

Article

A Comparative Analysis of Artificial Intelligence and Manual Methods for Three-Dimensional Anatomical Landmark Identification in Dentofacial Treatment Planning

Hee-Ju Ahn ^{1,2,3,4,5,*} , Soo-Hwan Byun ^{1,2,3,4,5,*} , Sae-Hoon Baek ^{1,2,3,4}, Sang-Yoon Park ^{1,2,3,4} , Sang-Min Yi ^{1,2,3,4}, In-Young Park ^{2,3,4,5}, Sung-Woon On ^{2,3,4} , Jong-Cheol Kim ^{1,7} and Byoung-Eun Yang ^{1,2,3,4,*} 

- ¹ Department of Oral and Maxillofacial Surgery, Hallym University Sacred Heart Hospital, Anyang 14068, Republic of Korea; mathjunior@naver.com (H.-J.A.); pueit08@daum.net (S.-H.B.); intse@naver.com (S.-H.B.); psygyjy01128@naver.com (S.-Y.P.); queen2108@hallym.or.kr (S.-M.Y.); ddskgo@hanmail.net (J.-C.K.)
- ² Department of Artificial Intelligence and Robotics in Dentistry, Graduate School of Clinical Dentistry, Hallym University, Chuncheon 24252, Republic of Korea; denti28750@hallym.or.kr (I.-Y.P.); drummer09080@hanmail.net (S.-W.O.)
- ³ Institute of Clinical Dentistry, Hallym University, Chuncheon 24252, Republic of Korea
- ⁴ Dental Artificial Intelligence and Robotics R&D Center, Hallym University Sacred Heart Hospital, Anyang 14068, Republic of Korea
- ⁵ Department of Orthodontics, Hallym University Sacred Heart Hospital, Anyang 14068, Republic of Korea
- ⁶ Division of Oral and Maxillofacial Surgery, Department of Dentistry, Hallym University Dongtan Sacred Heart Hospital, Hwaseong 18450, Republic of Korea
- ⁷ Mir Dental Hospital, Daejeon 41940, Republic of Korea
- * Correspondence: face@hallym.ac.kr; Tel.: +82-31-380-3870
- * These authors contributed equally to this work.



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Abstract: With the growing demand for orthognathic surgery and other facial treatments, the accurate identification of anatomical landmarks has become crucial. Recent advancements have shifted towards using three-dimensional radiologic analysis instead of traditional two-dimensional methods, as it allows for more precise treatment planning, primarily relying on direct identification by clinicians. However, manual tracing can be time-consuming, mainly when dealing with a large number of patients. This study compared the accuracy and reliability of identifying anatomical landmarks using artificial intelligence (AI) and manual identification. Thirty patients over 19 years old who underwent pre-orthodontic and orthognathic surgery treatment and had pre-orthodontic three-dimensional radiologic scans were selected. Thirteen anatomical indicators were identified using both AI and manual methods. The landmarks were identified by AI and four experienced clinicians, and multiple ANOVA was performed to analyze the results. The study results revealed minimal significant differences between AI and manual tracing, with a maximum deviation of less than 2.83 mm. This indicates that utilizing AI to identify anatomical landmarks can be a reliable method in planning orthognathic surgery. Our findings suggest that using AI for anatomical landmark identification can enhance treatment accuracy and reliability, ultimately benefiting clinicians and patients.

Keywords: dentofacial deformity; anatomical landmarks; artificial intelligence; three-dimensional radiologic analysis; accuracy; reliability

1. Introduction

Since its introduction by Broadbent in 1931, cephalograms have become a standard method for analyzing the skull and facial bones, measuring the dimensions and contours of craniomaxillofacial structures, and assessing their growth and maturation [1]. Among these, lateral cephalogram is considered the most reliable tool for evaluating craniofacial development, diagnosing orthodontic problems, planning treatments, assessing treatment outcomes, and predicting further growth of the craniomaxillofacial region. Cephalograms

Manual Methods For Microorganism Identification

Sebastian Brünink



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The Top Books of the Year Manual Methods For Microorganism Identification The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous compelling novels captivating the hearts of readers worldwide. Let's delve into the realm of bestselling books, exploring the captivating narratives that have enthralled audiences this year.

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These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered.

The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts.

The Secret History is a masterful and suspenseful novel that will keep you wondering until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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