***FIELD BASE PROJECT***

***Batch:32***

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Project name: Brain Tumor Detection and Classification Using artificial intelligence

*Abstract*

Diagnosing a brain tumor takes a long time and relies heavily on the radiologist’s abilities and experience. The amount of data that must be handled has increased dramatically as the number of patients has increased, making old procedures both costly and ineffective. Many researchers investigated a variety of algorithms for detecting and classifying brain tumors that were both accurate and fast. Deep Learning (DL) approaches have recently been popular in developing automated systems capable of accurately diagnosing or segmenting brain tumors in less time. DL enables a pre-trained Convolutional Neural Network (CNN) model for medical images, specifically for classifying brain cancers. The proposed Brain Tumor Classification Model based on CNN (BCM-CNN) is a CNN hyperparameters optimization using an adaptive dynamic sine-cosine fitness grey wolf optimizer (ADSCFGWO) algorithm. There is an optimization of hyperparameters followed by a training model built with Inception-ResnetV2. The model employs commonly used pre-trained models (Inception-ResnetV2) to improve brain tumor diagnosis, and its output is a binary 0 or 1 (0: Normal, 1: Tumor). There are primarily two types of hyperparameters: (i) hyperparameters that determine the underlying network structure; (ii) a hyperparameter that is responsible for training the network. The ADSCFGWO algorithm draws from both the sine cosine and grey wolf algorithms in an adaptable framework that uses both algorithms’ strengths. The experimental results show that the BCM-CNN as a classifier achieved the best results due to the enhancement of the CNN’s performance by the CNN optimization’s hyperparameters. The BCM-CNN has achieved 99.98% accuracy with the BRaTS 2021 Task 1 datase