

Patient Health Monitoring with a Wellness Score Using Body Area Networks

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In this dissertation project, an entirely wireless and electronic patient health monitoring system is proposed. The project is further motivated as a way to inform medical professionals contextualised sensor data from patients as close to real time as possible and improve patient outcome quality.

The patient health monitoring system proposed in this dissertation takes advantage of the state of art wireless sensing and wireless communication technologies. The system adds a supplementary tier to the typical architecture of a wearable wireless health monitoring system by incorporating a device fixed onto the end-user for the relay of information to a medical professional. In the prototype, four on-body sensors, measuring blood pressure, blood oxygenation, heart rate and movement, form a body area network and communicate via Bluetooth Low Energy with a near contact unit. Sensed values are stored in a server. Values are retrieved from the server, processed and analysed to produce an appropriate warning which is displayed on an end-device. Warnings are issued by a designed and validated wellness health score algorithm which combines gathered sensor readings.

Overall, it is found that the prototype system successfully enables end-users to be correctly notified of patient health conditions remotely and wirelessly in an acceptable timeframe. Further, the designed approach can be scaled to different medical contexts and environments.