



PRESS BRIEFING

Decentralized monitoring of COVID-19 patients: M³Infekt project launched

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 EMFT researches and develops sensor systems and actuators for people and the environment at its locations in Munich, Oberpfaffenhofen and Regensburg. The competences of the approx. 130 employees include manufacturing-oriented microtechnologies, innovative sensor solutions, microdosing and secure electronics.

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.

Fraunhofer EMFT contributes to the project with its expertise in sensor systems and flexible electronics. During the project a sensor bracelet shall be developed, for continuous monitoring of multimodal biosignals. This data is then transmitted online and stored in a central database, for analysis using AI methods, such as machine learning, and further processing.

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
- Fraunhofer Institute for Ceramic Technologies and Systems IKTS
- Fraunhofer Institute for Electronic Nano Systems ENAS
- Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR
- Fraunhofer Institute for Nondestructive Testing IZFP
- Fraunhofer Institute for Structural Durability and System Reliability LBF
- Fraunhofer Research Institution for Microsystems and Solid State Technologies EMFT
- Fraunhofer Project Hub for Microelectronic and Optical Systems for Biomedicine MEOS

Clinical partners

- Klinikum Magdeburg
- Charité – Universitätsmedizin Berlin
- Universitätsklinikum Erlangen
- Universitätsklinikum Dresden