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Wireless Smart Kart Engineering Project

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I am looking for a student that has the motivation, determination, and fundamental lab skills needed to make a meaningful contribution to the ECE Wireless Smart Kart project. Women and minority students are encouraged to apply. I have participated RCEU program previously.

Project Summary:

The ECE Smart Kart is an electric wirelessly controlled kart developed by electrical engineering senior design teams over several semesters. The project started in the fall 2012 term and is used as an outreach tool at events such as university open houses and engineering summer camp to name few. From its beginning the kart had completely wirelessly controlled mechanisms but required an operator to be sitting in the vehicle. By wirelessly controlled mechanisms I mean there are no physical connections between the steering wheel and tires, the accelerator pedal and drive motor, or the brake pedal and mechanical braking system. The control information entered at the steering wheel or drive pedal is wirelessly transmitted to the physical controls. The wireless network and machine control protocol is implemented with SNAP modules which were donated by a local company Synapse Wireless. The rest of the hardware was purchased through grants provide by TVA, Northrop Grumman, and others. In the summer of 2014, with a grant provided through the RECU program, remote control of the Kart via a computer was established. The student chosen for the summer 2017 will first be tasked with learning the operations of the SNAP systems including the Portal program and Python programming language. Next the student will refine the set of computer programs that establish remote monitoring and control, via a computer, of the Karts systems.

The long range goal is to have a kart that will navigate from point A to point B based on user input via a smart phone. Therefor the students next task will be to create and implement a smart phone app that establishes remote monitoring and control of the Karts systems. The student will learn about basic machine control, wireless communications, Python programing language, and smartphone application development.

Student Prerequisites:

The ideal candidate should have a basic understanding of electrical circuits and computer programming.

Student Duties:

As stated in the project summary the student will be creating a set of smartphone apps that will allow remote monitoring and control, via a computer, of the Smart Kart's systems. In order to create the programs first he will have to learn about the kart's mechanical components and wireless control devices. In addition the student will have to learn the Portal software and the Python programming language. This project will allow a student to connect the physical world and computer programming together through machine control. This is an excellent opportunity for a young engineer or scientist to develop new programming skills and hardware/software interfacing techniques that will be valuable to their education and career choice.

Mentor Supervision and Interaction:

I am calendar year faculty and will be at UAH for the entire summer. The student chosen will be working with me at my office or in the Smart Kart lab in the Engineering Building. The student will be supervised and reporting to me the entire duration of the project. We will plan one meeting daily to discuss the previous day's progress and the current day's goals. A detailed plan of target dates and milestones will be developed by the student and I at our first meeting. We will also use the daily meetings to address new challenges as needed. I plan on asking the student to give two formal presentations on the project and his progress which will be attended by me and other faculty in the department.