# Table of Contents

Foreword ............................................................................................................................................. xvi

Preface .............................................................................................................................................. xviii

Acknowledgment .......................................................................................................................... xxi

## Section I
**Software Support in Clinical Dentistry**

### Chapter I
Software Support for Advanced Cephalometric Analysis in Orthodontics .............................................. 1  
*Demetrios J. Halazonetis, National and Kapodistrian University of Athens, Greece*

### Chapter II
A New Software Environment for 3D-Time Series Analysis ........................................................................ 28  
*Jörg Hendricks, University of Leipzig, Germany*
*Gert Wollny, Universidad Politécnica de Madrid, Spain*
*Alexander Hemprich, University of Leipzig, Germany*
*Thomas Hierl, University of Leipzig, Germany*

### Chapter III
Relationship Between Shrinkage and Stress .......................................................................................... 45  
*Antheunis Versluis, University of Minnesota, USA*
*Daraneet Tantbirojn, University of Minnesota, USA*

### Chapter IV
An Objective Registration Method for Mandible Alignment ....................................................................... 65  
*Andreas Vogel, Institut für Medizin- und Dentaltechnologie GmbH, Germany*
Section II
Software Support in Oral Surgery

Chapter V
Requirements for a Universal Image Analysis Tool in Dentistry and Oral and Maxillofacial Surgery

Thomas Hierl, University of Leipzig, Germany
Heike Hümpfner-Hierl, University of Leipzig, Germany
Daniel Kruber, University of Leipzig, Germany
Thomas Gäbler, University of Leipzig, Germany
Alexander Hemprich, University of Leipzig, Germany
Gert Wollny, Universidad Politécnica de Madrid, Spain

Chapter VI
Denoising and Contrast Enhancement in Dental Radiography

N. A. Borghese, University of Milano, Italy
I. Frosio, University of Milano, Italy

Chapter VII
3D Reconstructions from Few Projections in Oral Radiology

Ralf K.W. Schulze, Klinikum der Johannes Gutenberg-Universität, Mainz, Germany

Section III
Software Support in Tissue Regeneration Procedures in Dentistry

Chapter VIII
Advances and Trends in Tissue Engineering of Teeth

Shital Patel, Swinburne University of Technology, Australia
Yos Morsi, Swinburne University of Technology, Australia

Chapter IX
Automated Bacterial Colony Counting for Clonogenic Assay

Wei-Bang Chen, University of Alabama at Birmingham (UAB), USA
Chengcui Zhang, University of Alabama at Birmingham (UAB), USA
Section IV
Software Support in Dental Implantology

Chapter X
A New System in Guided Surgery: The Flatguide™ System
Michele Jacotti, Private Practice, Italy
Domenico Ciambrone, NRGSYS ltd, Italy

Chapter XI
Visualization and Modelling in Dental Implantology
Ferenc Pongracz, Albadent, Inc, Hungary

Chapter XII
Finite Element Analysis and its Application in Dental Implant Research
Antonios Zampelis, School of Applied Mathematics and Physical Sciences, Greece
George Tsamasphyros, School of Applied Mathematics and Physical Sciences, Greece

Section V
Software Support in Clinical Dental Management and Education

Chapter XIII
Electronic Oral Health Records in Practice and Research
Amit Chattopadhyay, University of Kentucky, USA
Tiago Coelho de Souza, University of Kentucky, USA
Oscar Arevalo, University of Kentucky, USA

Chapter XIV
Haptic-Based Virtual Reality Dental Simulator as an Educational Tool
Maxim Kolesnikov, University of Illinois at Chicago, USA
Arnold D. Steinberg, University of Illinois at Chicago, USA
Miloš Žefran, University of Illinois at Chicago, USA

Chapter XV
Digital Library for Dental Biomaterials
Anka Letic-Gavrilovic, International Clinic for Neo-Organs – ICNO, Italy

Chapter XVI
Rapid Prototyping and Dental Applications
Petros Koidis, Aristotle University of Thessaloniki, Greece
Marianthi Manda, Aristotle University of Thessaloniki, Greece
Chapter XVII
Unicode Characters for Human Dentition: New Foundation for Standardized Data Exchange and Notation in Countries Employing Double-Byte Character Sets

Hiroo Tamagawa, The Japan Association for Medical Informatics, Japan
Hideaki Amano, The Japan Association for Medical Informatics, Japan
Naoji Hayashi, The Japan Association for Medical Informatics, Japan
Yasuyuki Hirose, The Japan Association for Medical Informatics, Japan
Masatoshi Hitaka, The Japan Association for Medical Informatics, Japan
Noriaki Morimoto, The Japan Association for Medical Informatics, Japan
Hideaki Narusawa, The Japan Association for Medical Informatics, Japan
Ichiro Suzuki, The Japan Association for Medical Informatics, Japan

Chapter XVIII
Virtual Dental Patient: A 3D Oral Cavity Model and its Use in Haptics-Based Virtual Reality Cavity Preparation in Endodontics

Nikos Nikolaidis, Aristotle University of Thessaloniki, Greece
Ioannis Marras, Aristotle University of Thessaloniki, Greece
Georgios Mikrogeorgis, Aristotle University of Thessaloniki, Greece
Kleoniki Lyroudia, Aristotle University of Thessaloniki, Greece
Ioannis Pitas, Aristotle University of Thessaloniki, Greece

Compilation of References

About the Contributors

Index