

ABSTRACT

Mushrooms hold great potential as a source of nutrition, but some species contain toxins harmful to the human body. Visual identification of mushrooms is often challenging due to the morphological similarities between edible and poisonous varieties. To address this issue, this research aims to develop a mushroom classification system using a Convolutional Neural Network (CNN) with the EfficientNetV2 architecture. Additionally, this study compares the performance of EfficientNetV2 and EfficientNet architectures to evaluate the effectiveness and efficiency of both models in classification tasks.

The dataset used consists of 6,000 mushroom images, with each class comprising 3,000 images. The dataset underwent pre-processing steps, including resizing, augmentation, and splitting into training and testing data. This study also applied cross-validation techniques to evaluate the model's consistency in predicting data. Experiments involved tuning hyperparameters such as learning rate, batch size, and epoch to optimize model performance.

The results show that EfficientNetV2 achieved the highest accuracy of 95.42% with an optimal parameter combination of a learning rate of 0.0001, a batch size of 32, and 30 epochs. Cross-validation demonstrated consistent model performance with a high average accuracy. Compared to EfficientNet, the EfficientNetV2 architecture exhibited higher efficiency in training time and classification performance.

Index – Terms: *Mushrooms, Mushroom classification, CNN, EfficientNetV2, Cross-Validation.*