Automated Critical Congenital Heart Disease Screening Combining Non-Invasive Measurements of Oxygenation and Perfusion

Tech ID: 34612 / UC Case 2020-534-0

ABSTRACT

Researchers at the University of California, Davis have developed a computer-implemented method for accurately classifying congenital heart defects in newborns using pulse oximetry and machine learning.

FULL DESCRIPTION

This technology employs dual pulse oximetry to acquire physiological measurements from both upper and lower extremities of neonates. A predictive model, powered by machine learning, analyzes these measurements to identify potential critical congenital heart defects (CCHD). The model is trained using a vast dataset of neonatal physiological readings, incorporating advanced feature selection techniques to refine its diagnostic accuracy.

APPLICATIONS

- Hospital neonatal care units for routine CCHD screening.
- Pediatric cardiac diagnostic and treatment centers.
- Development of portable diagnostic devices for low-resource settings.
- Integration with healthcare IT systems for predictive analytics in neonatal care.

FEATURES/BENEFITS

- Enhanced early detection of CCHD, reducing mortality and morbidity.
- Non-invasive and real-time monitoring of neonatal cardiac health.
- Uses dual pulse oximetry for comprehensive physiological assessment.
- Machine learning model continuously improves with more data.
- Automated feature selection optimizes model accuracy and efficiency.
- Reduces the number of missed CCHD diagnoses in newborns.
- Minimizes the reliance on post-discharge diagnosis that can lead to increased risk.
- Addresses limitations of current oxygen-saturation based CCHD screening protocols.
- Improves detection of defects like coarctation of the aorta, often missed by conventional methods.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2023027706	09/07/2023	2020-534

CONTACT

Raj Gururajan
rgururajan@ucdavis.edu
tel: 530-754-7637.



INVENTORS

- Chuah, Chen-Nee
- Lai, Zhengfeng
- Lakshminrusimha, Satyan
- Siefkes, Heather

OTHER INFORMATION

KEYWORDS

automated feature selection, cardiac screening, critical congenital heart disease, dual pulse oximetry, machine learning, neonatal monitoring, non-invasive diagnosis, predictive model, pulse oximetry, real-time monitoring

CATEGORIZED AS

- **Medical**
  - Devices
  - Diagnostics
  - Disease: Blood and Lymphatic System
  - Disease: Cardiovascular and Circulatory System
  - Disease: Respiratory and Pulmonary System
  - Other

- Research Tools
- Screening

RELATED CASES

2020-534-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- A Method for Routing-assisted Traffic Monitoring

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel: 530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax: 530.754.7620

© 2026, The Regents of the University of California
Terms of use
Privacy Notice