Anush Gandra

Project Proposal

1) The problem I am trying to solve is depth perception using a camera. I want to color code different depths in an image. This is challenging because depth in each image is different (take for example a straight road vs a road that bends to the left and up).
2) This is a cool problem to work on because it has a lot of applications in the filed of autonomous self - driving cars and generation of 3D maps. If depth can be known accurately, we can maybe construct a realistic 3d rendering from a 2D image.
3) NYU depth V1 and depth V2 are datasets that can be used to train the model. I am going to focus only on images and not on videos. The data already exists here: https://cs.nyu.edu/~silberman/datasets/nyu_depth_v2.html
4) I am planning on using a CNN (mostly RCNN) for the job and see it performs.
5) I can make it cooler by integrating OpenCV with the trained model for live demos. If I have more time, I can include videos and do a live demo of me walking through a room and a color-coded depth perception output from the DL model like this: https://www.youtube.com/watch?v=KNft4RFsK28.

Rough Weekly timeline:

1) Nov 6th – Nov 15th : As I am doing HW3 I will read articles and other resources to understand RCNNs, doing the homework will also give me a deep understand of how they work. I will also download the test data set during this period.
2) Nov 15th – Nov 22nd: Try to implement the RCNNs code and fix any syntax errors.
3) Nov 22nd – Nov 29th : Write test cases for the model and make sure everything is working properly. If all goes smoothly, start training the model.
4) Nov 29th – Dec 5th: Training should be well on its way (if not completed). See the performance of the model and try to improve it. If I have more time I will try to combine OpenCV with the model for a real time demo.