Dear teachers and students. I’ m very glad to stand here today to give a brief introduction to my final year project. My name is GaoXiangyu and the title of my final year project is that *Tumor Detection in Brain MRI Images Based on the Improved U-Net.*

(1)According to the report of the authoritative medical journal ” The Lancet “, there were 330 000 cases of brain cancer and 227 000 related deaths worldwide.

Thus, Brain tumors have become one of the important diseases endangering human health.

(2)Because of its Highly fatality rate, Difficult to find and Easy to be misdiagnosed. So, it is particularly important to be able to use computer to assist doctors to identify and judge the location and size of brain tumors.

(3)And The project I wanted to do is to detect brain tumors. When you input a image with brain tumor into this system, it can output the size and location of the tumor as shown in the figure.

(4)In order to achieve this function, some researchers chose to use ANN(Artificial Neural Network) and FCN(Full Convolution Network) as networks for deep learning.

They are both deep learning networks. Due to time constraints, I will not go into details.

But these two networks also have problems. Because the ANN network needs to convert a two-dimensional image into a one-dimensional vector, the number of trainable parameters increases dramatically with the increase of image size. This leads to poor results. However, the results obtained by FCN are not precise enough, and the relationship between pixels is not fully considered, resulting in a lack of spatial consistency.

(5) Therefore, U-Net and U-Net based networks have emerged. U-Net is an improved network structure based on FCN. As it is excellent in using small data set training,simple and efficient. I choose it as my project' s network.

(6) After I configure the environment and setup parameters, I firstly chose a small dataset of funds vascular image to test the network.

(7) I successfully used the U-Net model and the U-Net++ model to detect the position of vascular. The effect is as Figure shows. We can see it can basically detect the fundus vascular. So, I have successfully verified these networks

After that, I tried to use the network to detect brain tumor images. The training process is very successful. After trained the network, I tried to use the network to detect the brain tumor. But It always reports many errors. So there must be some problems

in it.

(8) It is not perfect so far, or not even completely successful. So, in the future work, I will firstly solve the error in testing the brain image, then Try to improve it by adding some attention mechanism and so on. And after that, Try to improve accuracy and speed on this basis. These are my work of final year project in the first semester.

(9) And here are my references

(10) The remaining time is reserved for Q&A.