

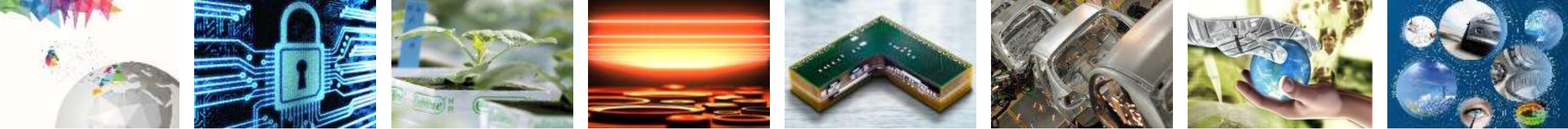


# FRAUNHOFER PORTUGAL AICOS

Research Center for Assistive Information and Communication Solutions  
APPLIED SCIENCE BY FRAUNHOFER – MADE IN PORTUGAL

# Fraunhofer Portugal

Fraunhofer – Gesellschaft



- Innovation Research
- Information and Communication Technology
- Life Sciences
- Light & Surfaces
- Microelectronics
- Production
- Defense and Security
- Materials and Components

**74** Institutes

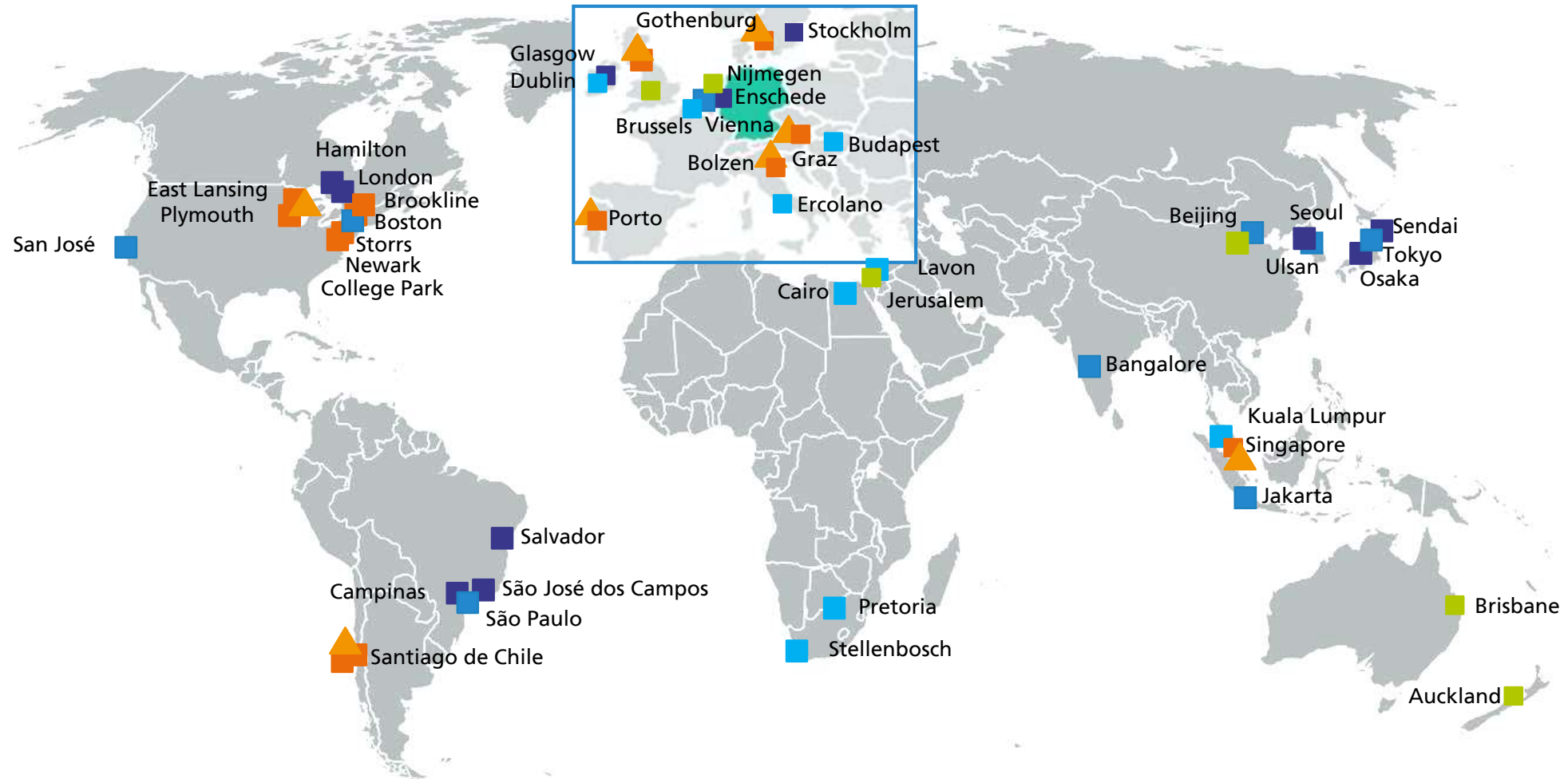
> **80** Research Units

> **28,000** Employees

> **€ 2.8 billion** R&D Budget  
(€ 2.3 billion contract research)

