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ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2022-2023

Project Title: Enhancing fetal surveillance by monitoring fetal brain activity

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Objective

Delayed identification of foetal distress is a major cause of lifelong disability as well as unnecessary obstetric intervention, such as cerebral palsy which affects 34,000 Australians and costs our economy AUD5.2B/year. Improved clinical decision making through accurate and timely detection of foetal distress will have significant direct health benefits for our community and economy. This project fulfils this unmet need by offering a novel technique for monitoring foetal wellbeing and brain health by measuring foetal brain activity to detect fetal distress and risk of brain injury. This technique will result in an unprecedented advancement in obstetric care.

Project Details

We have recorded electroencephalogram (EEG) signals, brain blood flow, foetal movement data for three cohorts of lamb fetuses. Cohort 1 is extremely preterm lambs, who are exposed to fetal inflammation (chorioamnionitis). Cohort 2 is late preterm lambs exposed to acute hypoxia and Cohort 3 is late preterm lambs exposed to fetal inflammation. This project focuses on processing the recorded signals to remove the noise and interferences, and develop an Artificial Intelligence (AI) algorithm to automatically detect the abnormalities and assess brain health and general fetal wellbeing.

Prerequisites

Engineering students, preferably competent with programming, signal processing, machine learning, data science and artificial intelligence.

Additional Information

Applicants may be required to attend an interview.