D74 3D Facial Approximation: Lingering Problems and Improving Outcomes

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The goal of this presentation is to demonstrate the roles of both traditional and digital facial approximation (reconstruction) and to suggest appropriate applications for traditional, digital, and hybridized approaches to improve outcomes.

This presentation will impact the forensic science community by providing an evaluation of the current challenges inherent in facial approximation and pathways to overcome them. Organizations in need of this service should be able to discern which form of facial reconstruction is most useful to their efforts. While some agencies are better served by a completely digital or hybridized approximation, others might prefer a traditional approximation for display or educational purposes. Likewise, practitioners must examine and understand the rich complexity of skills necessary to perform facial approximations in both media in order to assess their strengths and weaknesses in the field.

The procedure as it currently exists suffers from several deficiencies. This is a field that requires an unusual blend of abilities: advanced sculpture; osteology; physical and forensic anthropology; and extraordinary observation skills in addition to knowledge of law enforcement procedures. Most people cannot perform well in all of these areas. Second, there are gaps in the science supporting the process of facial approximation. Tissue depth data is generally insufficient and whole racial or ethnic groups are under-represented. Further complicating matters, obesity and the growing number of individuals with multiracial ancestries is becoming more common, with limited tissue data existing for these societal trends. Lastly, the reliability of certain elements of the procedure can vary, with these differences often treated as equally important by practitioners. What are the most and least scientifically reliable elements to the reconstruction process? Can the least reliable elements be improved to make the results more predictable? These questions are addressed in the presentation.

Initially, learning the process of facial approximation in the traditional medium of clay is a valuable way to begin for several reasons: the highly specific challenges become immediately apparent; keying landmarks and interpreting the skull surface with precision are better done in real space; and a developed tactile sense markedly improves digital sculpting. After training in traditional media, practitioners are more equipped to recognize and compensate for the deficiencies of digital approximation. Because traditional media is rarely used in law enforcement today, it becomes a challenge to maintain the strengths of traditional practice while integrating new media.

Although the advantages of digital media are obvious, it is just as clear that none of those advantages will overcome poor observational skills or a weak understanding of human osteology, deep, superficial, and surface structures, or the aging process. Design and rendering software builds on traditional fine arts skills and cannot mask their absence.

Unreliable results, high cost, and few practitioners are the reasons agencies do not use this technique more often. The expertise of artists is vital to the process, but not yet represented throughout the discipline. Interdisciplinary communication and cooperation would create more standardization and reliable results.

A key recommendation of this presentation is to seek improved communication and integration of the disciplines most directly linked to facial approximations, including law enforcement agencies, digital technicians, and traditionally trained artists. Many other disciplines may be consulted as determined by each case. Over-reliance on the technical side of digital approximations has led to mannequin-like reconstructions that look generic, thereby hindering the usefulness of the endeavor.

Conclusions on unreliable aspects of the process as well as best practices for the creation and the dissemination to the public will be detailed in the presentation. Additional recommendations regarding technical, scientific, communication, and dissemination concerns will be offered.

Facial Approximation, Facial Reconstruction, Forensic Art

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