Abstract

This project is focused on the lung cancer detection ,which is also the competition of kaggle, based on convolution neural networks methods and other traditional classification methods based on features. One kind of CNN networks is introduced in the tutorial, called U-net, which is designed based on cell tracking challenge in 2015(U-net:Convolutional Network for Biomedical Image Segmentation, Olaf Ronneberger). U-net is a new method with high accuracy in cells tracking challenge in 2015. This project introduces this method which can confirm the places of candidate cancer cells. Based on the information of interested regions which contain the cancer nodules, our prediction accuracy will be improved.

Also the classification of {caner, no cancer}can be made by traditional classify method like: Forest Random and so on. first, we need to construct the features base on CT scan images for every patient. Then, for every patient we can make the supervised classification by created features. Based on the predicting results of classification method, this old version method can't give us a satisfied result. so, we choose the Convolutional neural network as a potential better method. U-net is just a new design of how to arrange the layers, which will be great for classify the cells and nodules. but other better design of layers can also be made by changing the convolution and looping schemes. These kind of designs don't have any particular rules that we can follow. but based on the different datasets, we need to reconstruct the layers to get a more fitful convolutional neural network model. As for this lung cancer dataset, how to change the layers and how to arrange the covolutional steps and looping steps will be a challenge for us.