

FRAUNHOFER INSTITUTE FOR  
INTEGRATED CIRCUITS IIS

**TOUCH-SENSITIVE TEXTILE SURFACES  
FOR INTELLIGENT HOME AND WORK  
ENVIRONMENTS**



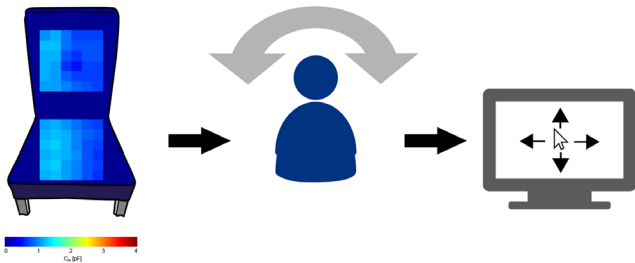
# SMART SENSORS IN SEATING AND RECLINING SURFACES

The intelligent chair combines discreet sensor technology for recording capacitive signals and robust, real-time-capable algorithms for deriving control signals.

It uses a total of 72 capacitive proximity sensors integrated in the seating surface and backrest to collect information such as the user's seating position and movement. Much like a touchscreen, the sensors register everything that approaches them in real time. The person seated in the chair controls the mouse cursor on the PC by shifting their weight. The miniaturized sensor and evaluation electronics can be integrated in seating furniture, vehicles, and reclining surfaces.

## **Mutual-capacitance method**

The matrix of capacitive sensor fields arranged in the seating surface and backrest of the intelligent chair react precisely to changes in the electric field (e.g. through pressure loads on the seating area), thereby also enabling the system to map the exact weight distribution of the person seated there. The resulting measurement data are transmitted via Bluetooth or Bluetooth Low Energy directly to an output device and used to control the mouse cursor.



1

## Possible application areas

- Assistance system to support disabled persons
- Rehabilitation measures as incentive for physical activity
- Prophylactic measures to prevent musculoskeletal disorders
- Serious gaming to build motor and cognitive skills
- Media Control
- Mobile gaming in motor vehicles and aircraft

## Technical details

- Integration of fabric sensor fields in chair backrests and seating surfaces to record pressure loads and approaching motions
- Real-time interpretation of incoming signals to control the mouse cursor
- Transmission of sensor data via Bluetooth or Bluetooth Low Energy technology
- Sensor thickness approx. 1 mm

*1 Schematic presentation of resulting sensor signals caused by movements or position changes and derived control command*

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*The »intelligent chair« is not yet certified as a medical device.  
Fraunhofer IIS is presenting the »intelligent chair« with the goal of attracting partners for the further development, production and marketing of the technology.*

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