Biophonics

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ENABLING WIDESPREAD EARLY DETECTION OF VALVULAR HEART DISEASE WITH A UNIQUE MEDICAL DEVICE

Website

Overview

Nearly 2 million people in the UK suffer from significant valvular heart disease, yet more than half remain undiagnosed.

Biophonics are a spin-out from the Acoustics Lab in Cambridge University Engineering Department, combining world-leading AI and acoustics to design a unique screening device for valvular heart disease. Our device will enable community screening to be carried out by a non-skilled operator, detecting cases at an early stage and preventing costly late intervention due to heart failure

The Challenge

Valvular heart disease (VHD) is the next cardiac epidemic. One in nine over 65s suffer from clinically significant VHD, yet more than half of these cases remain undiagnosed. Patients detected at a late stage have a worse prognosis than advanced stage cancer and cost the NHS an additional £345m per year.

The only current tool available to GP is a stethoscope, which is infrequently used

and inaccurate, with half of cases being missed and inappropriate referrals to hospital cardiology. Hospitals are overstretched by both long waiting lists (6-8 months at Addenbrooke's) and patients arriving at A&E with heart failure.

The Solution

We are designing an acoustic screening device to enable quick and accurate screening of valvular heart disease. It consists of two key technologies: (i) a novel acoustic sensor that makes recording heart sounds easy and straightforward and (ii) world-leading AI algorithms and data to detect clinically significant VHD. Our solution is the only technology that does not require expert training to provide an accurate diagnosis.

As a first use case, our device can be deployed in GP practices and pharmacies, used by nurses or pharmacists to more accurately refer patients to hospital. This will reduce waiting lists of NHS trusts whilst improving patient prognoses.

Publications and Patents

Patent:

- Smart Stethoscopes, WIPO Patent Number: WO2019/171021 A1 (Pending)

Publication:

- McDonald, A., Gales, M., Agarwal, A., Detection of Heart Murmurs in Phonocardiograms with Parallel Hidden Semi-Markov Models, Computers in Cardiology, 2022

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