

BOOK REVIEW

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Review of: *Computer-Graphic Facial Reconstruction*

REFERENCE: Clement JG, Marks MK, editors. *Computer-graphic facial reconstruction*. Burlington, MA, USA: Elsevier Academic Press, 2005, 390 pp+xviii, \$99.95.

Putting a face on a skull has historically been an enterprise combining anatomy and art.

The remarkable progress in computer imaging over the past decade or so has inevitably led to attempts to automate this process. This volume clearly demonstrates the almost frenetic level of activity directed toward that goal and related goals. It brings together papers originally presented at the International Association for Craniofacial Identification held in Washington, D.C., in 2000.

The volume contains 19 chapters by 38 authors. The chapters are divided into four parts: Part I: History and Background; Part II: Concepts and Creation of Facial Reconstruction Models; Part III: Perception, Recognition, and Identity; and Part IV: Applications of Computer Graphic Facial Reconstruction. Potential purchasers of this volume should be aware that it actually deals with a broader range of topics than the title implies. Topics include such things as computerized reconstruction of fragmentary skulls, facial recognition, identification using superimposition, and dental identification. The volume would actually be better described as computerized craniofacial identification, the theme of the conference that gave rise to it.

Part I, History and Background contains five chapters, including an introduction by the editors. This introduction provides a hint of the preliminary nature of computerized facial reconstructions with the frank admission that they have yet to improve on traditional clay reconstructions. The core of the volume is Part II, containing five chapters. These five chapters summarize the approach and status of various groups working on facial reconstruction. For the most part, they are progress reports indicating where their work is headed. Few papers include actual results or data.

Parts III and IV deal mostly with topics only indirectly related to facial reproduction. Critical to facial reproduction of any kind is the ability of others to recognize the reconstruction as the target individual. Explicit tests of recognition ability based on face shape (Chapter 11) give little cause for optimism. The manner in which the brain processes images and retains them is critical in facial reconstructing faces from previously seen faces (Chapter 14).

One cannot help but be impressed by the technological and software capabilities that have been brought to bear on this topic. It is also clear that progress is constrained as much by biology as technology. Tissue thickness criteria and the relationship between soft tissue and bony landmarks are still averages or approximations and it may never be possible to make good estimates of the specific individual under consideration. To make matters worse, tissue thicknesses must be changing with the increasing obesity of populations in the developed world. Issues of race and ethnicity are also obviously critical in accurate reconstruction and require extensive data not generally available now.

This volume does illustrate the degree of collaboration required of those in different disciplines in order to see progress. Contributors are biomedical engineers, anthropologists, orthodontists, clinicians, forensic scientists, and psychologists. It also illustrates the international nature of the effort. Contributions come from at least 10 countries, led by the United States, Australia, and the United Kingdom.

As one normally expects from conference proceedings, the volume is not well integrated. It does provide the reader with a good sense of where this field is and where it is going. At \$99.95, it may not be top priority for graduate students or many professionals, particularly as it will go out of date fairly soon in this fast-moving field.

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