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Original Article

Automated Cephalometry: System Performance Reliability Using Landmark-Dependent Criteria

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Abstract

Objective: The purpose of the present study was to evaluate reliability of a system that performs automatic recognition of anatomic landmarks and adjacent structures on lateral cephalograms using landmark-dependent criteria unique to each landmark.

Materials and Methods: To evaluate the reliability of the system, the system was used to examine 65 lateral cephalograms. The area of each system-identified anatomic structure surrounding the landmark and the position of each system-identified landmark were compared with norms using confidence ellipses with $\alpha = .01$, which were derived from the scattergrams of 100 estimates obtained according to the method reported by Baumrind and Frantz. When the system-identified area overlapped with the norm area, anatomic structure recognition was considered successful. In addition, when the system-identified point was located within the norm area, landmark identification was considered successful. Based on these judgment criteria, success rates were calculated for all landmarks.

Results: The system successfully identified all specified anatomic structures in all the images and determined the positions of the landmarks with a mean success rate of 88% (range, 77%– 100%).

Conclusion: With the incorporation of the rational assessment criteria provided by confidence ellipses, the proposed system was confirmed to be reliable.

Keywords: [Cephalograms](#), [Automatic recognition](#), [Landmarks](#)

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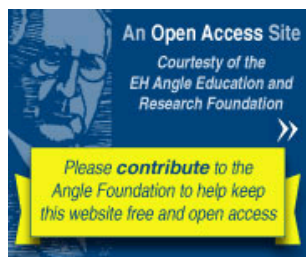
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