A Bluetooth-Enabled, Dual-Sensor Device for Fetal Monitoring

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Abstract

Prenatal care is crucial to the health of both the expectant mother and the developing fetus. The ability to remotely monitor key pregnancy indicators can greatly enhance care delivery, especially in remote or underserved populations. In this paper, we present a novel remote medicine product that integrates two innovative sensors - a Doppler ultrasound fetal heart rate sensor and a tocodynamometer.

The Doppler ultrasound sensor provides non-invasive fetal heart rate monitoring, crucial for assessing fetal well-being and identifying potential complications. Meanwhile, the tocodynamometer offers an effective method of tracking uterine contractions, a key indicator of labor onset and progress. These two sensors work in synergy, offering a comprehensive remote monitoring system for prenatal care.

The sensors are connected to a centralized hub, designed with multiple functionalities. The hub delivers power to the sensors, facilitates sensitivity adjustments, and provides seamless Bluetooth communication. This design allows for real-time data transmission to healthcare providers, empowering timely intervention and decision-making.

The proposed system offers the potential of providing access to underserved populations to high-quality prenatal care. Its ease of use and potential for telemedicine integration can transform prenatal care delivery, bridging gaps, and improving health outcomes. The ensuing discussion will delve into the technical specifications of the product, its potential clinical applications, and its overall impact on remote healthcare delivery.

Biography of Presenter

Johnathan is currently a Ph.D. student at the University of Louisville. After graduating with a Master of Engineering in Electrical Engineering in August of 2022, he is working on his Ph.D. in Electrical Engineering while on a fellowship from the university. He has been involved with projects at UofL including the development of a digital carillon controller for the university's bell tower and the development of a healthcare wearable for nursing homes. Johnathan has received been the recipient of several awards at UofL including the Alfred T. Chen Memorial Scholarship and the Samuel T. Fife Scholarship.