# Fraunhofer Portugal

Fraunhofer – Gesellschaft



▲ Subsidiary    ■ Center    ■ Project Center    ■ ICON/Strategic Cooperation    ■ Representative/Marketing Office    ■ Senior Advisor

# Fraunhofer Portugal

## Institutional Background

### ASSOCIAÇÃO FRAUNHOFER PORTUGAL RESEARCH

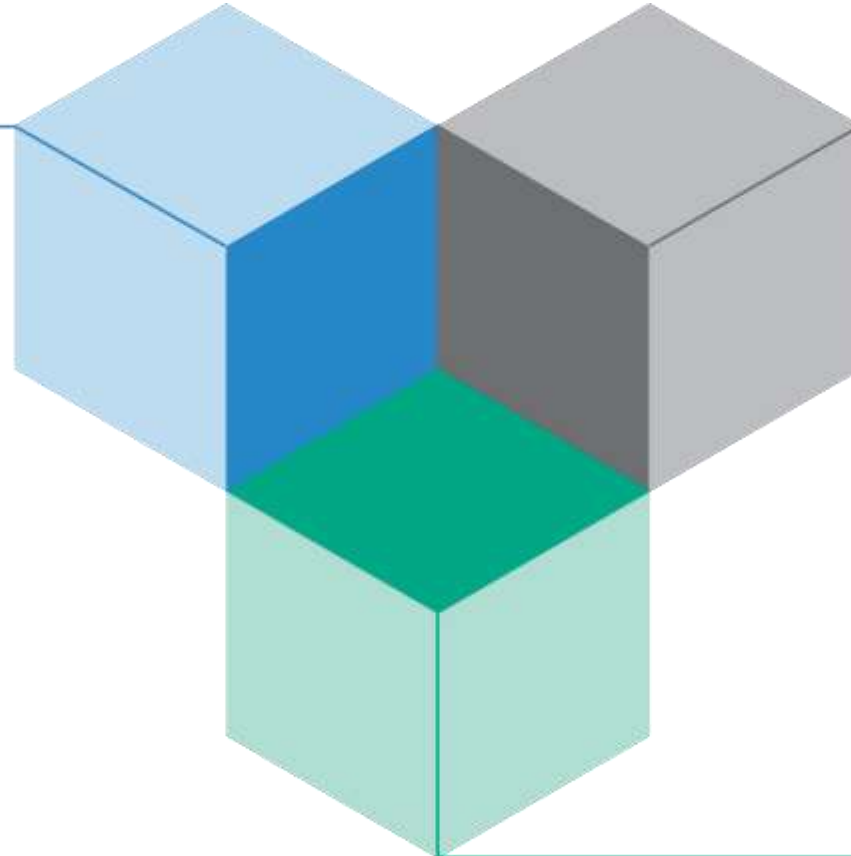


# Fraunhofer Portugal

Fraunhofer Operational Model and Technology Transfer

**BASE FUNDING**

~1/3 Revenues



**DIRECT INDUSTRY  
CONTRACTS**

~1/3 Revenues

**NATIONAL /  
INTERNATIONAL  
R&D PROGRAMMES**

~1/3 Revenues

# Fraunhofer AICOS

## Vision and Mission

We create cutting-edge innovation based on end-user insights.

