INFORMATICS INSTITUTE OF TECHNOLOGY

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Identification And Classification of Dental Malocclusions By Utilizing YOLO Algorithm

Final Project Report by

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Abstract

Dental malocclusions are commonly found in dental issues among the normal population. From modern studies, malocclusions show a 56% prevalence worldwise without difference in gender. Contradicting how common malocclusions are, the awareness of such an issue and the willingness to seek treatment has been low among the public even as the World Health Organization states malocclusions to be one of the most important oral health problems. As feather studies have shown that even though the majority of the population finds their oral hygiene important, 66% claim to only seek oral medical health checkups if necessary. To address the above-mentioned issues, the Simply Say E system was designed to provide potential malocclusion patients to identify their oral occlusive state and provide encouragement if treatment is necessary the system utilizes modern object detection technologies for malocclusion with the use of a simple digital image of the teeth of the user. The system was created using the YOLO algorithm and user a newly created dataset. The system consists of multiple YOLO models, each made to detect a certain aspect of malocclusion and they can be categorized as malocclusion classification detection, malocclusion severity detection, and malocclusion location detection. With the conclusion of the detection, combined with user information such as age, medical history, and habits, the system will generate an informative report. The report may provide the analysis of the user's occlusal state and provide the user with information from dental professionals.

Special precautions were taken to define the value of the systems as much effort was put into evaluation and testing. The proposed system showed a satisfiable accuracy rate of up to 75% with positive feedback from domain experts and well as technical experts.

Subject Descriptors:

- **Computer vision**
- **Image processing**
- **Dental healthcare**

Keywords:

YOLO algorithm, Object detection, Malocclusions

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