Electrical and Computer Engineering Outreach Team Funding Proposal: Electric Go-Kart Project

Colorado State University

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Introduction

The Electrical and Computer Engineering (ECE) Outreach team from Colorado State University (CSU) is a dedicated group of students who work to raise awareness, understanding, and interest in ECE topics through various demonstrations, lessons, and workshops. Working with middle and high schools in northern Colorado, ECE Outreach uses informative and entertaining projects to introduce students to the STEM field, hoping to foster a greater enthusiasm for engineering.

Project Summary

The ECE outreach team is working on the continuation of last years Electric Go-Kart. Already equipped with purely electric motors and an embedded control system, this years team plans on further implementing aspects of what modern electric vehicles are capable of in an effort to educate and entice students about the field of Engineering.

Our senior design team this year consists of four electrical and two computer engineering students. Although we will not be working with any mechanical engineering students this year, we plan on fully taking advantage of the already made and working Go-Kart and adding items that will take this further into the realm of an automated vehicle. As of now, the team is planning on moving to a Linux based operating system allowing us to implement better data logging and enabling us to look into designing assisted driving mechanisms. This would include looking into the use of ultrasonic sensors and eventually lidar sensors as well as mechanisms to help aid with steering. To help seek further interest in our team, we also plan on diving into solar panel charging both on our prototype car and the larger Go-Kart.

Along with gaining and furthering our skills in design , the team this year will also be gaining skills in effective team working, leadership, teaching, and risk management.

Future Prospects

Following the completion of the above, we will be adding in many other features, including but not limited to, underglow LEDs, addressable brake lights, GUI allowing students to interact with our lights, design of PCB boards for solar panel charging, FPGA design.

Lessons plans we plan to implement:

- Basic understanding of power laws
    - how does charging work?
- C coding with Raspberry Pi
- Sensor interfacing with Raspberry Pi
    - Using UART, I2C, CAN

Funding

We are asking for sponsors for the ECE Outreach team's go-kart project. The estimated budget is outlined below. This is itemized to represent our needs and goals for the project this year and all budget will be put towards the betterment of the vehicle.

Description	Member	Purchased	Quantity	Projected
Initial				
Raspberry Pi 4B 4gb	Ryan		1	$55.00
ROCKPro64 4gb	Ryan		1	$79.99
ROCKPro64 20mm Mid Profile Heatsink	Ryan		1	$3.29
ROCKPro64 12V 3A US Power Supply	Ryan		1	$8.99
2-pack 32gb class 10 microSD cards	Ryan		1	$15.99

RPi4B Aluminum Heatsink Pack	Ryan		1	$1.95
3ft Micro-HDMI to HDMI cable	Ryan		1	$3.95
HDMI cable	Ryan		1	$2.45
Raspberry Pi 7” touchscreen display	Ryan		1	$64.95
Raspberry Pi 15W power supply	Ryan		1	$9.99