

AI (Deep Learning) Diagnostic for Automated Analysis of Electrocardiograms

Tech ID: 34423 / UC Case 2025-181-0

INVENTION NOVELTY

This invention introduces a groundbreaking Foundation Model that achieves expert-level accuracy in ECG diagnostics across 68 conditions, leveraging deep learning to overcome the need for extensive labeled data and enabling advanced predictions in data-scarce environments.

VALUE PROPOSITION

UCSF’s advanced Foundation Model transforms ECG analysis by enabling expert-level accuracy across diverse diagnoses, reducing reliance on extensive labeled data, driving cost-effective innovation, and offering scalable solutions for early detection of heart dysfunctions in data-limited settings

TECHNOLOGY DESCRIPTION

Deep neural networks (DNNs) have been leveraged to automatically classify a variety of electrocardiogram (ECG) diagnoses, including rhythm abnormalities. However, for less common diagnoses, the challenge of obtaining sufficient high-quality labeled data has limited progress in medical AI. UCSF inventors addressed this by developing an advanced Foundation Model that leverages deep learning to analyze over 1.6 million ECGs, enabling automated predictions across 68 diagnostic labels from a single 12-lead ECG with expert-level accuracy. The model’s ability to diagnose high-quality ECG representations without relying on extensive labeled data reduces costs and accelerates innovation, especially in data-scarce environments. Designed for scalability and adaptability, this technology excels in low-data settings, supports fine-tuning for specialized tasks, and offers unique insights into longitudinal ECG changes to predict early heart dysfunctions.

APPLICATION

This technology can be applied to develop scalable diagnostic tools for early detection of heart dysfunctions, enable real-time clinical decision support in resource-limited settings, support personalized treatment planning through longitudinal ECG analysis, and accelerate research into rare cardiac conditions by overcoming data scarcity challenges.

LOOKING FOR PARTNERS

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OTHER INFORMATION

KEYWORDS

Foundation Model, ECG diagnostics, Expert-level accuracy, Deep learning in healthcare, Cardiac rhythm abnormalities, Scalable AI solutions, Data-scarce environments, Longitudinal ECG analysis, Early heart dysfunction detection, Medical AI innovation, Automated predictions, Biotech AI applications, Cost-effective healthcare technology, Predictive analytics in cardiology, Biotechnology breakthroughs, Clinical decision support, Advanced

We are seeking strategic partners in the medical device, biotechnology, and AI sectors to collaborate on advancing and deploying our revolutionary Foundation Model for scalable, cost-effective ECG diagnostics and early detection of heart dysfunctions.

RELATED MATERIALS

► [A deep foundation model for electrocardiogram interpretation: enabling rare disease detection through transfer learning.](#) doi: 10.1016/j.jchf.2024.12.007. PMID: 40146086 - 05/21/2025

PATENT STATUS

Patent Pending

diagnostic tools, 12-lead
ECG analysis

CATEGORIZED AS

- Medical
 - Diagnostics
 - Disease: Cardiovascular and Circulatory System

RELATED CASES

2025-181-0

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