

# PRESS RELEASE

## Cases no longer slip through the net: New app by Fraunhofer IGD detects heart disease earlier

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**The 24-hour ECG as a standard method of diagnosing heart disease can miss any irregularities that occur with lesser frequency. For sufferers, this often results in a lengthy odyssey until they finally obtain a proper diagnosis and are put on a suitable course of treatment. A team of researchers at Fraunhofer IGD in Rostock is seeking to plug this gap in diagnostics. The Guardio® health app enables users to perform multichannel ECGs without electrodes being attached to their skin and to detect heart disease much earlier than with conventional methods.**

According to statistics produced by the Robert Koch Institute, heart disease is one of the most common causes of death in Germany, and the current state of diagnostics leaves a lot to be desired. It can take up to ten years before a patient with heart-related problems obtains a definitive diagnosis. Fraunhofer researcher Dr. Marian Haescher explains: "People who go to the doctor with heart problems will usually be put on a 24-hour ECG. We have been told by cardiologists that the chance of producing a correct diagnosis, for example of atrial fibrillation as a potential cause of stroke, is a mere five percent." The reason for this is that the period of measurement - specifically 24 hours - is too short, given that arrhythmias of the heart can occur much less frequently. Long waiting times for an appointment with a specialist exacerbate the situation.

Haescher and his colleagues at the Fraunhofer Institute for Computer Graphics Research IGD in Rostock have developed an artificial intelligence app that can measure heart movements, from which information about coronary health can be derived. This information is then displayed in a number of different ways. The means by which the AI is supplied with data is flexible, with one option being the acceleration sensors built into every smartphone. The Guardio® health app guides users step by step through the process of measuring their own heart activity. Setup, which takes just 30 seconds, is convenient and, above all, does not require the attachment of electrodes to the skin. This enables repeated measurements over a

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longer period of time or alternatively a precise snapshot, e.g. when symptoms such as shortness of breath or palpitations occur. The development team has come up with a novel and uncomplicated way for patients to monitor their own heart health reliably and spontaneously. Haescher emphasizes, however, that the aim is not to facilitate home diagnosis. Consequently, the program “translates” the collected data into a standard ECG which is then evaluated by a qualified cardiologist, because “diagnostic sovereignty must always remain with the medical professionals.” Guardio® is plugging a critical gap in diagnostics, as Professor Dietmar Bänsch, Medical Director and Head Physician of Rhythmology at KMG Klinikum in Güstrow, explains: “A record of multichannel ECGs that is instantly accessible at any time - such as Guardio® provides - would constitute an absolute breakthrough in the diagnosis of cardiac arrhythmias.”

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It is also conceivable that the technology could be used on incubators for new-born infants, because data acquisition via Doppler radar allows heart movements to be recorded without contact, which is obviously advantageous in this case. The sensors installed as standard in modern smartwatches would also permit them to be used for recording an ECG, albeit with one major shortcoming: “Smartwatches would only be able to record a single-channel ECG, but our evaluations have the same informative value as a multi-channel ECG and can therefore detect significantly more instances of heart disease.” Cardiologist Dr. Grit Nonnemann concurs: “I think Guardio is a very good tool for filtering out asymptomatic patients, who can thus be saved from cerebral infarctions, and for verifying arrhythmias in symptomatic patients without further aids.”

The research team is working with cardiologists and rhythmologists at Güstrow to optimize the technology on which Guardio® is based. They plan to found a start-up to exploit the idea in early 2023. After obtaining medical device certification, they hope that their technology will soon thereafter be finding its way to patients as a digital health application, either reimbursed by health insurers or as a tool in the private-payer model.

FRAUNHOFER INSTITUTE FOR COMPUTER GRAPHICS RESEARCH IGD

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**For more information:**

More about Guardio®:

<https://guardio.health/en>

More about Fraunhofer IGD's healthcare research:

[www.igd.fraunhofer.de/de/branchen/gesundheit.html](http://www.igd.fraunhofer.de/de/branchen/gesundheit.html)

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Image Caption: Fraunhofer IGD's Guardio® app records heart movements and translates them into a multi-channel ECG. (© Fraunhofer IGD)

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## About Fraunhofer IGD

Since 1987, the Fraunhofer Institute for Computer Graphics Research IGD has been setting international standards for applied research in visual computing, the branch of computer science that deals with images and 3D models. We transform information into images as well as images into information, and we support industry and business in their strategic development. Keywords here are human-machine interaction, virtual and augmented reality, artificial intelligence, interactive simulation, modeling, 3D printing and 3D scanning. Around 180 research staff at the three sites in Darmstadt, Rostock and Kiel are generating new technological application solutions and prototypes for Industry 4.0, digital healthcare and the smart city. Our products take on international relevance through our partnership with the sister institute in Graz and Klagenfurt. Our matrix organization enables us to serve our clientele from a wide range of industries with technical and competitive services relevant to their needs. For this purpose, we have assembled cross-functional teams of experts with extensive industry experience, who also take on planning, management and evaluation responsibilities for projects of any magnitude.

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