**Project Proposal: Gesture Recognition Based on PyTorch**

**Team Members**: Runlin Hou, Sifan Yuan, Yuxiang Song, Haocong Wang

**Project Description:**

Gesture recognition is one of the vital topics of human-computer interaction. It can be widely utilized in applications, such as virtual reality and sign language. In our daily lives, we already contact with gesture recognition in a high frequency. For example, one of the commonly used electronic devices, iPad, supports gesture operation, which requires the ability of gesture recognition.

In this project, we plan to develop an algorithm that can finish recognizing several common gestures. This algorithm will be based on PyTorch, which is an open source machine learning library of Python.

There are already various data sets for gesture recognition. We choose two of them, Microsoft Kinect and Leap Motion as our training data. We also plan to collect some pictures that contain various gestures as the test data set, which can be downloaded from Internet or we can take pictures by ourselves.

For further details of implementation of the algorithm, currently we decide to design and implement it with an LeNet like CNN model. It will have 2 convolution layers and two full connect later. And the output would be 10 numbers that represented by each gesture. After implemented this simple model, we will try to construct a more complex model that can structure the position of five fingers, which depends on the time and complexity.

**Expectations:**

We expect our algorithm will be able to recognize some simple gestures, such as numbers from zero to nine, with high accuracy (>=90%). We also expect that our algorithm can finish single recognition with high speed after we finish the training of the neural network.