IEEE Robot Design Proposal

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Design Project Proposal

Submitted to:

Mr. Wyatt

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# Executive Summary

Every year the Region 3 IEEE chapter hosts a conference for Computer Scientists, Electrical, and Computer Engineering professionals. This conference is known as IEEE SoutheastCon. As stated on the IEEE Region 3 website, “[SoutheastCon] *brings together Computer Scientists, Electrical, and Computer Engineering professionals, faculty and students to share the latest information through technical sessions, tutorials, and exhibits*.” One of the more popular events at SoutheastCon is the Student Hardware Competition, also known as the Robot Competition. SoutheastCon’s Robot Competition allows teams of students from schools in the Region 3 area to compete with one another, not for cash prizes but for team and school recognition. Winners of this competition receive international acclaim from the media, industry, and other professional organizations.

This team proposes to represent the University of Memphis at the 2016 IEEE SoutheastCon Student Hardware competition.

**Description**

The objective of the competition is to build an autonomous robot which picks up objects from a multi-tiered stage, identifies them, and then delivers them to different drop off locations based on their identifying characteristics. Different objects have different point values associated with them. Points are accumulated by delivering these objects to their correct destinations. Qualifying teams compete in three 5 minute rounds. The team with the most points after 5 minutes wins the round. After all three rounds are complete, the team with the most points wins the competition.

Our team’s objective is to compete against other engineering schools to secure a high ranking amongst them (we are aiming for 1st place). A high ranking will bring positive attention to the University of Memphis, The Herff College of Engineering, and to the robot team. If a respectable ranking is achieved, the attention associated with it will help the University of Memphis recruit more talented engineering students; could make it easier for the University to win related research grants, and will elevate the University’s engineering school’s status amongst its peers. This attention could also help members of the team to secure meaningful employment after graduation.

**Background**

This competition involves a number of technical challenges which span many different technological areas: Automation, Computer Vision, Dead Reckoning, Sensor Integration, Embedded Systems, Power Management, Programming, and many others. The team has been preparing for this competition since it was announced in the Spring (April 2015). Research has been done in many of the technological areas listed above and a general design has been established along with some completed detail design as well as some working subsystem prototypes.

Finally, as this is an annual competition, The University of Memphis has had competing teams in the past and there are some resources left over from prior efforts which have been made available to the current team – primarily hardware components and general competition experience. The team also has two machine shops and several 3D printers at our disposal.

The team feels that, given adequate funding, we have the resources needed to successfully compete in this year’s Robot Competition.

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# Deliverables

Ultimately, the team will be competing in the Robot Competition with a functioning robot designed and built by the team. This robot will meet the requirements specified in the official rules and will be designed to accumulate as many points as possible in the allotted time. A URL to the official rules is provided in the reference section below.

In addition to the completed robot and participation in the competition, the team will provide the following items:

1. Requirements Specification
2. Detail Design Specification
3. System and Integration Test Results
4. Dossier
5. Meeting Minutes

Accepted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Faculty Sponsor

Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**References**

1. IEEE Region 3’s website:

<http://ewh.ieee.org/reg/3/>

1. 2016 IEEE SoutheastCon website:

[http://sites.ieee.org/southeastcon2016/](http://sites.ieee.org/southeastcon2016/student-program/)

1. 2016 IEEE SoutheastCon Student Program’s Hardware Competition’s official rules:

<https://goo.gl/u7nK5g>