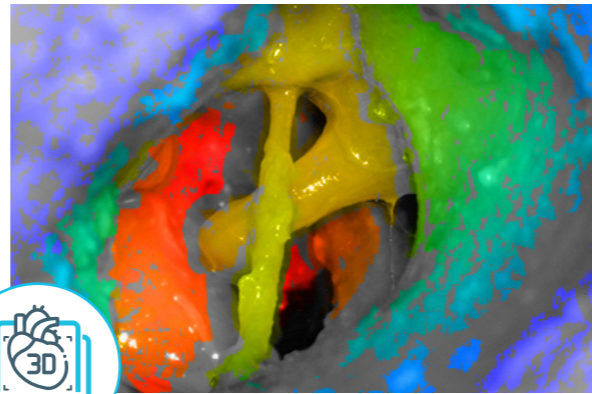


# Medicine at Fraunhofer HHI

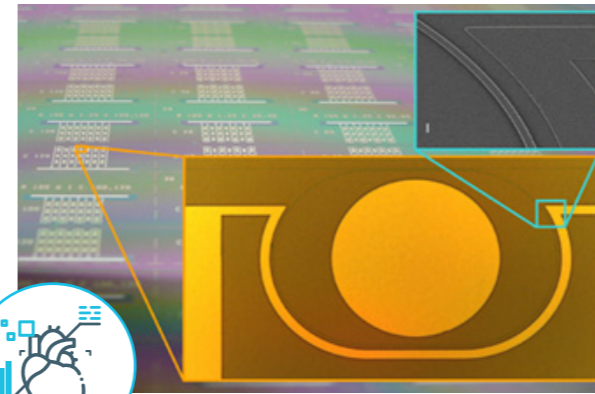
Whether in the operating, laboratory or treatment room, modern medicine without digital assistance systems and signal processing is barely imaginable anymore. Imaging procedures, computer-assisted surgical systems and new diagnostic options support the doctor and enable new forms of treatment. The Fraunhofer HHI offers a wide range of technological expertise and combines them in the field of medical technology.

## Competencies at Fraunhofer HHI



### Intraoperative image analysis

- Endoscopic and microscopic 3D analysis and measurement
- 3D instrument tracking
- Recording and modelling of organ and tissue movements
- Multispectral tissue analysis
- Intraoperative Augmented Reality (AR) visualization



### Medical signal analysis

- Modelling and evaluation of ECG, EEG and ultrasonic signals
- Low radiation CT reconstruction
- Point-of-care diagnostics: Microrings for detection of biomolecules in liquids, e.g. in blood
- AI-based diagnostic support
- Quality standards for data algorithms and standardization



### Assistance systems

- Sterile, contactless operation of medical devices
- Virtual Reality (VR)-based rehabilitation of cognitive disorders
- Intraoperative AR visualization of additional information (3D measurement data, tissue types, vital signs, preoperative image data)
- Preparation and analysis tools for medical 2D and 3D image data
- Data visualization for control room and patient monitors
- Teaching and training support

### Applications

- AR-assisted surgery
- Endoscopic 3D cavity reconstruction and 3D panorama creation
- Personalized medicine such as the intraoperative implant measurement, e.g. in ossiculoplasty
- Navigated surgery
- Analysis of time series data (ECG, EEG, fMRI)
- Evaluation of histopathological images for the detection of lymph node cancer
- Detection of heart attacks with neuronal networking
- Gait analysis

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