



Cairo University

AUTOMATIC CONSTRUCTION OF CAM BRACES GUIDE FOR ORTHODONTIC TREATMENT PLAN

By

Lamia Nabil Mahdy Abdalrahman

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the Requirements for the Degree of
DOCTOR OF PHILOSOPHY
In
Biomedical Engineering and Systems

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Title of Thesis:

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Key Words:

(Surgical guide- Orthodontic – Bracket placement-Teeth segmentation-Teeth
visualization)

Summary:

Accurate placement of orthodontic brackets is an important issue for orthodontists as it is the first step in the treatment plan. Experience of orthodontist, molds, dental casts and wax-up have been applied in orthodontics for a long time. Traditionally, the clinicians obtain the dental cast and analyze it manually to position the brackets on each tooth. Manual estimation of the bracket position consumes time but is important to achieve good treatment results. Accurate determination of bracket placement on each tooth is needed to achieve the optimal result.

In this work, computer aided design/computer aided manufacture (CAD/ CAM) are used to build a module for computing the position of the brackets while allowing the orthodontist to adjust bracket position as desired. Benefits for using this CAD/ CAM module for building brackets guide in the phase of treatment planning increase the accuracy of teeth brackets placement which directly improves the final outcome, it reduces brackets repositioning, steps of treatment planning, used instrumentation, time spent on the chair side, stresses applied on each tooth and less pain.

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DEDICATION

Thanking to Allah for all the blessings that are given to me in life

I would like to thank my parents for their efforts, love and care for me since my childhood until now.

I like to thank them for helping me to achieve my dreams and wishes.

.

I would like to thank my Brothers, Who helped me a lot in facing many obstacles. I wish to them happiness and success.

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