

Accurate, Non-Invasive Fetal Arterial Oxygen Saturation and Blood Ph Measurement via Diffuse Optics

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INVENTORS

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OTHER INFORMATION

KEYWORDS

fetal monitoring, non-

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oxygen saturation,

Transabdominal Fetal

Oximetry, Exponential

Pulsation Ratio, FOSTER,

signal processing, neural

networks, maternal-fetal

health

CATEGORIZED AS

Medical

Devices

Diagnostics

ABSTRACT

of California

Terms of use

Researchers at the University of California, Davis have developed non-invasive fetal monitoring that enables accurate, continuous measurement of fetal arterial blood oxygen saturation and blood pH.

FULL DESCRIPTION

This technology leverages Transabdominal Fetal Oximetry (TFO) to non-invasively monitor fetal well-being by accurately measuring fetal arterial blood oxygen saturation (fSpO2) and blood pH. The technology uses three key components: (1) a mathematical framework, (2) a signal processing pipeline, and (3) computational models to infer fetal blood pH from temporal dynamics of fSpO2. Together, these components overcome the fundamental challenges of non-invasive accurate intrapartum fetal monitoring, providing a significant advancement over traditional methods like cardiotocography.

APPLICATIONS

- ▶ Hospitals and birthing centers for intrapartum fetal monitoring.
- Research in fetal health and development.
- Integration into existing fetal monitoring systems to enhance their accuracy and reliability.
- ▶ Use in remote or low-resource settings where invasive monitoring is not feasible.

FEATURES/BENEFITS

- Continuously monitors fetal arterial blood oxygen saturation and pH non-invasively.
- ▶ Significantly improves accuracy over conventional methods.
- ▶ Reduces unnecessary interventions by providing reliable data on fetal distress.
- ▶ Leverages advanced signal processing techniques enhancing measurement reliability.
- ▶ First-of-its-kind technology to infer fetal blood pH non-invasively.
- Addresses high rate of false positives and unnecessary interventions (e.g., cesarean operations) in current fetal monitoring methods.
- Provides for lack of continuous, non-invasive monitoring of fetal blood pH and oxygen saturation.
- Overcomes difficulties in accurately isolating fetal signals from maternal-fetal mixed signals.

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ► Fetal Oximetry Measurement via Maternal Transabdominal Spectroscopy
- Method and System for Signal Separation in Wearable Sensors with Limited Data (with Applications to Transabdominal Fetal Oximetry)

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