EngiNerds: Autonomous Robot

Objective
As the obstacles become more challenging our robot will be able to perform successfully through the different courses. Our mission is to successfully achieve all the obstacles while maintaining our robot in one piece as it performs favorably while meeting explicit and implicit requirements.

Design Evolution

Phases:

Phase 1:
- Brainstormed ideas on how we wanted our robot to be presented
- Determined how lack of previous experience would be beneficial/disadvantage to completing this challenge
- Evaluated the advantages of motors and sensors that would come with having unique 3-D printed wheels

Phase 2:
- Made sketches of what we wanted our design to look like
- Developed prototypes to determine different performance based on material and weight distribution
- Built a 3-D model of what our robot would look like based on the coalition of all our minds
- Examined pros and cons of the current design

Phase 3:
- After having a process of elimination we began to construct towards our final result
- Printed all our 3-D wheels keeping in mind height, weight, and amount of traction performance in sand
- Code development began after studying how our robot was expected to perform
- Construct our unique suspension with PVS, laminate/metal locker material, wires, and screws
- Incorporated hubs into our 3-D printed wheels and assured secureness of these to our suspension

Phase 4:
- Incorporate all physical components
- Included unique designs to our robot
- Begin testing on different types of terrain
- Perform finishing touched to our robot as well as code structure

Phase 5:
- Robotics challenge at the sand dunes!

Requirements:
- Budget: < $250
- Locate and navigate to a beacon
- Travel in an autonomous matter while detecting obstacles
- Navigate with the use of a compass
- Weight < 4 kg

Overall Outcome:
- Were able to overcome barriers on our way to developing a successful robot
- Worked as a team by providing support to one another by never giving up during hard times
- Even though we were unable to communicate with the beacon, we were able to travel towards it with the use of a compass
- Suspension performed as designed providing strength and flexibility to the rest of the robot when overcoming obstacles

Team:
From left to right:
- Henry Reyes
- Joseph Harrell
- Ruby Martinez Gomez
- Aminah Abushahma