

WOMEN IN TECHNOLOGY SOLAR POWERED BOAT

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Abstract

The School of Science and Technology's Women in Tech group will be competing in the Sacramento Municipal Utility District's (SMUD) annual Solar Regatta Competition at Rancho Seco Recreational Area on May 4. The day of the event we are judged on a Slalom, Sprint, and Endurance Race against other universities. Improvements from last year's boat include a new steering mechanism and control panel, which contains the power switch, a safety kill switch, and a mechanism to control the boat speed. The steering mechanism contains a rope connected to a steering wheel and the motor through a pulley system. We modified wiring of the kill switch from last year's design of a foot press, to be attached to the driver's lifejacket. We learned team building skills, communication skills, developed new technical skills, and formed a camaraderie among this co-ed team. We hope our boat performs well and hopefully wins competitions. This will help our team get grants to improve our boat for the years to come.

Materials

- Canoe
- Solar Panels
- Control Panel
- Steering Mechanism
- Orion 24/12-40A DC-DC converter
- Minn Kota Endura Trolling Motor
- Duracell Ultra Deep Cycle Marine 12V battery with 14A



Improvements

Improvements that we have made on the boat are a new steering mechanism and control panel. The steering mechanism was originally a rope and pulley system. We had the rope connected to the steering wheel and pipe which the rope twisted around. The rope then went through metal eye loops which controlled which way the motor turned when you twisted the steering wheel. Now we have kept the original design of the steering wheel, but made the actual steering wheel pipe bigger so one does not need to turn the wheel as much and made the rope system easier to put together and take apart.

The control panel we used last year was made from a plastic container which then had all the wires in it that controlled the power and speed system and also the kill switch. The new design now is made from a metal box that has all the same controls in it. We took these controls and made them more organized in the box and labeled them all in case something goes wrong, which will make it easier to fix.

Design

The two solar panels are connected to each other and to the voltage regulator. The positive lead of the regulator connects to three switches, which then gets connected to the motor control switch. The negative lead of regulator connects the negative of the battery and to the circuit breaker. The circuit breaker connects to the motor control switch, which connects to the motor. Then we added a kill switch which connects to the motor.

