



Physical Anthropology Section – 2009

H60 The Role of Adult Age-Related Craniofacial Changes and the MORPH Database in Computer Automated Face Recognition Research and Development

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The goal of this presentation is to present how osteological and anatomical knowledge, in terms of adult age-related craniofacial morphologic changes, are used in computer science research for forensic purposes.

This presentation will impact the forensic community by explaining the key ways in which craniofacial morphologic changes occur across the adult age span and will provide information of the relevance of this information to computer automated face recognition technology through a discussion of how these data are currently being used.

First, attendees will gain an understanding of the key ways in which craniofacial morphologic changes occur across the adult age span, in terms of the general sequence and pattern of change due to normal aging effects. Secondly, attendees will be informed of the relevance of the above information to computer automated face recognition technology through a communication of how these data are currently being used, namely through research conducted using the MORPH database.

Further, attendees will be updated on the status of the dynamic MORPH database, founded in 2003, and currently expanding. Recently, the MORPH database has had a significant impact internationally as well as domestically, mainly within the computer science arena, but its existence still remains largely unknown to many practitioners and researchers within the forensic anthropology community, and the forensic science community at large. This presentation will help disseminate features of this ongoing work.

An awareness and understanding of the application of knowledge stemming from studies related to craniofacial age changes, bone remodeling of the skull, and so forth, has been raised within the computer science community. In turn, an awareness of the ways in which the computer science community is using osteological and anatomical information of this nature is critical for those forensic anthropologists who might presently, or in the future, desire to conduct individual or collaborative research involving adult age-related craniofacial remodeling and or forensic face recognition/facial reconstruction methods and technologies.

For example, within the security and law enforcement venues, face recognition research typically involves testing the efficacy of computer algorithms to match later-obtained digitized images of individuals' faces (usually perpetrators of crime, terrorists, missing persons, or fugitives) with existing or earlier-obtained images of the same individuals (digitized mug shots, photographs, and the like). A further step in research of this nature has been to explore the capabilities of computer algorithms to match faces after a significant period of time has passed between facial images, or rather, after a number of years have passed, after the individual in question has aged, five, ten, twenty, or more years. This is where understanding the sequence, pattern, and variation of age-related craniofacial morphologic changes comes into play.

A synopsis of the ways in which the computer science community is using information and about how the craniofacial complex remodels during the adult decades of life will be presented, followed by an overview of the current status of the MORPH database. The MORPH database comprises thousands of images of thousands of individuals and has played a vital role in our understanding of face recognition and how faces age from late adolescence through senescence, given that large sample sizes of known faces aged across the adult lifespan have now become available for study.

Age-Related Craniofacial Remodeling, Computer Automated Face Recognition, MORPH Database