

Community & Outreach

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-A. Outreach Activities

AUV-IITB actively engages with the community through various workshops and exhibitions each year. These events serve as platforms to inspire young students from schools and high schools to explore the field of robotics. During these exhibits, the team showcases the functionality of their AUV, followed by a detailed seminar and a Q&A session to enhance students' understanding and interest in AUVs and robotics.

interactive session aimed to introduce young learners to the field of underwater robotics and the work undertaken. Through engaging demonstrations and simplified explanations, we showcased how autonomous underwater vehicles operate, the challenges they address, and the importance of robotics in marine research and exploration. The event served as an inspiring platform to spark curiosity about science, engineering, and technology among children in rural India.



Fig. 1: Displaying the vehicle to students at an exhibition

Technology Awareness Session: Hiware Bazar Rural Immersion Camp

As part of our commitment to outreach and knowledge dissemination, we participated in a Rural Immersion Camp. The camp was held in Hiware Bazar, Ahmednagar, Maharashtra. During the two-day camp, we conducted a Technology Awareness Session for primary school students in the village. This



Fig. 2: Technology outreach at Hiware Bazar

WISE: Empowering Future Women in Science and Engineering

The Women in Science and Engineering (WISE) program invites around 200 high school girls to IIT Bombay's campus every year for a few days of immersive exposure to cutting-edge technology and scientific exploration. As part of this initiative, AUV-IITB had the pleasure of presenting our autonomous underwater vehicle (AUV) to these aspiring young scientists, wherein we offered these bright young minds a glimpse into the exciting world of underwater robotics, encouraging them to see themselves as future leaders in science and engineering. Through WISE, we're proud to play a role in inspiring and empowering the next generation of female in-

novators.



Fig. 3: An interactive session with the WISE community

Autodesk

Before decommissioning Matsya 6, we had the privilege of presenting the vehicle to the CEO of Autodesk. As part of this engagement, we conducted a study on handle design using Autodesk's Generative Design tool, successfully optimizing for both weight and ergonomics to improve handling. This collaboration exemplified the practical application of cutting-edge design tools in real-world engineering.



Fig. 4: Display at Autodesk

Ansys

During a visit by ANSYS executives to IIT Bombay, we demonstrated Matsya 7 performing a fully autonomous task in the pool. The session highlighted how advanced simulation tools are applied even at the student engineering level. It is a pleasure that student-led engineering efforts like ours often serve as touchpoints between academic research and industry practice, where ideas flow in both directions and practical problem-solving meets cutting-edge technology.



Fig. 5: Presentation to ANSYS executives

TechConnect 2024

TechConnect is an annual technical exposition at IIT Bombay, held during the winter, where research labs and technical teams of IIT Bombay present their work to the general public, from professors to school children. Matsya 6, having just returned from RoboSub 2024, we had the pleasure of presenting it to Dr. Samir V. Kamat, Chairperson of the Defense Research and Development Organisation (DRDO).



Fig. 6: AUV-IITB Info Booth

Tech & RnD Expo'22

AUV-IITB had the opportunity to display our vehicle, MATSYA 6 (TRL 8), at the Tech & RnD Expo'22, where all the tech teams from the institute came together to display their innovations. It was a brand-new and incredible experience, and many enquiring minds raised significant issues and offered insightful criticism.



Fig. 7: Exhibition at Tech & RnD Expo'22, IITB

InvenTiv R&D Expo'22, IIT Delhi

AUV-IITB exhibited the vehicle (TRL 8), MATSYA 4, at InvenTiv. We displayed our vehicle to the directors from all the IITs, officials from the Ministry of Home Affairs, leading industry experts from various domains such as Mahindra, IBM, Daimler, and new tech startup hubs like T Works and TIHAN, as well as the Indian Navy.

Oceans Conference & Exposition Chennai 2021

We presented our research paper, "Design of Battery Management System for an Autonomous Underwater Vehicle," at the Oceans Conference & Exposition Chennai 2021. This paper focuses on optimally using battery capacity and implementing essential protections.

