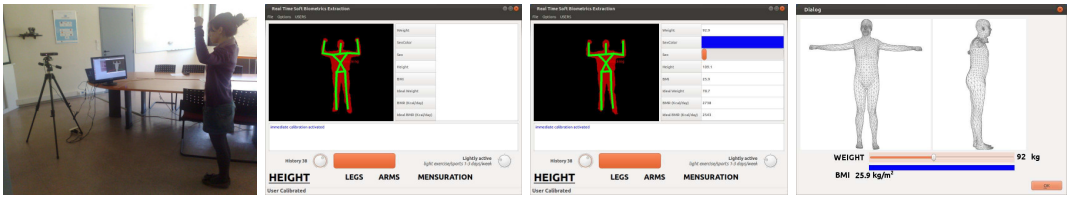
Real Time Extraction of Body Soft Biometric for Telemedicine

Carmelo Velardo and Jean-Luc Dugelay
Multimedia Department, EURECOM
2229 Route des Crêtes, 06560 Valbonne, France
velardo@eurecom.fr, dugelay@eurecom.fr



(a) (b) (c) (d)

Figure 1: (a) The setup of our demo. A person is standing in front of the sensor triggering the estimation phase by assuming the calibration pose. (b) User's skeleton is tracked. (c) Measures are extracted and weight, gender, BMI, Ideal weight are computed. (d) The final representation of the user body is modeled thanks to Bmivisualizer [3]

This technical demonstration shows an application of our research on body soft biometrics [1]. Using a 3D video sensor (Kinect) we are able to extract semantic information that describes subjects standing in front of the camera. Body part tracking is performed and a series of anthropometric traits are measured. Thanks to those measures, subjects' weight, and gender information are estimated. The information is exploited to provide hints about someone's health status with respect to his/her position in a scale of healthiness. Our algorithm allows the estimation of all these parameters in real time without requiring the computational complexity of a 3D model fitting approach.

In our demonstration the Microsoft Kinect sensor, originally developed for gaming and natural user interaction, is exploited to fill the gap between biometric theory and practice. Using off the shelves components and this new cheap sensor, we are able to extract semantic information from one or more users standing in front of the camera (see fig. 1). In our case we are able to extract the height, weight, and gender information of the user thanks to the application of our theoretical study based on anthropometric measures [1, 2].

Moreover, by exploiting several medical studies [1] we connect this information into a soft biometric signature that profiles the user and that helps to understand his/her body health conditions providing weight, gender, BMI, ideal weight, and the optimal calories' intake computed thanks to formulas extrapolated by medical studies. The data are further used as input to the graphical tool provided by [3]. We convey the output of their system so as to automatize the process of data input.

The result for the user is an immersive telemedicine experience that helps the perception of his/her own body. In figure 1 the components of our interface are shown. The precision that the system is able to reach in case of constrained scenario is references in [4].

References

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