ABSTRACT

This project aims to develop a deep learning (DL) model for predicting the type of dental disease from dental X-ray images and providing treatment recommendations to patients.

The dataset consists of annotated clinical periapical radiographs depicting various dental conditions such as decay, periapical periodontitis, and periodontitis across different severity levels.

The methodology involves training convolutional neural networks (CNNs) with region proposal techniques to accurately detect and classify these diseases.

Additionally, the model will be equipped with <u>a treatment recommendation system based on established dental treatment protocols and patient-specific factors such as age, medical history, and dental health records.</u>

Evaluation metrics including precision, recall, and F1 score will assess the model's disease classification accuracy, while treatment recommendation effectiveness will be evaluated based on clinical guidelines and expert consensus. The project aims to provide dentists with a tool to streamline diagnosis, enhance treatment planning, and improve patient outcomes.

Limitations such as the need for extensive clinical validation and ethical considerations in AI-driven treatment recommendations will be addressed. Future work includes expanding the dataset, integrating real-time patient data for personalized recommendations, and refining the DL model to incorporate feedback from clinical trials and dental professionals.