**STEAM Expo &****Board of Directors Student Showcase  
 Autonomous Vehicle Project Proposal**

**Information Technologies Department**

**Stanton Campus**

This proposal request is for hardware purchases that will be used to develop and create an autonomous vehicle. This is project is a student-based project that will be used for the student's capstone course assignments and also to showcase at the STEM Expo and at the Board of Directors Student Showcase presentation next spring 2020 semester.

The autonomous vehicle with be customized and programmed by our students using the Python programming language and machine learning programming to provide the vehicle artificial intelligence. The overall programming goal for this vehicle will allow the vehicle (through an attached camera) to learn how to stay on a track (or road) and to be able to identify speed signs, stops signs, and if there is a pedestrian in a crosswalk or in the road. The students will also setup and configure a proximity sensor attached to the vehicle to make the vehicle stop before it crashes. The students will also a crash sensor to identify if the vehicle itself has been involved in an accident. We are able to help cut costs by reusing controller boards from previous grants and courses as well as the proximity and crash sensors. Below is a rough draft of the project timeline and as well as the budget request.

**Project Timeline**

**January**

Stage 1: Attain parts

Stage 2: Assemble top plate and roll cage

Stage 3: Connect servo shield to Raspberry Pi

Stage 4: Attach Raspberry Pi to bottom plate

Stage 5: Attach camera

Stage 6: Put all the pieces together

**February**

Stage 7: Now we get to the fun / hard part install the software

Stage 7a: Install on PC Stage

7b: install on car Stage

7c: configure settings and build the project

Stage 8: Calibrating Stage

8a: steering Stage

8b: throttle Stage

8c: fine tuning

Stage 9: Driving

Stage 10: Training autopilot

Stage 11: Training on the simulator

**March**Present at the STEM Expo and the AAA Presentation

**Budget Request:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hardware** | **Prices** | **Qty.** | **Total** | **Purchase Links** |
| **Donkey Partial Kit** | $125.00 | 1 | $125.00 | [Click Here for Link](https://store.donkeycar.com/collections/frontpage/products/premium-1-10-scale-donkey-car-with-sombrero) |
| **Exceed Magnet, Desert Monster, Blaze, or Short Course Truck** | $100.00 | 1 | $100.00 | [Click Here for Link](https://www.amazon.com/Exceed-Racing-Desert-Course-2-4ghz/dp/9269802086/ref=sr_1_fkmr1_2?keywords=Exceed+Magnet%2C+Desert+truck&qid=1573589955&s=electronics&sr=8-2-fkmr1) |
| **Painters tape (Multi color)** | $17.95 | 2 | $35.90 | [Click Here for Link](https://www.amazon.com/Colored-Masking-Tape-6-PACK-Variety/dp/B0741S21B3/ref=sxin_2_af-pna-1_598525940bbfc501a38159f8507bad8cd9414c95?keywords=painters+tape&pd_rd_i=B0741S21B3&pd_rd_r=dccc2a66-450e-457c-8a44-58ae7bb08c1b&pd_rd_w=jzgS6&pd_rd_wg=ZwPMD&pf_rd_p=3892bc23-5fa8-4a18-8855-22c23bd2e202&pf_rd_r=TPHM4N5VFJM8BHAHKCAT&qid=1573753080&s=electronics) |
| **MicroSD Card** | $12.84 | 1 | $12.84 | [Click Here for Link](https://amazon.com/gp/product/B01HU3Q6F2) |
| **USB Battery with microUSB cable** | $17.00 | 1 | $17.00 | [Click Here for Link](https://www.amazon.com/Upgraded-Anker-Candy-Bar-High-Speed-Technology/dp/B06XS9RMWS/ref=as_li_ss_tl?s=electronics&ie=UTF8&qid=1521559608&sr=1-1-spons&keywords=anker+battery+astro&psc=1&linkCode=sl1&tag=donkeycar-20&linkId=0a20dfc33b7fbc89e300774130323541) |
| **Remote Controller (Configuring and testing)** | $13.00 | 1 | $13.00 | [Click Here for Link](https://www.amazon.com/QUMOX-Bluetooth-Gamepad-Joystick-Controller/dp/B01LX5UTSL/ref=sr_1_7?crid=1NZERFBJLWWH0&keywords=wireless+controller+raspberry+pi&qid=1574369390&sprefix=wireless+controler+ras%2Caps%2C239&sr=8-7) |
| **Micro SD reader** | $8.99 | 1 | $8.99 | [Click Here for Link](https://www.amazon.com/dp/B07L6CX4S2/ref=cm_sw_em_r_mt_dp_U_TmE3DbBN001P5) |
| ***Total*** | | | ***$312.73*** |  |