

Faculty of Engineering

Summer Research Program 2023-2024

Project Title: A Multi-Sensor Technology for Newborn Health Monitoring

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Objective

This research aims to achieve objective, non-invasive and automated assessment of newborns, including, cardiac, respiratory, feeding and digestive health, with a compact versatile device. Our smart technology replaces the conventional stethoscopes to address the clinical needs in a non-invasive, reliable, and affordable way. This summer research will be focused on data analysis and developing signal processing and AI for our current prototype to achieve a more powerful signal processing and denoising, and more accurate health monitoring.

Project Details

Digital stethoscope can be used beyond its conventional application, particularly if coupled with extra sensors and powerful software for signal processing and AI. There exist great potentials for automated assessment of neonatal breath and heart sounds, bowel sounds, swallow and digestive function. An automated, non-invasive, compact, user-friendly device and software can help in the health assessment of preterm to full-term newborns and infants. This device can directly assess the sounds emanating from lungs, heart and bowels, while canceling the noise and interferences. We have developed prototypes which can be used to assess baby's swallowing and feeding. This project focuses on enhancements of our current prototypes. More specifically, it will be focused on advanced signal processing and AI to reduce the background noise and interference, separate the signals of interest and extract the useful clinical features. It may also involve design refinements, to reduce the physical size of our prototype.

Prerequisites

Engineering students, preferably competent with programming and signal processing and interested in AI.

Additional Information

Applicants may be required to attend an interview.