to RC Components and the fabrication of RC Hovercrafts were taught to the sophomores of NIT Trichy over a span of 4 days. This workshop gave valuable teaching experience.

Extra-Curricular Activities:

- Worked as **Project Manager** for 35 design projects as the head of the Exhibitions and Sangam team of Pragyan’16, the ISO Certified International Techno-Management Organization of NIT Trichy, India.
- Captain and Manager of the NIT Trichy Swimming team from March 2013 to March 2016.
- **Governing Council Member** of the Internet of Things Innovation Centre and The Innovation Centre of NIT Trichy.
- **Overall Coordinator**, Aquatics Competitions of Sports Fete 2015 and **Manager** of the Athletics team of the Mechanical Engineering Department in Sports Fete 2014, the Intramural Sports Meet of NIT Trichy, India.
- **Manager** in the LEAP Club (League of Environmental Awareness and Protection), the Environmental Awareness Club of NIT Trichy, organized a rally in Trichy to raise awareness among the people against Deforestation.
- Planted 1000 saplings in and around Tiruchirappalli, India along with the members of LEAP.
- Won **43 Gold, 48 Silver and 29 Bronze medals** in swimming ranging from State, National to International tournaments over a period of 15 years.