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

FACULTY OF ENGINEERING, CAIRO UNIVERSITY

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Under the Supervision of

Prof. Dr. Ahmed M. El-Bialy
……
Professor
Biomedical Engineering And Systems
Department, Faculty of Engineering,
Cairo University, Egypt.

Dr. Ahmed H. Kandil

Associate Professor
Biomedical Engineering And Systems
Department, Faculty of Engineering,
Cairo University, Egypt

Dr. Sahar Ali Fawzy

Associate Professor
Biomedical Engineering And Systems
Department, Faculty of Engineering,
Cairo University, Egypt

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Approved by the
Examining Committee

Prof. Ahmed M. El-Bialy, Main Thesis Advisor
_____
Associate Prof. Ahmed H. Kandil, Advisor
_____
Prof. Yahia Ahmed Mostafa, Member
Professor, Orthodontics Department- Faculty of Dentistry - Cairo University
_____
Prof. Mohamed Tarek El-Wakad, Member
Professor, Biomedical Engineering Department- Faculty of Engineering- Helwan University
_____

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT

2015

Engineer's Name: Lamia Nabil Mahdy Abdalrahman
Date of Birth: 1/5/1982
Nationality: Egyptian
Registration Date: 1/10/2009
Awarding Date: / / 2015
E-mail: Englamia_82@yahoo.com
Phone: 01002028806
Address: 1 Almadina Almonawara -Alnozha Algdeda- Cairo- Egypt
Department: Biomedical Engineering and Systems
Degree: DOCTOR OF PHILOSOPHY

Supervisors:

Prof. Ahmed M. El-Bialy
Associate Prof. Ahmed H. Kandil
Associate Prof. Sahar A. Fawzy

Examiners:

Prof. Ahmed M. El-Bialy
Associate Prof. Ahmed H. Kandil
Prof. Yahia Ahmed Mostafa
Professor, Department of orthodontics
Faculty of Dentistry - Cairo University
Prof. Mohamed Tarek El-Wakad
Professor, Biomedical Engineering
Department Faculty of Engineering, Helwan University

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.

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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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