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“Access checker” remotely measures body temperature in addition to heart and breathing rate

An innovative measurement method is helping to detect people infected with coronavirus from a safe distance. It detects fever, increased pulse rates and fast breathing without endangering the person conducting the testing. Fraunhofer IPA and Fraunhofer IAO are currently testing the procedure at the Robert Bosch Hospital in Stuttgart.

Hospitals are presently obliged to maintain entrance controls. Given the spread of coronavirus, it is essential to ensure that patients, hospital staff and visitors are not carrying the virus into the hospital and thereby endangering people who already have compromised immune systems. In front of the main entrance of the Robert Bosch Hospital (RBK) in Stuttgart, Fraunhofer IPA and Fraunhofer IAO, together with the RBK, are currently testing a procedure that is set to simplify these controls. The innovative method developed by the Fraunhofer Institute for Manufacturing Engineering and Automation IPA measures all the relevant parameters from a distance of one meter. The professional carrying out the test via a laptop is able to maintain the required minimum distance of 1.5–2 meters without a problem. As a result, they are not put at risk and do not need to wear any PPE. This is an invaluable advantage in these present times, when not even basic face masks are available in sufficient quantities.



Dr. med. Urs Schneider from Fraunhofer IPA explains the test procedure.
Source: Robert Bosch Hospital/
Christoph Schmidt

BY COOPERATING WITH


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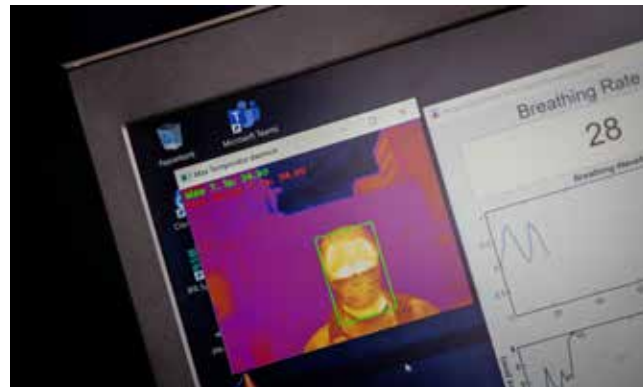
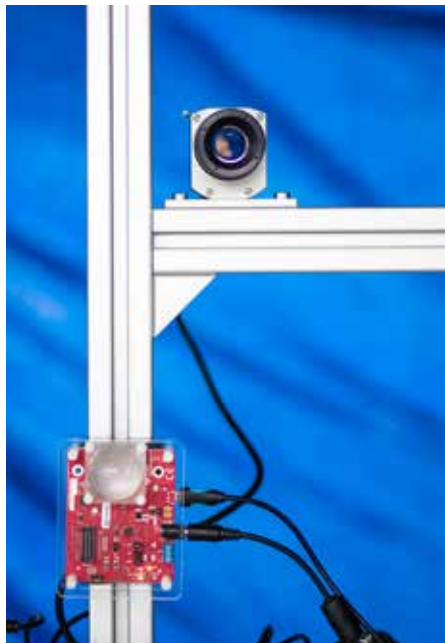
Infrared camera and radar measure vital parameters

The test measures not only body temperature using an infrared camera but also heart and breathing rates by way of microwaves. To this end, a radar module featuring a micro-Doppler method is used. The research team is now examining on site whether and how precisely the testing procedure correlates with the data collected from hospital staff in the entrance area and whether the procedure is practical. The test was developed within a matter of weeks and should play a part in curbing the coronavirus pandemic as quickly as possible: A team headed up by Dr. Urs Schneider, a medical professional who works at Fraunhofer IPA, has many years of experience in areas such as occupational health and safety, medical technology, image processing and object recognition. As a result, it has an excellent grasp of all the necessary testing procedures.

The staff at the Fraunhofer Institute for Industrial Engineering IAO are responsible for ensuring the ideal process integration of Fraunhofer IPA's technological innovation. In this context, the scientists are analyzing its usability for hospital staff and patients as well as, above all, movement patterns of patients and treatment chains using a contactless movement sensor. The aim is to soon integrate this technology into the hospital's admission process.

The medics, engineers and labor organization experts have now applied their expertise to help in the efforts to deal with the coronavirus crisis. They have put together a prototype at an astonishing speed. They have even considered data protection: The patients' data is not stored but rather anonymously documented on a paper spreadsheet.

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Top: Detail of test evaluation with infrared image of the face and breath.

Left: Test device with infrared camera and microwave transmitters and receptors.

Source: Robert Bosch Hospital/Christoph Schmidt

FRAUNHOFER INSTITUTE FOR MANUFACTURING ENGINEERING AND AUTOMATION IPA**Initial tests successful**

The first trial run is now being carried out in conjunction with Dr. Christoph Wasser, who is Medical Director ER at the Robert Bosch Hospital. The automated examination is as quick as the usual procedure. It remains to be seen whether fewer staff are also required to carry out the procedures. There is huge interest in the mobile “access checker”. Other institutes such as Tübingen University Hospital and several coronavirus screening checkpoints in the area are also keen to use the new test method. Fraunhofer IPA plans to build four more systems within just two weeks and has also applied for a patent. Schneider says: “We are convinced that we have developed a sound concept that can also be used when the coronavirus crisis is over.” He highlights that the test can be used not only by hospitals and care homes but also at airports and other important establishments. After all, the world will always suffer pandemics.

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Fraunhofer IPA's Dr. med. Urs Schneider conducts the test method on a test subject.
Source: Robert Bosch Hospital/Christoph Schmidt

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With nearly 1000 employees, the **Fraunhofer Institute for Manufacturing Engineering and Automation IPA**, Fraunhofer IPA, is one of the largest institutes in the Fraunhofer-Gesellschaft. The total budget amounts to € 74 million. The institute's research focus is on organizational and technological aspects of production. We develop, test and implement not only components, devices and methods, but also entire machines and manufacturing plants. Our 15 departments are coordinated via six business units, which together conduct interdisciplinary work with the following industries: automotive, machinery and equipment industry, electronics and microsystems, energy, medical engineering and biotechnology as well as process industry. The research activities of Fraunhofer IPA aim at the economic production of sustainable and personalized products.