

UNIVERSITY OF SOUTH FLORIDA

Major Research Area Paper Presentation

Neuroimaging Based Survival Time Prediction of GBM Patients Using CNNs
from Small Data

by

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For the Ph.D. degree in Computer Science and Engineering

Here we investigate the application of convolutional neural networks (CNNs) to predict the survival time of patients with Glioblastoma Multiforme (GBM) brain tumor. Our dataset consists of T1-weighted high-resolution MRI images of just 68 GBM patients. We compare two analytic methods for predicting survival time. The first consists of training a small convolutional neural network (CNN) and the second uses extracted deep features from a pre-trained CNN. Our method is completely automated, except for tumor region segmentation. In addition, we utilize a snapshot ensemble approach to boost test accuracy when dealing with limited availability of medical images for CNN training purposes. Our approach achieves an accuracy of 72.06% using a trained small network and 66.18% using a pre-trained deep CNN. Our results compare favorably with the accuracy of 54.41% using histogram of oriented gradients (HOG) features and a non-neural network classifier.

Friday, December 6, 2019

11:00 AM

ENB 337

THE PUBLIC IS INVITED

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