**PROPOSING FUTURES.  
IMPACTING LIVES.**

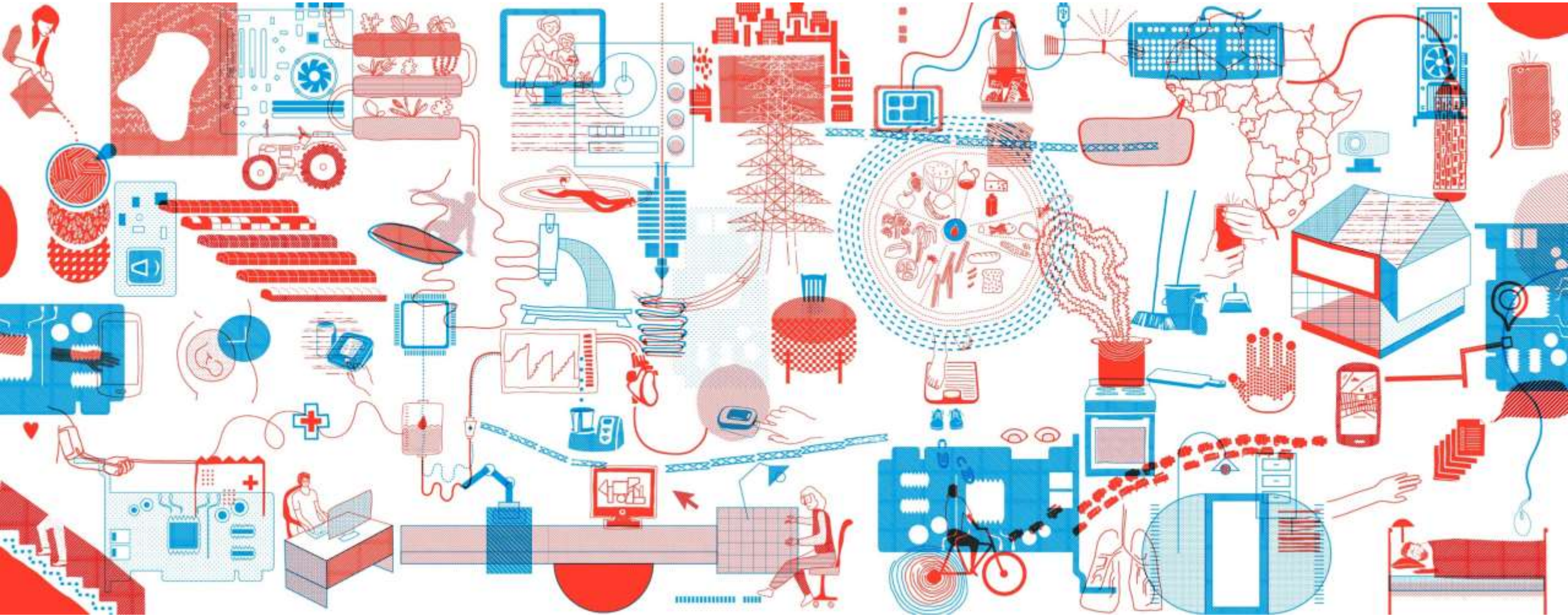
**REMARKABLE TECHNOLOGY,  
EASY TO USE**

As a leading partner for industry, we create applied research solutions capable of contributing to the market success of our clients' products and services by focusing on the value for their customers.



# Fraunhofer AICOS

Our Approach – Combining three perspectives in every challenge: People, **Things**







