

For the repurposed capstone, I will still be working on the OpenPose classification for gestures. Because the work I am doing with software, I am not restricted to any hardware constraints, and thus I can continue the work I was doing even before the restructuring of Capstone. I am currently in the process of collecting more data. I have about 20 samples of data for the 7 major gestures, and have to yet collect data for the alphabet gestures. There is a big bottleneck in collecting the gestures, as OpenPose will segfault if I feed in more than 50 images at once, so I have to monitor OpenPose tracking for each 50 images (which takes about 30 minutes on my CPU) and have to continue this cycle. As such, I can't train a whole batch of images at night, because I have to do it in intervals of 30. However, because I've finished the normalization of the data such that each hand is relative in size now, I just need to finish the data collection and model making. I am thinking of trying two methods of neural networks to train my data. The first is to use a pre-trained model that helps me fine tune my training, and the other is to build a model from scratch. Building a model from scratch is hard because it needs a lot of data to fine tune the weight parameters and to make the model generalize well enough, so I want to see how good building the model from scratch can be by comparing the two models. Our group plans on asking people for help on Facebook Groups, so I think we can get enough responses to actually make a model from scratch. As such, the next two weeks will be me making the classification model with the neural network, and making sure that our group has enough data to work with.

The risk factor that we have with our project is that OpenPose requires a very specific image to actually classify the joints. This requires that we need to have these gestures in a background that is clear (which is mentioned in our requirements). However, the camera we were supposed to use has a higher quality camera than any of our phones/laptop webcams. As such, the quality of our videos and therefore our frames will not be as high of quality as the hardware camera. This means that there is more risk of OpenPose not being able to classify the images properly because of the lowered quality. This means that we should instead have multiple frames being used and choose the best one that can be classified.

TASK TITLE	START DATE	DUE DATE	WEEK 03/23/20	WEEK 03/30/20	WEEK 04/06/20	WEEK 04/13/20
OpenPose						
Collecting Data	3/23/2020	3/30/20	█	█		
Finding Examples of Pre-trained Neural Network	3/30/2020	4/1/20		█		
Working with Pre-trained Neural Network with gestures	4/1/2020	4/6/20		█	█	
Making Neural Network from scratch without Pre-trained Neural Network	4/1/2020	4/6/20		█	█	
Optimization	4/6/2020	4/9/20			█	█
Writing frame dividing script with backups	4/8/2020	4/11/20			█	█