Recognition & Interaction with Prime Minister

Notably, the Prime Minister of India, Shri. Narendra Modi interacted with Matsya 4 at IIT Bombay, underscoring the significance of our work.

Participation in MTS TECHSYM

In 2020, we participated in the MTS TECHSYM Students' Technical Symposium on Advances in Engineering and Technology at IIT Madras. This event provided an opportunity

to interact with professors and students nationwide who are dedicated to maritime technologies. Our poster presentation, which highlighted the advancements in Matsya, received a special mention, aiming to inspire other AUV teams in their endeavors.

Tech Expo at Abhiyantriki 2020

The team participated in the Tech Expo event of Abhiyantriki 2020, the Annual Technical Festival of KJ Somaiya College of Engineering, Mumbai. We presented the history of Matsya from 2011 to 2020 to a large number of technocrats, enthusiasts, and students. This expo had exhibits from major organizations like DRDO, BARC, IMD, and DAE.

INEST India 2020

AUV-IITB was invited to present a research paper at the prestigious International Conference INEST India 2020, INS Shivaji, Lonavala, before the Chief of Navy and international marine specialists. Unfortunately, the event was called off due to COVID-related circumstances.

-B. Community Engagement

The Matsya101 Instagram Series

We launched the Matsya101 Instagram series as a creative outreach initiative aimed at making our work more accessible and engaging. This series was designed to break down complex concepts related to our AUV, Matsya, into simple, easy-to-understand explanations. We used fun visuals and approachable language, and we were able to communicate the functionality and significance of components in an educational yet entertaining manner. Matsya101 highlighted the technical aspects of our AUV and served as a valuable tool to spark curiosity and interest in underwater robotics among students and tech enthusiasts alike.

Student Workshop

We welcomed schoolchildren 2nd to 8th standard for a 2-hour session on March 5, 2023. The children were introduced to the world of robotics in a fun and easy-to-understand way through an interactive session, where the mechanical subdivision guided

them in building a simple gripper. They also learned how underwater robots like AUVs can move, see, and do tasks below the surface. Finally, they were taken for a lab visit to show a live demonstration of Matsya 6.



Fig. 8: Hands-on activity with gripper

Ek Bharat Shreshtha Bharat

We had the privilege to showcase the incredible world of underwater robotics and marine exploration to a group of young minds from Punjab as part of Ek Bharat Shreshtha Bharat. We displayed our vehicle, M6, at the pool.



Fig. 9: Talking to the group

-C. Competitions & Recognitions

Market Buzz - A Hull Cleaning Case Challenge

The Business Subdivision participated in ‘Market Buzz’ – A Hull Cleaning Case Challenge, organised during Techfest 2024 in collaboration with GAC India. The competition was focused on developing sustainable underwater hull cleaning solutions using ROVs at major Indian ports, which aligned with India’s vision for greener maritime operations. We

carried out a thorough feasibility study of using ROVs to clean the hulls in Indian port environments, taking into account important factors like economic viability, port safety procedures, and environmental regulations. We put forth a scalable business and deployment model with a focus on operational effectiveness, cost-effectiveness, and sustainability. We placed second amongst national finalists for our strategic solution. This accomplishment demonstrates our dedication to using technical expertise to solve practical problems.

IEEE OES Young Researchers’ Prize

AUV-IITB is the recipient of the prestigious Young Researchers’ Prize awarded by IEEE OES (Ocean Engineering Society) at the Underwater Technology Competition 2021, organized by the University of Tokyo, Japan. We presented a 15-minute-long video highlighting our journey so far, including the development of six underwater vehicles and various research projects the team has undertaken over the years.

Janes Feature



Fig. 10: Article published in the Janes Magazine

The research and development of Matsya 6C got featured in Janes, an international-level defense-related magazine. AUV-IITB is amongst the first student teams from India to be recognized at this level.