Diagnosing brain tumors by segmentation of MRI images

Shirin Sanati[1], Paria Nourbakhsh Sabet[2]

1- Computer Engineering, Ferdowsi University of Mashhad, Mashhad, Iran

2- Computer Engineering, university of Guilan, Guilan, Iran

Abstract

Brain tumor segmentation aims to distinguish between healthy and tumorous tissue. Early and accurate diagnosis of brain tumors increases the chances of people with this complication surviving. Manual tumor segmentation in three-dimensional Magnetic Resonance images (volume MRI) is a time-consuming and tedious task. Its accuracy depends heavily on the operator's experience doing it. The need for an accurate and fully automatic method for segmenting brain tumors and measuring tumor size is strongly felt. Attention to the construction and improvement of CAD systems to diagnose this complication can help experts in this field. In this project, using the ability of deep networks to learn and solve problems, we examined the methods of tumor segmentation in MRI images of the brain. The architecture used in this project is U-Net architecture, which consists of an Encoder and Decoder. An attempt has been made to comprehensively examine how different parameters in education affect the degree of accuracy of Network in two-dimensional version. Six different experiments with different parameters were performed on the Network, and their results were compared.

Keywords: U-Net network, Magnetic Resonance Images, brain tumor, BraTs 2018