Wireless Feto-maternal Vital Sign Monitoring and Follow-up for Resource Limited Setting

Dr. Rediet Adamu[1], Geletaw Sahle[2], Zegeye Kelkilew[3],Dr. Yeneneh Yirga[1] and Gizat Molla[4]

[1]Medical Doctor at JUSH Department of Surgery,, [2]Ph.D Fellow VUB, Belgium & Lec. JiT , [3] Senior Software Developer , [4] Ph.D and Research Assistant in University of South Australia

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Introduction

- Maternal and neonatal mortality related to childbirth is one of the big challenges of the developing world and its reduction is a key international development goal.
- Fetal heart rate, uterine contraction, maternal blood pressure, body temp, heart-rate and oxygen concentration are crucial in determining the wellbeing of a laboring mother and the fetus.
- Many of the defacto feto-maternal monitoring instruments such as Cardiotocography (CTG) are expensive, grid dependent and hard to maintain.
- Our idea is to construct a wireless feto-maternal vital sign monitoring and alerting system for low-resource setting.
- In which sensors are attached to a laboring mother non-invasively, collects vital sign data in real-time.
- After the real-time data is being processed by the rechargeable battery powered microprocessor and later sent for visualization in a wireless manner for a health care professional or a central nurse station.
- The visualization is based on the WHO standard known as the partogram which is a composite graphical depiction of key data during labor, which can be viewed by mobile phones, tablets and computers in a wireless manner.

Aims

Introduce a low cost, portable vital-sign monitoring device in low resource setting

- The device will promote an automated, accurate, and efficient vital sign collection.
- Sensors variety, cost and accuracy increased tremendously to attain low cost device
- 3D printing became more available and cheap

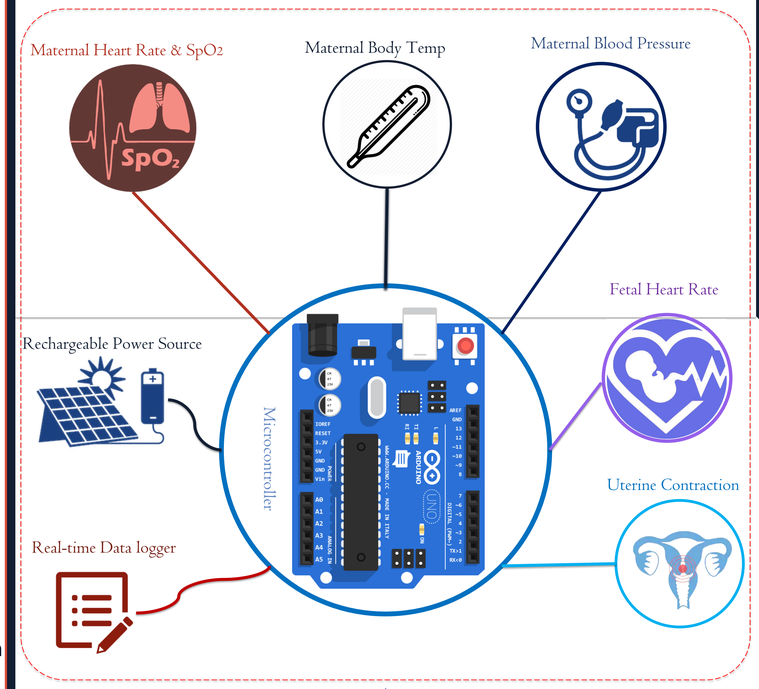
Assist the health care process by:

