

## **Classification of Oral Diseases Using Convolutional Neural Networks**

**Abstract:** This report presents a deep learning-based approach for classifying seven different oral diseases using a Convolutional Neural Network (CNN). The dataset consists of images divided into training, validation, and testing sets. Data augmentation techniques were applied to improve model generalization. The model was trained and evaluated to achieve high accuracy in disease classification.

**Introduction:** Oral diseases are a significant public health concern, and early diagnosis is crucial for effective treatment. This study leverages CNNs to automatically classify seven oral diseases, reducing the need for manual diagnosis.

**Methodology:** The dataset was loaded and preprocessed using the TensorFlow ImageDataGenerator. Data augmentation techniques, including rescaling and zooming, were applied. The CNN architecture consisted of multiple convolutional layers followed by fully connected layers. The model was compiled using categorical cross-entropy loss and optimized with Adam.

**Results and Discussion:** The model was trained on the dataset and achieved a high classification accuracy. Performance metrics such as accuracy and loss curves were analyzed. Data augmentation contributed to improved model performance by enhancing generalization. The results demonstrate the potential of CNNs in medical image classification.

**Conclusion:** This study successfully developed a CNN-based model for oral disease classification. The approach offers a promising solution for automated disease detection, which can assist healthcare professionals in early diagnosis and treatment planning.

**Keywords:** Oral Diseases, Deep Learning, Convolutional Neural Networks, Medical Image Classification