Team SegFault Project Proposal

Our team has decided to choose Option A for our project, with our intent being the implementation of a machine learning paper. In the course of our research, we have identified three papers of interest.

1. “Generative and Discriminative Voxel Modeling with Convolutional Neural Networks”

A paper by Dr. Brock of Heriot-Watt University, this work develops a method to train voxel based autoencoders accompanied with a graphical user interface that allows for interpolation between differing objects. Convolutional neural networks are used to classify these objects.

2. “Pixel2Mesh: Generating 3D Mesh Models from Single RGB Images”

This work makes use of graph-based convolutional neural networks to represent 3D models as a complete mesh rather than the more standard volume or point clouds. This method produces 3D meshes with better quality and higher accuracy of detail when compared to contemporaneous methods.

3. “Unsupervised Generative 3D Shape Learning from Natural Images”

This work uses Generative Adversarial Networks to develop a method, supposedly the first, to learn in an unsupervised way 3D shapes from natural images. It accomplishes this by training the network with images of 3D objects taken from multiple viewpoints, forcing it to learn a viewpoint-independent representation.