Remotely Monitoring Activities of the Elders Using Smart Watches

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Smart watches are first produced as an extension to smart phones. At the first examples, they are used to show notification pushed by the mobile applications running at smart phones. The connection between smart watches and the smart phones is initially established via Bluetooth technology. Upon receiving popular demand from the customers, the smart watch producers began to add new capabilities and expand the existing ones. Nowadays, smart watches have different sensors such as accelerometer, gyroscope, magnetometer, etc. They are furnished with WiFi, GSM, and Bluetooth network cards. Their battery life, computation power, and quality of screen resolution are developing fast. In addition to all these capabilities, the price is dropping with the increasing competition.

In this paper, we propose and develop a model for using smart watches as Internet of Things (IoT). IoT can be defined as a network of physical devices, vehicles, buildings and other items which have electronics, software, sensors, and network connectivity so that these “things” can collect and exchange data. In the proposed model, sensors embedded in the smart watches collect sensory data about the user and transfer it to a central via a wireless connection. At the central, the adapted artificial intelligence method is applied to the sensory data to extract some information about the user. According to the extracted information, central can communicate with either the user via smart watch or some predetermined responsible entity via a text message or mail.

We apply this model to monitor and predict the health condition and daily activities of elderly people. In the proposed system, we aim to identify daily activities such as walking, sitting, falling, etc., by using the data acquired from the sensors of the smart watches. Upon detecting falling, the central communicates with the user to check if he or she is safe. Those fallings may cause dangerous injuries as well as death of the elderly people if necessary actions are not taken on time. If the user cannot reply to the central’s query within a specific duration, the proposed system generates an alarm message which is sent to the family members or healthcare workers to inform the situation.

The proposed system is implemented and first experiments are promising. As smart watches have the necessary hardware and sensors, the implementation such an IoT would not cost much. Besides it will be a user friendly system that will not make the elderly uncomfortable. As being a watch, this device can be always on the user.