Mémoire de Fin d'étude

Pour l'obtention du diplôme d'**ingénieur d'état**

Filière : **Informatique**

Spécialité : **Ingénierie des Systèmes Informatiques (ISI)**

Thème

Brain Tumor Semantic Segmentation and Classification using Deep Learning techniques

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Soutenu le : **25/06/2023**   Devant le jury composé de :

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Année Universitaire : 2022 / 2023

ACKNOWLEDGMENT

First of all, praise and thanks to Allah Almighty for giving me the patience and motivation that allowed me to accomplish this work. I would like to thank my family especially my sister who assisted me in my research by providing the necessary informations when it came to the medical field. Also thanks to my supervisor Dr Mohammed Yassine KAZI TANI for his guidance and useful critiques of this work. Without forgetting to thank all ESI-SBA school family.

ABSTRACT

Brain cancer, specifically Glioma, is a devastating disease with a very low chance of survival. In fact, only 3.6% of patients diagnosed with high-grade Glioma survive beyond five years. Magnetic resonance imaging (MRI) is commonly used to examine brain tumors in clinical practice. Fortunately, deep learning methods have shown remarkable potential in effectively segmenting brain tumors and have yielded promising results in various biomedical applications.

This project aims to develop and implement a deep learning model capable of performing semantic segmentation of brain tumors. The proposed model leverages advanced deep learning techniques to accurately segment tumor regions from medical imaging data

The project also includes the development of an online platform that provides a user-friendly interface for monitoring and diagnosis of patients with brain tumors.

The online platform will allow users to easily upload their medical images, which will then undergo the segmentation and classification process. The results will be displayed to the users, providing them with valuable insights into the tumor characteristics and aiding in medical decision-making.

Keywords: deep learning, brain tumors, MRI, U-Net, convolutional neural networks

ABBREVIATIONS

MRI Magnetic Resonance Imaging

CT Computed Tomography

HGG High Grade Glioma

LGG Low Grade Glioma

FLAIR Fluid Attenuated Inversion Recovery

ML Machine Learning

AI Artificial Intelligence

DL Deep Learning

CNN Convolutional Neural Networks

MLP Multi Layer Perceptron

GAN Generative Adversarial Network

RNN Recurrent Neural Networks

WT Whole Tumor

TC Tumor Core

ET Enhancing Tumor

SGD Stochastic Gradient Descent

ReLU Rectified Linear Unit