I. Abstract
I will be doing the IEEE Hardware contest. The contest requirements are to build a robot that runs entirely off of solar that can go around a track through obstacles. No batteries or fuel can be used. The robot cannot be taller the 16” but needs to also be small than 8” x 8” to fit through obstacles. I plan to have Professor Mitchell as my sponsor.

II. Statement of need
a. A robot must be constructed that requires no batteries or fuel. It was harvest all electrical power needed from solar cells. It must al so be able to fit under an 8” tall obstacle and or through an 8” wide obstacle and over a ramp to earn points.
b. Many companies are investing lots of money into solar energy research.
c. Alternative power generation from renewable resources is a hot and important topic that could affect how people live 20 years from now. Being able to design different devices to run completely off of solar is very important.

III. Work Done to Date by Others
Today lots of things are run solely off of solar power. These include houses, villages, traffic lights, and cars.

IV. Statement of Proposed Work
a. Design and construct a robot that will place within the top 6 at the competition
b. First a means of capturing solar energy and storing it must be designed. This needs to be more than enough to run the robot at least one time around the track. This needs to be done so while keeping the size restrictions in mind. Next the robot needs to know where to go around the track to complete the obstacles.
c. I plan to use 3 6” x 15’ solar modules rated at 15 V and 100 mA. I plan to have two on spring loaded hinges so they will fold in when the need to fir through an obstacle. A low power microcontroller will need to be used to save of energy consumption. Only one motor will be used to drive the vehicle and a smaller motor will be used to steer it. I will also try different approaches at trying to maneuver through different obstacles. I want to be able to gain the maximum amount of points but not waste too much time and energy doing so.
d. I will need a computer for programming. A room that will house a 10’ x 10’ tack is also needed as well as multimeters, power supplies, and scopes.

V. Schedule and Milestone Events
I hope to have the track completed by the beginning of the fall semester. The robot needs to be fully designed and tested by the end of fall semester to allow time for debugging. All components must be functioning together by February so final modifications can be made.

VI. Cost and Manpower Requirements
a. Solar cell cost about $30 a piece. The microcontroller should be no more than $100. The capacitor bank for power storage will need to be pretty large; I plan to spend $200 - $400 designing this. As for other parts I plan another $500.
b. Around $300 for hotel
c. 200+
d. There should be no reoccurring costs