FiMAN: A COMPUTER SYSTEM FOR FINGER MOTION ANALYSIS

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ABSTRACT

The introduction in the market of new devices and sensors with infrared technology has opened new opportunities for the development of specialized software for body motion analysis, in areas such as health, virtual and augmented reality, robot control and entertainment. In this article we present FiMAN, a computer system that allows capturing and visualizing detailed finger and hand motion in 3D and real time, using a Leap Motion sensor. FiMAN allows to record, store and replay finger motion for post-mortem analysis. We developed a modular system using components for visual, structural, analysis, statistical and sound management, which include also data capture a manipulation. Thanks to its modular design, FiMAN is a generic framework for the development of specialized motion analysis applications. As a Case Study, we extended FiMAN as a tool for musical education, namely to support teaching of piano techniques, through a virtual piano keyboard with a sound module. The real life usage of FiMAN, demonstrated its modularity and extensibility for its applicability in different areas related to motion analysis.

Keywords: Finger Motion Analysis, Sensor, Leap Motion, Virtual Keyboard.