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AN ENSEMBLE BASED APPROACH FOR OVERALL SURVIVAL PREDICTION OF GLIOMA PATIENTS USING BRAIN MRI IMAGES

KALAICHELVIN¹, KALAISELVI T²

¹Assistant Professor, Department of Information Technology, Fatima College
(Autonomous), Madurai, Tamilnadu, India.

²Assistant Professor, Department of Computer Science and Applications,
The Gandhigram Rural Institute (Deemed to be University), Dindigul, Tamilnadu, India.

ABSTRACT

This paperproposed a machine learning algorithm for classifying the survival rate of brain tumor patients using MRI brain images. In order to enhance the predictions of machine learning models, ensemble techniques are used. This combines more than one predictive model with max voting, average and weighted average techniques. An ensemble model using KNN, decision tree and Navie Bayes classifiers is created in order to predict the overall survival of Glioma patients. The model is evaluated on BraTS2019 training database. This model consolidates the prediction results using max voting technique and reached an accuracy of 55% in predicting short, mid and long survivors of Gliomapatients.

Keywords:AI, Machine Learning, Classification, Regression, Ensemble models, MRI, Survival prediction,accuracy

1. INTRODUCTION

1.1. ARTIFICIALINTELLIGENCE

Training machines to imitate human behavior is artificial intelligence (AI). AI aims to create expert systems with capabilities to acquire knowledge, explore acquired knowledge, suggest its users, making decisions during complex situations based on the training obtained. It includes various computer vision techniques such as Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), Machine vision (MV) and Robotics among which ML and DL plays vital role as shown in Figure 1. Machine learning is based onthe idea of letting machines to learn by themselves from the given data and to predict real time data.

1.2 MACHINELEARNING Based on the type of leaning, ML is sub divided into supervised learning, reinforcement learning and unsupervised learning. Supervised learning allows machine to learn from known dataset so that it finds a pattern between input and output values and builds a model.The model uses this pattern to predict new input data. In reinforcement learning, the machine is trained based on some commands and for every

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