



KUVEMPU UNIVERSITY

SHANKARAGATTA-577451

A Project Report on

**"EXTRACTION OF FETAL ELECTROCARDIOGRAM USING
ADAPTIVE NEURO-FUZZY INFERENCE SYSTEMS"**

(KSCST sponsored project)

*Dissertation submitted in partial fulfillment of the requirements
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BACHELOR OF ENGINEERING

in

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ABSTRACT

The fetal electrocardiogram (FECG) signal reflects the electrical activity of the fetal heart. It contains information about the health status of the fetus and therefore, an early diagnosis of any cardiac defects before delivery increases the effectiveness of the appropriate treatment. The use of adaptive neuro-fuzzy inference systems (ANFIS) for fetal electrocardiogram (FECG) extraction from two ECG signals recorded at the thoracic and abdominal areas of the mother's skin is investigated. The thoracic ECG is assumed to be almost completely maternal (MECG) while the abdominal ECG is considered to be composite as it contains both the mother's and the fetus ECG signals. The maternal component in the abdominal ECG signal is a nonlinearly transformed version of the MECG. An ANFIS network is used to identify the nonlinear relationship, and to align the MECG signal with the maternal component in the abdominal ECG signal. Thus, the FECG component is extracted by subtracting the aligned version of the MECG signal from the abdominal ECG signal.

The result shows the technique is capable of extracting the FECG even when it is totally embedded within the maternal QRS complex. Here, the normal and abnormality of the fetus is detected.