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# 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-invasive, blood pH, oxygen saturation, Transabdominal Fetal Oximetry, Exponential Pulsation Ratio, FOSTER, signal processing, neural networks, maternal-fetal health

### CATEGORIZED AS

▶ **Medical**

    ▶ Devices

    ▶ Diagnostics

## ABSTRACT

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)

▶ Systems, Methods, and Media for Determining Fetal Photoplethysmography Information from Non-Invasively Obtained Mixed Photoplethysmography Signals