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E90 Topic Selection
Advisor: Professor Bruce Maxwell
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We propose to design and construct a Remotely Operated Vehicle (ROV) for use in an underwater robot competition such as the one hosted by the Marine Advanced Technology Education (MATE) Center¹ or the Association for Unmanned Vehicles International (AUVSI).² The ROV will be designed to accomplish the tasks specified by the competition. While the rules and tasks for the 2005 competitions have not yet been released, the logs and papers from last year's ROVs are available for guidance. We have contacted the Marine Technology Society for further information on their upcoming competitions.

This project is motivated by our interests and summer internship experience in ocean engineering. Maila and Samantha both plan to pursue ocean engineering in graduate school.

This project integrates the electrical, computer, and mechanical engineering classes we have taken at Swarthmore. Samantha's classes and summer work experience will aid in the navigation system, sensor design, communications and sample collection, and in the implementation of an on-board computer for controlling various components. Maila's experience with control theory and digital logic will be applied in the propulsion system and possibly in maneuvering a robotic arm for sample collection. Fluid mechanics and pressure hull design will also be involved.

Although the ROV components that will be needed will depend upon the design, a tentative list includes small DC motors, propellers, a watertight pressure housing (such as PVC piping or an Otter Box), wiring for the tether (communications method to be determined), power source (most likely supplied through the tether), watertight electronics connectors, and electrical components such as a depth sensor and central processing unit. We are considering using LabVIEW for interfacing simulation and HyperTerminal or PCPlus for communications testing.

Our next task will be officially selecting a competition and following up on contacts.

¹ <http://www.marinetech.org/rov_competition/index.php>

² <<http://www.auvsi.org/competitions/water.cfm>>.