Detection and Recognition of Hand Gesture for Wearable Applications in IoMT

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Abstract—To support an efficient media consumption in wearable and IoT (Internet of Things) environments, the standardization of IoMT (Internet of Media-Things) is in the progress in MPEG (Moving Picture Experts Group). In this paper, we present a method to detect and to recognize hand gestures for generating hand gesture-based commands to control the media consumption in smart glasses. First, we present a detection method that utilizes depth image obtained by incoming stereo image sequences and skin color information in a combined way. Secondly, we are going to present the representation of detected hand contours based on Bézier curve as metadata to provide an interoperable interface between a detection module and a recognition module in an IoMT framework. In addition, the comparison with existing standard tools that can be used for hand gesture representation is given. In the recognition module, the detected hand contour is reconstructed by parsing delivered metadata. A set of hand gestures featured with diverse combination of open fingers and rotational angles is used for the hand gesture recognition in the proposed recognition method. Finally, the recognized hand gesture is mapped into one of the pre-defined set of gesture commands. Experiment results show that the proposed method gives quite stable performance of detection and recognition of hand gesture along with interoperable interface between both processing modules.

Keyword—MPEG Internet of Media-Things (IoMT), Smart Glasses, Hand Gesture Recognition, Hand Gesture Detection, Bézier curve

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