

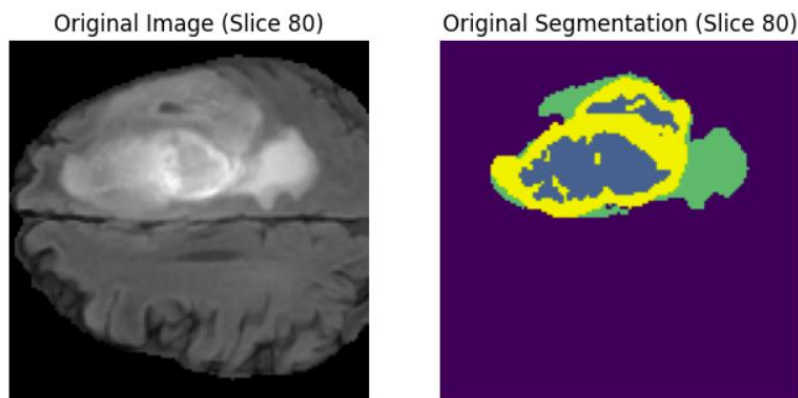
AI for Brain Tumour Segmentation

Background

The purpose of brain tumour segmentation is to identify the tumour regions from 3D MRI scans for diagnosis, treatment and monitoring.

These 3D MRI scans are made up of 100-200 2D images (slices) which make up the 3D image.

Currently, segmentation is performed manually by medical professionals where they must draw out tumour regions across each individual 2D slice, a repetitive process which can take hours per patient.



Example MRI Image Slice and Corresponding Segmentation

Proposed Solution

This proposal aims to automate the brain tumour segmentation process by using a 3D U-Net deep learning model.

Who Would Benefit?

This model could directly benefit medical professionals performing manual segmentations by providing them with an initial prediction to work off, speeding up the current process which can be time consuming.

Further potential also lies in developing a model for other segmentation applications, such as lung tumour or liver tumour segmentation.

Technology

The U-Net model was chosen as it was originally developed for segmentation in biomedical images.

A 3D model was used to be compatible with 3D MRI images.

The 3D U-Net model was trained on a public dataset (BraTS2020) containing 360+ real-world MRI scans of brain tumour patients along with corresponding segmentations performed by medical professionals.