H103 Computer Assisted Facial Reconstruction Technique

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The objective of this paper is to present the methodology of twodimensional (2D) facial reconstruction used at the Forensic Sciences Laboratory of the French Gendarmerie and the subsequent results. Secondly, a research project examining computerized three-dimensional (3D) reconstruction will be shown.

Identifying skeletal remains can be difficult. Facial reconstruction techniques may be required to provide information regarding the facial characteristics of the unknown remains. The process of computerized 3D reconstruction can offer additional information about the real face of the victim and can assist in the identification process.

Among the activities of the Forensic Medicine Department of the Institut de Recherche Criminelle de la Gendarmerie Nationale, facial reconstruction often represents the ultimate solution for the identification process of a body. This method is employed only when more traditional methods of identification do not allow for a positive identification.

The basic approach of the method is based on the principle of the facial sketch, which traditional was applied to cases where a crime victim would describe the facial features of a perpetrator. In the case of skeletal remains, it is the skull that describes the facial features of person and helps ascertain its shape and proportions. The technique used in the Laboratory is relies on the method of 2D image warping. Since 1996, it has aided in the identification of victims who would otherwise remain unknown. At the request of paleoanthropologists, this method has also been applied to reconstruct facial features of crania from historic and prehistoric sites.

At the present time, the Laboratory is involved with a research project along with a local computer sciences university. This project will further our goals of developing an application software for 3D reconstruction. Using tridimensional anatomical data, this new approach will restore the relief of a face according to the underlying anatomy with a numerical data bank of muscles and soft tissue thicknesses of the face. As a result, the face can be presented in front, profile, three-quarter view. This anatomical and tridimensional approach of facial reconstruction is interdisciplinary and involves the specialties of anatomy, anthropology, plastic surgery, computer science, forensic pathology, and radiology. The results of this project have the potential to draw in other disciplines, such as aesthetic and reconstructive plastic surgery and facial and maxillary surgery.

Facial Reconstruction, Computer, Identification