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## D61 Image Processing Application to Anthropological Automatic Characterization in Forensics

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The goal of this presentation is to propose an automatic method of anthropometric data collection in forensics, making the process as automated as possible.

This presentation will impact the forensic science community by explaining the proposed procedure which was applied to anthropometric examinations performed on subjects whose photos were taken by security cameras in public places.

The goal of this work is the implementation of a software application that provides an automatic method of anthropometric data collection of an individual. In particular, it has created a tool that could detect human physiognomy information starting from a still image, taken from a movie by a security camera, using clear reliefs of sample objects taken at the scene of the crime.

The photo shows the objects on a flat surface and the illusion of depth is given solely from the perspective and chiaroscuro. It is therefore not immediately possible to detect the actual size of an object represented in a still image. The only method of obtaining this information is through direct confrontation with another item in the same creative whose size is known. Based on this principle, the proposed software application was produced. For this study, video recordings at the crime scene were viewed to capture an image that reflected the subject at full length, then a number of steps were performed, including the following: (1) identifying an item in the recording whose measurement is known or readily available, that can be used as a reference object; (2) carrying out a survey in order to detect the object reference measurements and any other useful elements for the same purpose; (3) highlighting inside the image points, which identifies the reference sample and the element to gain size perspective; and, (4) carrying out appropriate scaling operations, dictated by the rules of perspective, between actual measurements and those selected in the image. Based on the results, an anthropomorphic profile of the individual can be obtained.

Previously, it was already possible to perform all the above operations using manual methods to calculate all anthropometric data, minus a margin of error due to the tools and methods used for the measurement.

The proposed procedure was initially applied to an anthropometric examination performed on an armed subject, taken by security cameras in a public place. These pictures were used to finally conduct a functional testing of the software produced. The application that is described here will make the process the most automated possible, in such a way as to minimize measurement errors of an accidental and instrumental type.

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### Image Processing, Automatic Characterization, Software Implementation