Hello, everyone. This Group N, My name is -, this is -, and this is -. So let’s start our demo.

**换页第二页**

Firstly, there are three main components to build our application. First one is CNN model, which is used in the software by Tenforflow Lite. The second one is the APP design, we use google material design library to build our application. The last one is the sever, which is supported by the Google Firebase, and user authenticate and history data are stored in it.

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Let’s move on to the model.

We use CNN network for classification, where there are 3 convolutional layers with 16, 32 and 64 filters respectively. The process of batch normalization, ReLU activation and max pooling is added to the layers, resulting in more than 70 thousand parameters, which we think is suitable for the dataset given in the course.

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This software has five main functions, which are motion detection, account login, history data showing, sitting reminder and falling warning. Firstly, Our application could classify 7 motions, which are Falling, Lying, Descending stairs, Climbing, Walking, Sitting, Running. Secondly, User login and the history data are based in the Firebase, data is stored as NoSQL JSON tree. Next, the application could monitor the user sitting time. When the user sit too long, a notification will be sent to warn. The user could customize the max sitting time. In order to test, the default is 10 seconds.

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Finally, we add a falling warning. When the application monitors the user falling, a dialog will be shown. The sser should click it within 10 second. Otherwise, this application will automatically call the emergency contact. The phone number can be customised and the default is mine.

All the data is stored in the server, such as max sitting time, emergency contact and history data. The user could access it in any phone.

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Next, we will talk about the performance.

The model has 94.4% accuracy in training set and 94% in test set.

The communication latency is 0-1.5 second. It doesn’t mean the sensor has 1.5-second latency to phone. It means that phone will update the detection every 1.5 sceond.

Every 10 mins, the application will consume 75.68 mAh battery and 7.89MB Cellular data. The overall RAM is 70MB and the ROM is 11.7MB. The CPU usage is less than 20%.

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Finally, this software has high accuracy, it could authenticate the user and store user data online. Falling warning is also a good function for the user when emergency occurs. Next, the user could customize the Max Sitting reminder time and Emergency Contact phone number at any time.

However, some functions still need to improve. Firstly, there are only 7 classes classified, so we should continue to extend the motion detection range. Next, the detection model is stored in the device instead of the cloud, so it is hard to update. Therefore, we will continue to working on moving the model to the cloud.

The next two slides are some screen shots and test videoes. If you are interested, we may show you! All the demoes are here, thank you very much.