

Ubiquitous and real time heart rate monitoring and alerting system on Android

Abstract

Premature Atrial Contractions (PACs) can trigger more serious arrhythmia, such as atrial fibrillation (AF), which can cause heart failure. It particularly occurs when the heart rhythm is very rapid. A recent study shows that 17.3 million people die because of the cardiovascular disease. In fact, if PACs can be detected earlier, the worst condition can be prevented for saving many lives. Many works for detecting PACs have been proposed; however, the results are inaccurate. In addition, most of these works cannot give an early warning when PACs is onset. As such, analysis of PACs still relies on cardiologists where their numbers are very limited and usually live in large cities. To solve the problems, this research develops a PACs detector with early warning system. Besides being able to provide an early warning on the detected PACs, the proposed system also have a capability to monitor the heart beat continuously anywhere and anytime. It uses Pan-Tompkins algorithm for detecting QRS complex and utilize RR interval to detect the premature contractions. The algorithm is installed in a server, which receives the heartbeats data from client. Meanwhile, the communication between the client and server will consider MQTT protocol and will be built on top of Open MTC of Telkom University. Agile software development method will be used in developing the proposed system. Hopefully, the proposed system can accurately detect PACs and able to provide early warning correctly. Surprisingly, the system will also be designed to ubiquitously monitor the heart beat in real-time.

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