Individual Lab Report 02

Songjie Zhong

16-681 MRSD Project

Team B: Space Robot

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Individual Progress

During this week, I found that a kind of material named V10 that can be used as gecko material for our robot after talking with Prof Metin Sitti. I ordered them through Smooth-on Inc and we got the materials just this afternnon. And the next step for it, we will ask Metin for help about how to cast the shape we want for our robot.

And I created a leg of SolidWorks model for our robot (See figure 1). The leg includes three AX12-DINAMIXEL servo motors in order for three DOFs. I also created every component of this leg to 2D engineering drawings and also saved as .stl files. The former one can be used for laser cutting and the latter one can be used for 3D printing.

Challenges/Issues

The main challenge for our group now is that we are still hesitating about our whole system design idea. For the original 6 legs or 4legs "lemur" like robot, we found that it has a limitation about the transition.

After few meetings with Dimi this week, we decided to rebuild our concept of the design for our whole robot system. Actually it will be looking like an inchworm and have two segments with 7 DOFs. So basically it can have one segment fixed and rotate another segment to finish the transition.

For the servo motors part, I found a good one named AX-12a servo motor. It seems more suitable for the assembly of the robot body because it comes with a set of convenient brackets.

Nate and Dipta will compare this servo motor with the original HS-546MH and then decide for our robot.

Cross-reference/Teamwork

During this week, Brian has updated our website for the recently progress of our MRSD project. And he also improved the system GUI with more detail and intelligent functions. Nate and Dipta finished majority job of our conceptual design and draft schematic for our PCB distribution task10. And Nate has also ordered some necessary parts for our project, like ArduinoDue, Power supply, Servo Motors and So on.

Dipta made the trade study for different kinds of servo motors and chose the most suitable one for our project. And also he finished the work breakdown structure for our whole electrical part of the robot.

I was mainly charged for finding the resources to get our gecko material. Finally, we found Smooth-on Inc where we can buy V10 for our roughly experiment designed for next step. And also I created a 3D model with SolidWorks. This leg included the details about 3 servo motors and 3 degrees, also the design for the foot that can attach our gecko material.

Plans/Future Work

We have met with Dimi yesterday to discuss our whole system mechanical structure. And there came a good idea for our project like an inchworm. And we will discuss with him again this afternoon. Nate and I will flesh out this new inchworm concept for the design of our robot for the coming week. At the same time we are still considering and hesitating our whole mechanical structure, Dipta and I can still cast the V10 material for the shape we want for our design of the robot to see whether it works well or not.

Also I will together with my group to think more detail about our new idea of our mechanical system structure. And we will decide the idea and go deep with it as soon as possible.

Figures

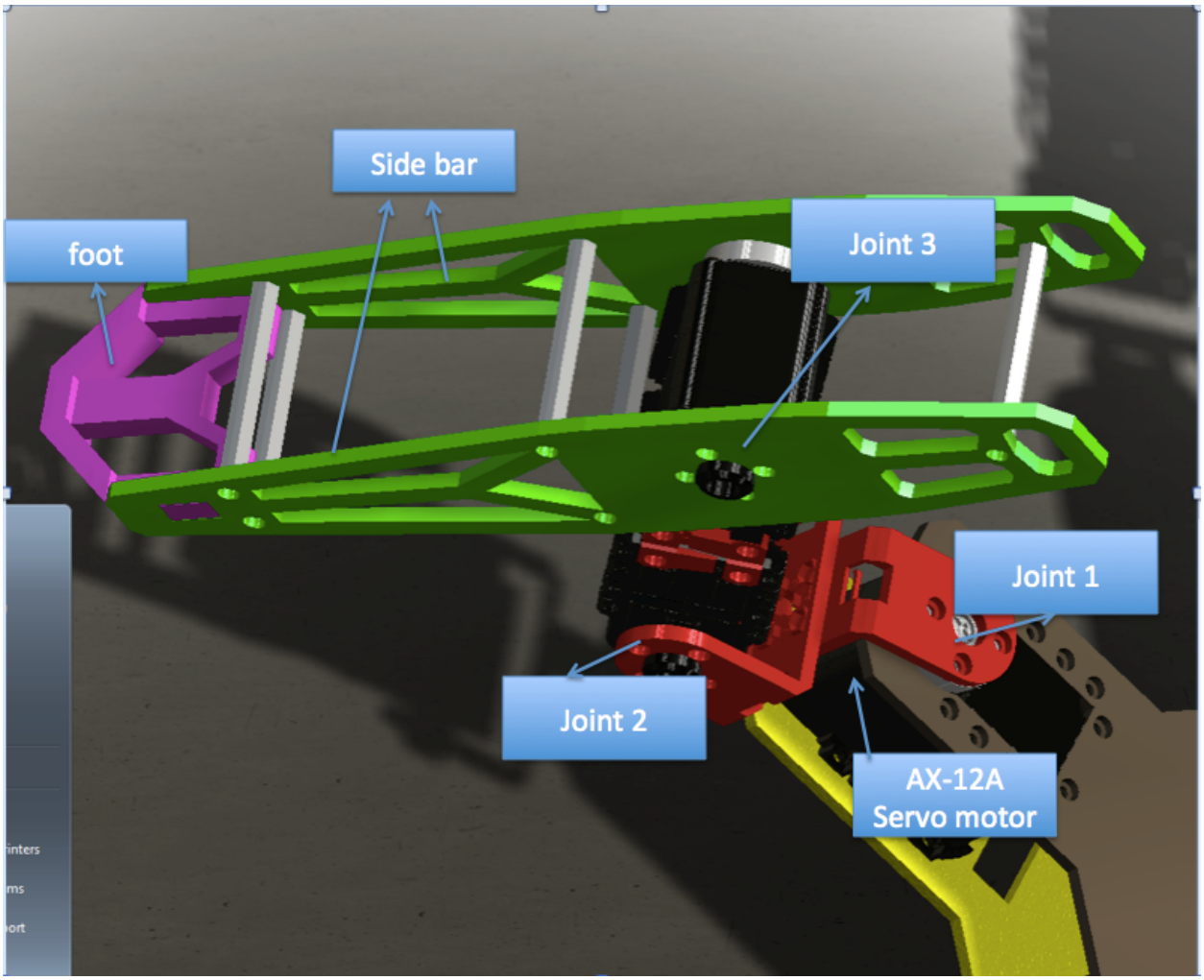

Figure1: leg 3D model 1