Opportunity

Cardiovascular disease is a leading cause of death worldwide, responsible for an estimated 18 million deaths each year, with cardiac arrhythmia being a significant subclass. Cardiac arrhythmias are characterized by an irregular heart rate or rhythm, which can lead to serious complications such as stroke and heart failure. Early detection of arrhythmia is crucial for cardiovascular health. Electrocardiograph (ECG) monitoring is a well-established method for detecting heart problems by measuring the electrical activity of the heart. There is a significant opportunity to improve the accuracy and efficiency of ECG monitoring to better detect and manage cardiac arrhythmias.

Technology

Introducing our breakthrough technology, a system for compact wearable ECG monitoring devices that employs AI-based deep learning algorithms for accurate, real-time diagnosis. The system effectively removes noise and reduces computational complexity, improving data collection accuracy from wearable device and increasing disease detection probability.

The two-stage convolutional neural networks (CNN) architecture is designed to work with wearable devices, providing a highly accurate diagnosis even in the presence of noise. The extended period of monitoring, up to 2 weeks, allows medical practitioners to obtain a comprehensive view of the patient's cardiac rhythm patterns.

The system is sufficiently computationally efficient to be implemented on an edge/network access device (e.g. router), reducing the number of trainable parameters compared to existing solutions. The system further reduces computational requirements by selecting a number of coefficients from the treated signal rather than a reconstructed signal.

This technology can provide clinicians with more valuable insights into patients' cardiac rhythm patterns, leading to more effective treatment plans and improved overall health outcomes.

Potential Commercial Applications

The market for wearable ECG monitoring devices is expected to continue to grow at a high CAGR. Devices utilizing our system can provide more efficient and accurate, real-time diagnosis and monitoring over an extended period so have the potential to significantly improve patient outcomes by enabling early intervention and prevention of serious complications.

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Intellectual Property Status

This IP is wholly Sydney-owned and is protected by PCT application No. PCT/AU2023/050443.

Proof of Concept → Pre-Clinical → Clinical