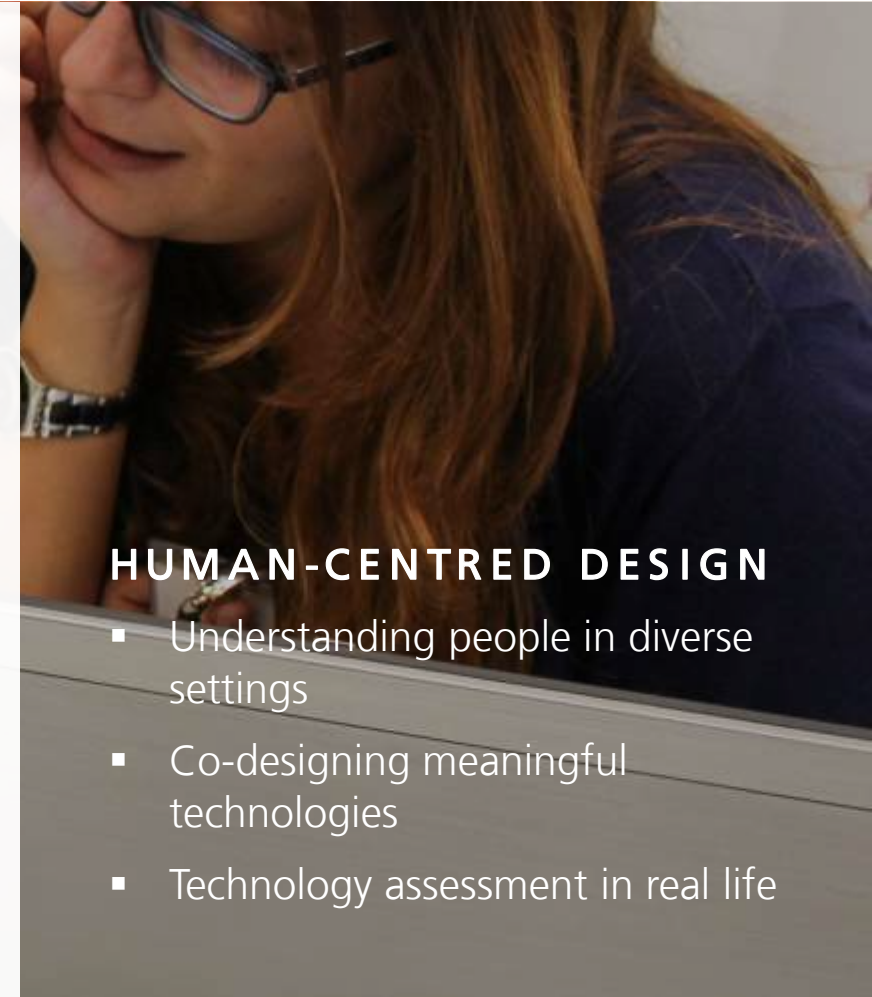
# Fraunhofer AICOS

## Purpose and Scientific Areas



### ASSISTIVE INFORMATION AND COMMUNICATION SOLUTIONS

Understanding and supporting people in the fulfilment of their needs and aspirations



### HUMAN-CENTRED DESIGN

- Understanding people in diverse settings
- Co-designing meaningful technologies
- Technology assessment in real life

# Fraunhofer AICOS

Purpose and Scientific Areas



## ASSISTIVE INFORMATION AND COMMUNICATION SOLUTIONS

Relying on data and treating it intelligently to unveil hidden patterns and support decisions

