



# ROBOTECH

Monthly Newsletter

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### Vision

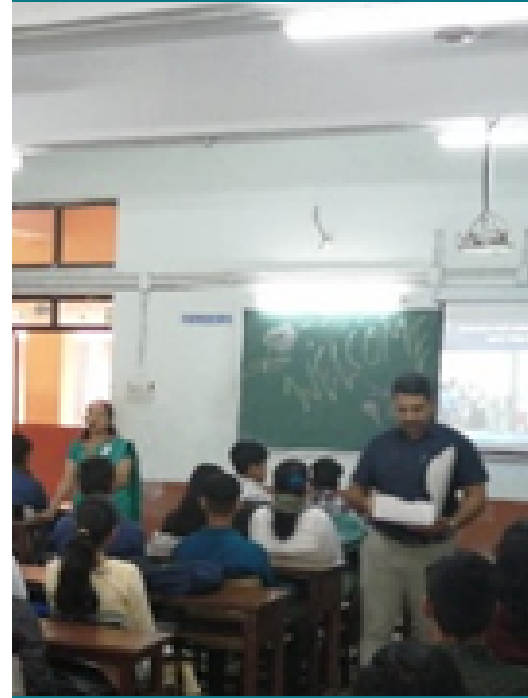
Progress through  
quality education and  
evolve into a center of  
academic excellence in  
the field of Robotics  
and Automation

### Mission

To provide a  
supportive academic  
environment for  
value-added  
education and  
continuous  
improvement. To  
develop society  
responsible engineers  
with technical  
competence and  
leadership skills

# Welcome to the Robotics and Automation Department

Our department is a hub of innovation and cutting-edge research in the fields of robotics and automation. Led by a dedicated team of faculty members with diverse expertise, we are committed to providing you with a comprehensive and enriching academic experience. Discover the various academic programs and courses we offer, tailored to equip you with the skills and knowledge necessary for a successful career in robotics and automation. Stay tuned for upcoming departmental events, seminars, workshops, and conferences. These gatherings provide invaluable networking opportunities and insights from professionals in the field. Your participation can be a stepping stone to your future career



## Robotics Boot-camp: Boosting pupils' skills for future robotics

The Department of Robotics and Automation recently held the highly anticipated Robotics Boot-camp 2023 from September 22nd to September 24th. The event was divided into a two-day boot camp and a One-day Hackathon and was generously funded by the prestigious organizations ISA, TRS, Sinrorobotics, Quadragech, and Srishti Robotics.

Dr. Vinila M. L., the Department Head, delivered a warm welcome address, highlighting the significance of the event and expressing gratitude towards the sponsors for their support. The ceremony was inaugurated by the College Principal, Dr. Sreepriya S.

The first day of the event was devoted to drone building and flying sessions, which were led by the highly skilled third-semester Robotics student, Indrajith V. S. The participants were taught the basics of drone building and were given hands-on experience in flying the drones. The day concluded with an engaging presentation on ROS by a Sinrrobotics speaker, who provided valuable insights on the latest trends and advancements in the field of robotics.

The second day of the event centered around mobile robotics, specifically the Robo Soccer Bot building. The participants were allowed to showcase their creativity and expertise in designing and testing their soccer bots. The day concluded with an insightful talk on Underwater Robotics, delivered by the CEO of Srishti Robotics, Sunil Paul. The talk was highly informative and provided the participants with a clear understanding of the current challenges and opportunities in the field of Underwater Robotics. Overall, the Robotics Bootcamp 2023 was a huge success, providing an excellent platform for robotics enthusiasts to learn, connect, and explore their passion for robotics.





# HACKATHON SHOWDOWN

## Industrial Water Tank Control System Triumphs

In a thrilling hackathon hosted by the Robotics Department as a part of Robotics Bootcamp, student teams from different technical universities gathered to compete in a day-long competition. The challenge was to create a working mechanism based on one of two topics: Traffic Management System or Industrial Water Tank Control System. With only five days to prepare and a mere five-hour time limit on the day of the event, participants had to bring their own materials, with just a computer provided for programming and simulation support.

The competition was fierce, but the victors of the day were a group of second-year students from Robotics and Automation. The winning team, comprised of Aditya Nikhil, Lakshmipriya K A, Kayva Venu, and Adharsh R Nair, chose the challenging Industrial Water Tank Control System project. They were awarded by the coordinator of the event, Prof.Sreedeeep Krishnan, staff advisor of ISA & TRS ASIET chapter, for their exceptional problem-solving skills, technical expertise, and teamwork to successfully complete their prototype within the given time frame.

