PRESS RELEASE

Decentralized monitoring of COVID-19 patients: M³Infekt project launched

Erlangen: M³Infekt, a Fraunhofer cluster project, aims to develop a monitoring system that enables early intervention in the event that a patient's condition suddenly starts to deteriorate. It will be a modular, multimodal and mobile system, and will also be suitable for use in the treatment of COVID-19 patients. By facilitating the required intervention at an early stage, the system helps to lessen the effects of disease, shorten the duration of therapy and make flexible use of intensive care wards.

Quick and reliable diagnosis of disease progression

The coronavirus pandemic poses a challenge for medical diagnostics. Alongside serious cases, the SARS-CoV2 virus also causes mild symptoms, but these can very quickly worsen. Currently, however, continuous patient monitoring is available only on intensive care wards. When someone's health suddenly deteriorates, there is often some delay to this being recognized, meaning the patient is taken to hospital too late. This is precisely where the M³Infekt cluster project comes in. Using various technologies, the mobile system acquires, analyzes and fuses relevant biosignals, which enables a valid diagnosis to be made of the patient's condition and the progression of the disease.

The idea is to provide a long-term solution for decentralized monitoring of patients on normal wards and in non-hospital environments using multimodal parameters of the cardiovascular system (including heart rate, ECG, oxygen saturation, blood flow) and respiratory parameters (including respiratory rate/volume, breath analysis). Machine learning methods serve as the basis for evaluating these parameters, facilitating diagnosis and enabling integration of the system into different deployment and application scenarios, regardless of location.

Affordable healthcare benefits patients and health services

The planned system has a modular and mobile structure with standardized, open interfaces. These enable easy integration into other platforms and make the system suitable for use with various diseases, including influenza, pneumonia and sepsis. It will enable continuous monitoring, previously used only for patients in intensive care, to be rolled out to non-hospital scenarios, such as short- and long-term care, outpatient treatment or home settings. This way, patients can remain in a favorable environment and move to a hospital only if their condition suddenly deteriorates.

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Fraunhofer IIS is the project lead in the M³Infekt consortium, which comprises ten Fraunhofer Institutes and four medical partners. Together, they form an interdisciplinary group built on complementary areas of expertise.

In particular, Fraunhofer IIS brings to the table its core competences in developing textile-based sensor technology and wearables and in implementing AI methods on affordable, low-power embedded platforms.

The M³Infekt project is funded as part of the Fraunhofer-Gesellschaft's internal programs.

Partners Fraunhofer

Fraunhofer Institute for Integrated Circuits IIS, Division Smart Sensing and Electronics, Division Engineering of Adaptive Systems
Fraunhofer Institute for Photonic Microsystems IPMS
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Clinical partners

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Charité – Universitätsmedizin Berlin
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The **Fraunhofer Institute for Integrated Circuits IIS**, headquartered in Erlangen, Germany, is a world leader in research on microelectronic and IT system solutions and services. Today, it is the largest institute of the Fraunhofer-Gesellschaft. Research at Fraunhofer IIS revolves around two guiding topics:

In the area of "**Audio and Media Technologies**," the institute has been shaping the digitalization of media for more than 30 years now. Fraunhofer IIS was instrumental in the development of mp3 and AAC and played a significant role in the digitalization of the cinema. Current developments are opening up whole new sound worlds and are being used in virtual reality, automotive sound systems, mobile telephony, streaming and broadcasting.

In the context of "**cognitive sensor technologies**," the institute researches technologies for sensor technology, data transmission technology, data analysis methods and the exploitation of data as part of

data-driven services and their accompanying business models. This adds a cognitive component to the function of the conventional "smart" sensor.
More than 1100 employees conduct contract research for industry, the service sector and public authorities. Founded in 1985, Fraunhofer IIS now has 14 locations in 11 cities: Erlangen (headquarters), Nürnberg, Fürth and Dresden, as well as Bamberg, Waischenfeld, Coburg, Würzburg, Ilmenau, Deggendorf and Passau. The budget of 169.9 million euros a year is mainly financed by contract research projects; 26 percent of the budget is made up of German federal and state funds.
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