

IIT-Hyderabad device can scan ECG for heart disease

Hyderabad: Researchers from IIT-Hyderabad have designed a device to diagnose medical conditions from real-time ECG data. The low-power device can, according to a release from the institute, scan monitor electrocardiogram (ECG) data and alert patients and doctors in real time about the risk of cardiovascular disease (CVD).

The team of researchers comprising Vemishetty Naresh, a PhD research scholar, Advanced Embedded Systems and IC Design Laboratory at IIT-H's department of electrical engineering, and Dr Amit Acharayya, associate professor, validated their method on healthy and unhealthy cases from the Physionet database. Their research has been published in the international journal Scientific Reports.

Dr Acharayya said, "CVD is one of the deadliest diseases. It manifests in different forms, necessitating early diagnosis, therapy and prognosis. The proposed work on the classification will be of immense help to the society." The team of researchers has also worked on developing classification techniques to make a generic algorithm. The system-on-chip (SoC) architecture has been developed in a way that the system can cover various ECG abnormalities to come up with a prototype board that looks similar to a smartphone.

The researchers have overcome challenges of keeping power consumption and complexity low with their novel SoC architecture. They have proposed certain technical features which were stated in a press note as "a low-complex boundary detection (BD) and feature extraction (FE), low-complex f-QRS detection and morphology identification (FDMI) architecture, rule engine (RE), and token-based compression technique." These methodologies will allow the system to compare ECB beats with standard values to make a binary classification of 'normal' and 'abnormal.'

Since the aim is to have real-time classification in environments of scarce power and area, the system is of low complexity/

This work was partly supported by the centre's department of science and technology (DST), under the 'Internet of Things (IoT) research of interdisciplinary cyber physical systems (ICPS) programme,' under the project entitled 'IOT-based holistic prevention and prediction of CVD (i-PREACT).'

Cardiologists state that they would need to conduct studies to understand how it will help.

These are initial stages and implementation at the patient level will take time.

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