Congratulations to them for their impressive win. This hackathon experience underscores the dynamic nature of such events, where aspiring engineers can push their boundaries, showcase their skills, and create groundbreaking solutions. We look forward to more exciting hackathons in the future, providing opportunities for young talents to shine and innovate.



## Second-year internship at SinroRobotics— A glimpse into dynamic technologies.



This semester seventeen students of Robotics and Automation department of ASIET took part in the SinroRobotics 7-Day Robotics Training Program, which was held from September 7th to 15th, 2023. The collegians were familiarized with 3D modeling using SolidWorks, which comprised of intriguing lessons on advanced sketching techniques, assemblies and parts design, and other various know-hows. The participants had hands-on engagement with Arduino, a fundamental platform in the field of electronics and robotics, in addition to various 3D printing techniques and their materials. The Robot Operating System (ROS), which forms the cardinal factor in robotics development as well as computer vision & face detection using Python were introduced to the students during the session.

## "Unlocking Potential: Know Up Knowledge Foundation's 5-Day Placement Training Program"

In the fast-paced world of job hunting, preparation is the key to success. Know Up Knowledge Foundation, a renowned educational institution, recently conducted a power-packed 5-day Placement Training Program that left students equipped with valuable skills and knowledge. Over the course of this program, participants delved into the realms of programming in C for three days and then shifted gears to focus on aptitude, reasoning, and personality development for the remaining two days.



### Day 1-3: Mastering the Art of C Programming (11th,12th,13th)

The program kicked off with three intense days dedicated to C programming. Under the guidance of an experienced instructor, students embarked on a journey to master one of the most fundamental and versatile programming languages. Topics ranged from the basics of syntax and data structures to more advanced concepts like arrays, functions, etc. Hands-on coding exercises were provided helping students build a strong foundation in programming.

Day 4-5: Aptitude, reasoning, and personality development (14th and 15th September ). Students were introduced to the art of solving aptitude and reasoning questions efficiently. Through interactive sessions and practice exercises, students honed their problem-solving abilities, critical thinking skills, and numerical aptitude. The program equipped them with strategies to tackle various aptitude tests commonly used in recruitment processes. Sessions on communication skills, interview etiquette, and presentation skills were conducted to prepare students for interviews and group discussions.



## ROS WORKSHOP

The department conducted a 3-day workshop on ROS on 7th,8th, and 9th September for the S5 students. Chinmohan sir of Saintgits College was invited to teach the students about ROS tutorials.

Day 1: Students were given a brief idea of what ROS is about and what opportunities it provides. Further, they were taught the usage of LINUX and then taught basic ROS tutorials

Day 2: Topics such as turtle sim and gazebo were taught. This created a lot of enthusiasm among the students.

Day 3: On the final day, students were taught how to set up a real world in a ROS. This helped the students to use it in the projects they started in the future.



# Prospect of Visual SLAM in Space-Robotics

To overcome these challenges, researchers and engineers are working to optimize visual SLAM algorithms for computational efficiency, ensuring that they are highly reliable and resilient to hardware failures. Additionally, redundancy and fault tolerance are vital in space missions to ensure that the system continues to function correctly even in the event of hardware failure.

In summary, the synergy between space robotics and visual SLAM is ushering in a new era of space exploration, bringing us closer to unraveling the mysteries of the universe. As researchers and engineers continue to refine visual SLAM for space applications, we can expect even more remarkable achievements in our quest to explore the cosmos. With its ability to enable autonomous navigation, obstacle avoidance, mapping, and exploration, visual SLAM is poised to play a pivotal role in future space missions, including lunar exploration, Mars missions, and beyond. The future of space robotics is exciting, and visual SLAM technology is undoubtedly a game-changer in this field. The realm of space exploration has always been fraught with challenges and complexities, necessitating the development of innovative solutions to overcome the unknown and hostile environments of outer space. In this quest, robotics has emerged as a crucial tool, with technology playing an ever-increasing role as we venture deeper into the cosmos. A transformative solution for space robotics that is currently gaining traction is Visual Simultaneous Localization and Mapping (SLAM).

Visual SLAM is a cutting-edge technology that empowers robots to navigate and map their surroundings using cameras or other visual sensors. Unlike traditional SLAM techniques that rely on laser scanners or ultrasonic sensors, visual SLAM employs computer vision algorithms to interpret visual data, making it an especially promising technology for space exploration.

