System for Autonomous Marine Underwater Detection and Research Activities

Introduction

SAMUDRA is an Autonomous Underwater Vehicle (AUV) developed by a team of undergraduate students from AIACTR (formerly Ambedkar Institute of Technology) to compete in the NIOT's SAVe Competition organized by the AUVSI Foundation.

SAMUDRA is based on the principle low cost and high efficiency. Technologically we have discarded the concept of the use of single board computer and embraced the idea of high performing microprocessors. SAMUDRA is designed for deep sea exploration, navigation at very high speed and accuracy. The vehicle has six thrusters design which enhances its maneuverability. The microprocessor being used here is INTEL i3 with Gigabyte H81-MS motherboard and the operating system being used is Linux. The embedded processor system allows us the flexibility to have very high speed algorithms at low power consumption. Also the system is equipped with vision with on board image processing in OpenCV and also the system is capable to perform the path detection, obstacle avoidance and target identification activities. The vehicle will also be equipped with acoustic system which can accurately identify and enhance the acoustic signal received underwater and process it. For the navigation, it will be equipped with compass and Sparkfun IMU. The whole system has been divided into mechanical, electronics, programming and computer vision. The other sensors onboard include pressure sensor and magnetomter.

Highlights of the project

- One of the **few teams working on AUV in India**.
- Has been ranked **among the top five teams** to develop an AUV by the NIOT, Ministry of Earth Sciences and **Government of India**.
- Cheap and **incubation period of only two months**.

Why AUV??

- Deep Sea Research Activities.
- Deep Sea Rescue Operations.
- Underwater Mine Surveys.
- Ocean Floor Mapping.
- Oil and Natural Gas Explorations.
- Defense.
- Other Commercial Uses…