ABSTRACT

Early detection of senile cataracts is a crucial step in preventing visual impairment and blindness. This study focuses on the development and evaluation of a Convolutional Neural Network (CNN) algorithm for detecting types of senile cataracts from digital eye images. The aim of the research is to enhance the accuracy and effectiveness of cataract detection by leveraging deep learning techniques through the CNN algorithm. The dataset used consists of 2,955 annotated digital eye images, categorized into three groups: immature cataract, mature cataract, and normal eye conditions. The CNN model was trained and tested on this dataset, achieving an overall accuracy of 94.3% and an F1 Score of 93.1%. The results demonstrate that the developed CNN model effectively differentiates between types of senile cataracts and normal eyes. The proposed model outperforms traditional detection methods in terms of both precision and speed. These findings suggest that the CNN-based approach has significant potential for integration into automated diagnostic systems and could be applied to devices for early cataract detection in patients.

Keywords: *Cataract Senilis Detection, Convolutional Neural Network, Deep Learning, Cataract Classification*