Hexapod Robot

submitted by Ericka Begody
Summer Intern 2016
Electrical Engineering Student – Navajo Technical University

The project I am working on at NASA-Johnson Space Center in Houston, TX is a hexapod robot. This project was started by various engineers at the Trick Lab. The goal of this project is to have the hexapod track a yellow ball or possibly another object from left to right and up/down. The purpose is to have it track an object like a real creature. The project will consist of using software and hardware. This project started with a hexapod robot which uses a senor bar to track a yellow ball but with a limited field of vision. The sensor bar acts as the robots "head." Two servos will be added to the hexapod to create flexion and extension of the head. The neck and head servos will have to be programmed to be added to the original memory map of the existing servos. I will be using preexisting code. The main programming language that will be used to add to the preexisting code is C++. The trick modeling and simulation software will also be used in the process to improve its tracking and movement. This project will use a trial and error approach, basically seeing what works and what does not.

The first step is to initially understand how the hexapod works. To get a general understanding of how the hexapod maneuvers and plan on how to had a neck and head servo which works with the rest of the body. The second step would be configuring the head and neck servos with the leg servos. During this step, limits will be programmed specifically for the each servo. By doing this, the servo is limited to how far it can rotate both clockwise and counterclockwise and this is to prevent hardware damage.

The hexapod will have two modes in which it works in. The first mode will be if the sensor bar does not detect an object. If the object it is programmed to look for is not in its view it will automatically scan from left to right 3 times then up and down once. The second mode will be if the sensor bar does detect the object. In this mode the hexapod will track the object from left to right or up and down. The hexapod will eventually be able to track the object moving its head and body in sync with on another and being able to rotate its body at 360 degrees. This is the plans and possible end results for the hexapod robot I will be working on during my summer internship at NASA Johnson Space Center.

Since working on the hexapod project I have gained an increase interest in robotics. I enjoy the process of critical thinking. Also will working on this project I was challenged in a way that made more passionate to strive even more to become an engineer. I've learned that asking questions is an important part of the learning process. Also I learn that much more is accomplished when teamwork is applied.