

Abstract

This thesis is written in English and is seventy-one pages long, including five chapters, forty-two figures and four tables.

As often being said, “health is wealth”! The poor state of health which has drastically increase death rate across the world, and that my grandmother, paternal was the first to be killed with breast cancer in my home town has prompted my interest in this health-related topic. Cancer is a serious health issue and we have different types of cancer. For clarity and interest, I will be dealing with lung cancer and its early detection. Lung cancer is the second most common cancer in both men and women that afflicts 225,500 people a year in the United States. Nearly one out of four cancer deaths are from lung cancer, more than colon, breast, and prostate cancers combined. Early detection of the cancer can allow for early treatment which significantly increases the chances of survival. This project creates an algorithm that automatically detects candidate nodules and predicts the probability that the lung will be diagnosed with cancer within 1 year of the CT scans. This is being done by mere CT scan and CAD in a decade ago, but this thesis will be applying the knowledge of deep learning to achieve this and hence higher accuracy.

Keywords: Epoch, model, training, dataset, validation set, segmentation, deep learning, parameter free, CT images, lung nodules, LIDC, CAD