Researchers develop mobile app to record the sound of a beating heart

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Researchers from King's College London's School of Biomedical Engineering & Imaging Sciences, Maastricht University and designers from Cellule design studio with testing support from ECHO and the British Heart Foundation (BHF), have created a one-of-a kind app, *Echoes*, which records the beating of a user's heart.

Samantha Johnson, CEO at ECHO, said:

> *"At ECHO, we are keen to explore how digital tools such as Echoes make knowledge accessible for as many heart families as possible. By using the app we hope that parents, carers and children can learn about their heart, have fun exploring with recording the sounds of their heart and feel connected to those they choose to share them with."*

How can I use the *Echoes* app?

Using the app, you can place your phone on your chest and hear and visualise the beauty of your heartbeat, or your loved ones heatbeats.

Save and choose a name for your recording and you can observe your heart sounds evolving, for example when doing different activities like post-exercise or when relaxing with family.

Currently, the app can only be downloaded onto Apple iPhone devices, an Android version is under development.

How will my recordings be used?

Every app user will contribute to an anonymous online archive at King's College London, helping researchers to understand the limits of heart disease diagnosis through mobile technologies.

Whether you are someone with a heart condition, a relative, parent or carer or someone with an interest in simply taking part and hearing their own heartbeat, *Echoes* is a tool you can use to help science learn about the heart and enjoy your own heartbeat recordings in a beautiful and playful way.

Why was the *Echoes* app developed?

Heart researcher at the School of Biomedical Engineering & Imaging Sciences, Professor Pablo Lamata said the interest in the app originated from his work which seeks to improve the management of aortic stenosis, narrowing of the outlet valve of the left ventricle.

> *"The vision for Echoes is that instead of having to rely solely on hospital visits and the anxiety that may bring, we could potentially routinely monitor these valves from home."*

If the research shows that mobile technologies are a viable way of recording heart sounds, in the future, cardiac patients and doctors could use at-home recordings to check for sudden or significant changes.

PhD student at Maastricht University Honxing Luo said due to the widespread use of mobile phones, technologies and applications can reach a wider range of general population, which would be a possible way of improving the general public's awareness of heart disease.

> *"Echoes uses heart sound to improve patient's treatment response. With such apps, we foresee a much wider coverage of the public, regardless of their ethnicity, nationality, skin color, height or weight. The beauty of the Internet lies in its equality to promote knowledge to anyone who wants it and our app surely shows this."*

You can visit the Echoes App website to find out more about it.

Who is involved?

At ECHO we would like to thank all of our members who kindly gave their time and experience to take part in workshops prior to the app's launch to talk about their ideas and give feedback to the researchers and developers to help them shape the app. Thank you!

The initial idea for using smartphones to record heart sounds came from Mr Luo, working with research leader Frits Prinzen, who began developing the algorithm which grew into the app through his work on the EU-funded PIC project.

Professor Pablo Lamata who coordinates PIC, approached design studio Cellule to build on this and create *Echoes*.

Echoes was developed by a team of researchers working across King's College London and Maastricht University, along with the team at Cellule design studio, with input and testing from ECHO and BHF

and funding from Wellcome and from the European Union through the Marie Skłodowska-Curie Actions PIC project.