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A new method for craniofacial approximation based on EDMA

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Abstract

The facial appearance of a person is determined by the structure of the skull. The measurement of the soft tissue thickness was considered the best method for finding the relationship between the skull and face in facial reconstruction. However, the measured thickness of soft tissue was the normal distance between the landmarks on the face and the skull, and in fact angles may exist between the corresponding landmarks on the face and the skull, so that accuracy of facial reconstruction could be defected. In this study, the database of craniofacial MRI of 300 Cinese volunteers with equal numbers of male and female, aged 20 to 60 years old, will be divided into 8 age groups (every 5-years in between), 40 skull landmarks and 35 facial landmarks will be chosen, and the system will be set according to the Frankfurt horizontal plane, the three-dimensional coordinates will be obtained using ETDIPS software and be used to replace the spatial position of the anatomical landmarks on the face and skull, and thus expand the measurement of soft tissue thickness from two-dimensions to three-dimensions; By using Euclidean Distance Matrix Analysis (EDMA) and adopting the form matrix (FM) for the soft tissue thickness to represent the relationship between the skull and facial structures, together with the practice of the Glmnet program and the identification of the relationship between the FM for skull and raniofacial structure, the anatomical relationship in vivo between the skull and facial can be accurately reconstructed.

Biography

Ren Fu has completed his Ph.D. at the age of 35 years from China Medical University, postdoctoral studies from Shenyang Pharmaceutical University, and as a visiting scholar in University of Toronto. He is the director of Institute of Biological Anthropology of Liaoning Medical University. He interested in the field of personal identification by bone, especially in forensic facial comparison and craniofacial visualization modeling, including the cranial photography superimposing and facial reconstruction from skull.