

Voice Controlled Robotic Hand

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I. CHECK OUT A REPOSITORY:

Since my project partner Lily is new to version control and Git specifically, we walked her through creating a new Git repository. For simplicity sake, we used the GitHub App to create the repository named Robot-Arm at <https://sithub.com/shanqli/Robot-Arm>. I then had her add Chance and I as contributors to the master branch of the Robot-Arm project. I then checked out a branch via the github website and cloned it to my local drive.

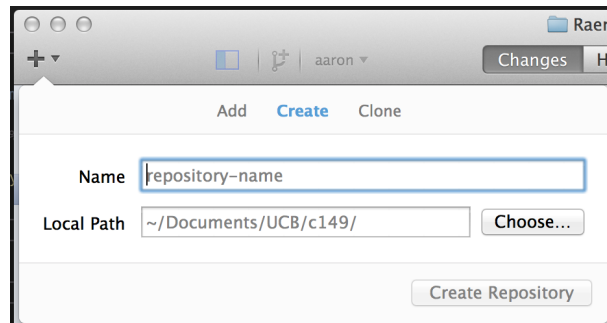


Figure 1: Creating a Repository

II. ADD FILES TO YOUR REPOSITORY:

First I had both Chance and Lily modify the readme on the repository. Then I walked them through merge conflicts when they had both modified the same file separately. I then modified the file and pushed it.

```
1 git add README.md
2 git commit -m "aarons update"
3 git push
```

III. PLAN YOUR PROJECT:

We then planned our project. Our plan is to use the mbed FRMD KL25Z from Freescale as the processor core driving servos (either GM995 servos or the Bioloids from the stock in 204 Cory or servos from the Invention Lab supply) installed in a 3d printed robotic hand. The first step in the project will be to design a robotic hand that can be 3d printed and assemble it with the mbed system. One possible candidate for the design is InMoov (<http://www.thingiverse.com/thing:17773>). The first goal will be to get the hand to perform a preset sequence of gestures. Secondly we will integrate a EasyVR Shield 2.0 - Voice Recognition Shield to the platform. Combining these two systems will enable us to voice control the robotic hand. Time permitting, we plan to build and program an electromyogram which can be added as an additional sensor to the system, where we will detect potential from muscle movement and thus command the robotic hand.

SET MILESTONES AND A SCHEDULE:

- October 21: Project charter
- October 29: 3D printing robotic hand parts. Choice of platform finalized after discussion with GSIs. Order supplies.
- November 5: Assembled 3D printing hands parts. Trials on motor and sensors.
- November 12: Statecharts simulation model on platforms.
- November 19: Mini project update: Demonstrate sensor and servo action.
- November 26: Measured sensor accuracy, modify simulation model.
- December 3: Actuation in response to voice sensors.
- December 10: System testing.
- December 16: Demonstration video made, powerpoint prepared.

- December 17: Final presentation and demo.
- December 19: Project report and video turned in.

IV. SET A WORK BREAKDOWN STRUCTURE:

	10/21	10/21-10/28	10/28-11/4	11/4-11/11	11/11-11/18	11/18-11/25	11/25-12/2	12/2-12/9	12/9-12/16	12/16-12/19
i. Design										
Choose sensors and foundation	Aaron Chance Shang-Li									
Order parts		Aaron								
Design for hardware		Shang-Li	Shang-Li	Shang-Li						
ii. Development										
Sensor testing			Aaron, Chance	Aaron, Chance						
Build model		Aaron, Chance	Aaron, Chance	Aaron, Chance	Aaron, Chance					
3D printing hardware			Shang-Li	Shang-Li	Shang-Li					
Assembly				Shang-Li	Shang-Li					
iii. Debugging										
Debug					Aaron, Chance, Shang-Li	Aaron, Chance, Shang-Li	Aaron, Chance, Shang-Li	Aaron, Chance, Shang-Li	Aaron, Chance, Shang-Li	
iv. Other tasks										
Project Charter	Chance									
Midterm		10/30						12/4		
Project Mini Update					Aaron, Chance, Shang-Li					
Project Milestone Update Report						Aaron, Chance, Shang-Li				
Finalize Project									12/12	
Project Report 12/19									Aaron, Shang-Li	Aaron, Shang-Li
Project Presentation 12/17									Aaron, Chance, Shang-Li	Aaron, Chance, Shang-Li

Figure 1: Work Breakdown Structure

V. INDIVIDUAL WRITEUP:

The critical path of the WBS extends from the procurement of the needed materials to the project report which is about a month and a half. For the design phase we've schedule two weeks. Development we've overlapped some of our design phase and we have 2 weeks scheduled for that aslo. Debugging gets most of our time with three weeks. To combat any delays, we will schedule the completion of the actual system a week before the project due date. No mentors have been chosen yet but on our next meeting we will discuss this possibility.

VI. FEEDBACK:

I noticed that you are using subversion in the lab, and that this is now going out of style and most places in industry now are moving to Git. It would be nice to see this as the default version control system for the future.