One of the most significant advantages of visual SLAM technology is its ability to facilitate autonomous navigation in space missions. This feature is critical for ensuring the success of long-duration missions to distant celestial bodies, as it enables space robots such as rovers and drones to navigate without constant human intervention. By leveraging visual SLAM, these robots can detect and avoid obstacles in real-time, navigate through their environment, and create detailed 3D maps, which are highly valuable for mission planning and scientific exploration.

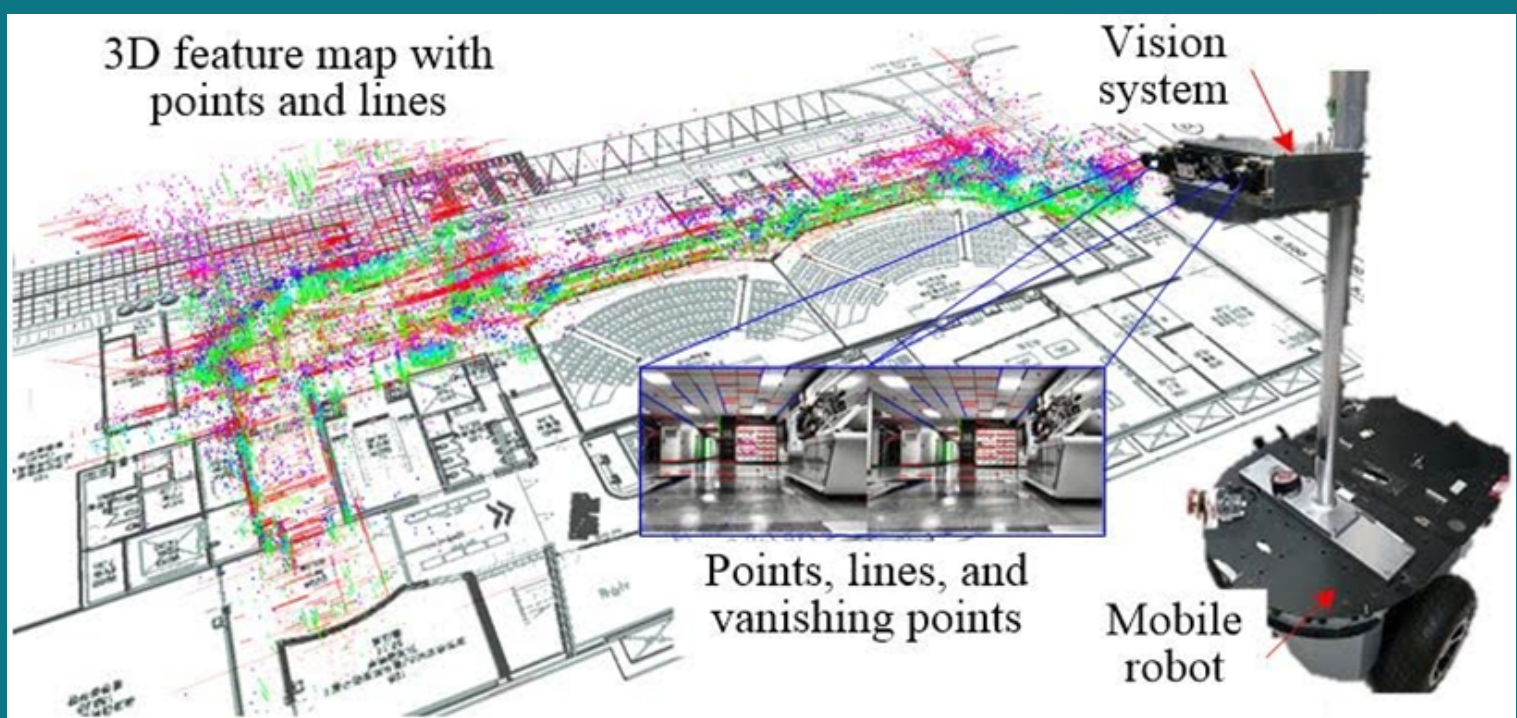
Moreover, visual SLAM also enhances the teleoperation of robotic assets by providing operators with real-time visual feedback. This feature is particularly useful in situations that require human intervention, such as performing complex scientific experiments or repairing equipment.

Despite its numerous benefits, visual SLAM technology faces significant challenges in the harsh conditions of space. The sensors and algorithms must be robust enough to operate effectively in environments with extreme temperatures, radiation, and vacuum conditions. Communication delays between Earth and space robots can also impede decision-making, making on-board decision-making capabilities a potential leap forward.

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