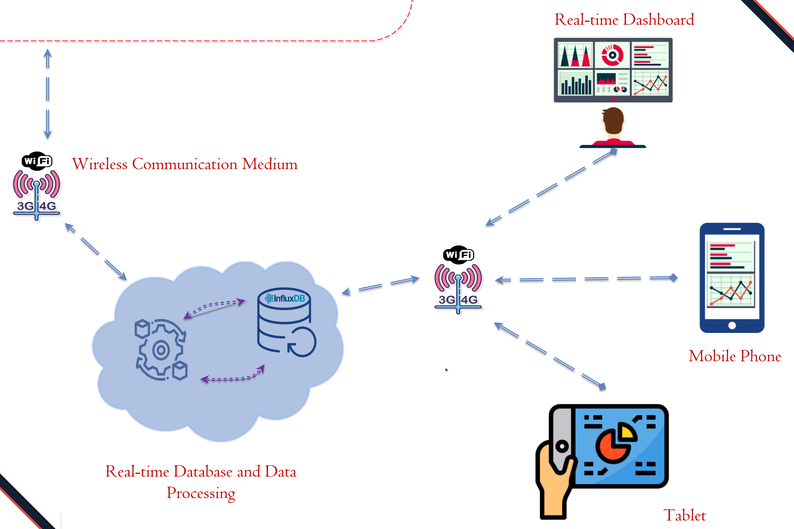
- Automating the vital-sign collection and monitoring based on Internet of Things.
- Reducing health care professional burnout
- Active alerting upon occurrence of risky vital signs

Deliver optimal care by:

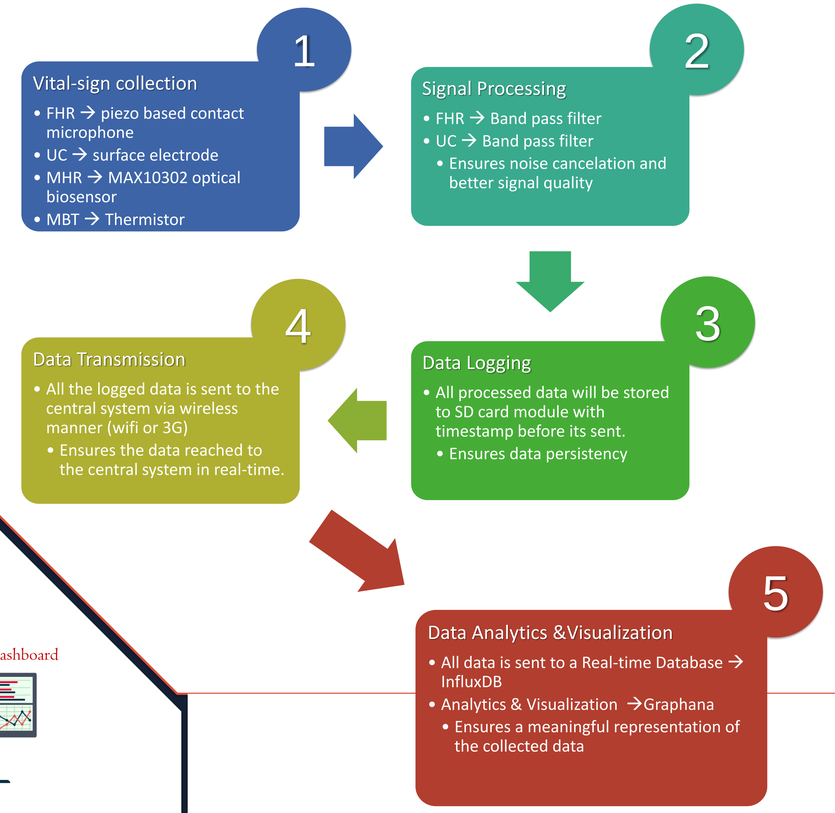
- Reducing errors in the vital-sign collection.
- Producing a real-time vital-sign data of the fetus and the mother to the health care professional at his/her vicinity.
- Minimizing cost of device ownership, and
- Improving patient outcomes

Hardware & Software Components





Method



Future Directions

- Integrate Cervical Dilatation optical measurement to the initial design.
- Integrate Artificial Intelligence for labor predication.
- Produce final all in one prototype.
- Large scale production of the device.
- Finding a business strategy for its sustainability.

Reference

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Contact: Dr. Rediet Adamu, rediet.adamug@gmail.com, Jimma University, Ethiopia.