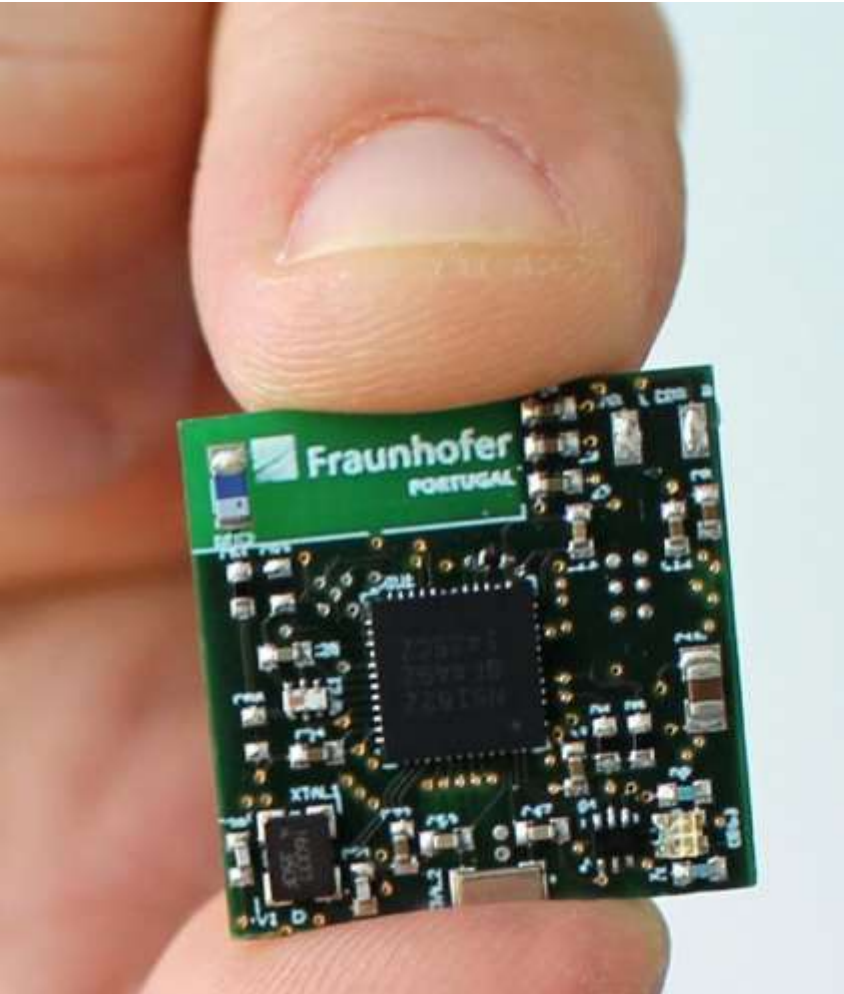


## INTELLIGENT SYSTEMS

- Edge and Cloud Computer Vision
- Sensor Fusion & Embedded Intelligence
- Cognitive Systems & Deep Learning
- Predictive Modelling & Recommendation

# Fraunhofer AICOS

Purpose and Scientific Areas



## ASSISTIVE INFORMATION AND COMMUNICATION SOLUTIONS

Enabling communication and supporting distributed systems through connected devices

## CONNECTED THINGS

- Embedded Electronics
- Communication and Networks
- Edge and Cloud Computing
- Quality Assurance & Regulatory Pre-Compliance

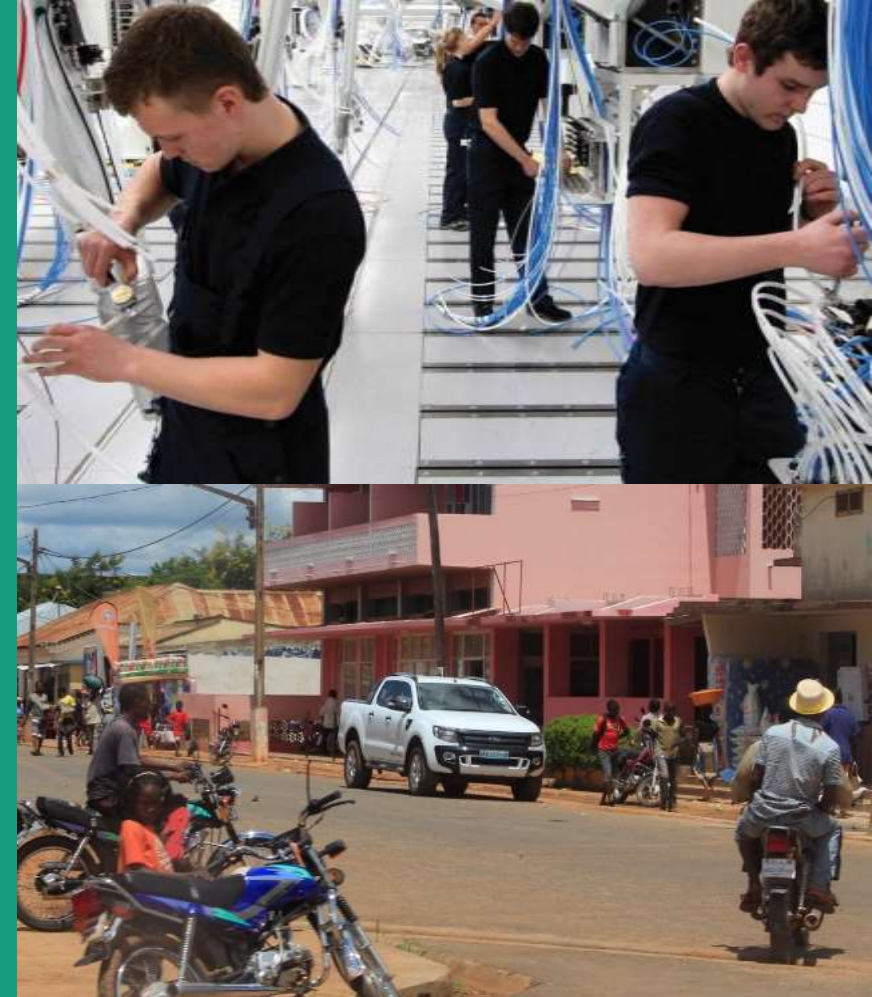
# Fraunhofer AICOS



## ASSISTIVE INFORMATION AND COMMUNICATION SOLUTIONS

Applied research designed to  
bring value to businesses and  
society, connecting:

**PEOPLE | INTELLIGENCE | THINGS**



### COGNITIVE CONNECTED SOLUTIONS

- Letting everything sense
- Prediction and recommendation
- Natural user experience



# Fraunhofer AICOS

## Innovation Areas



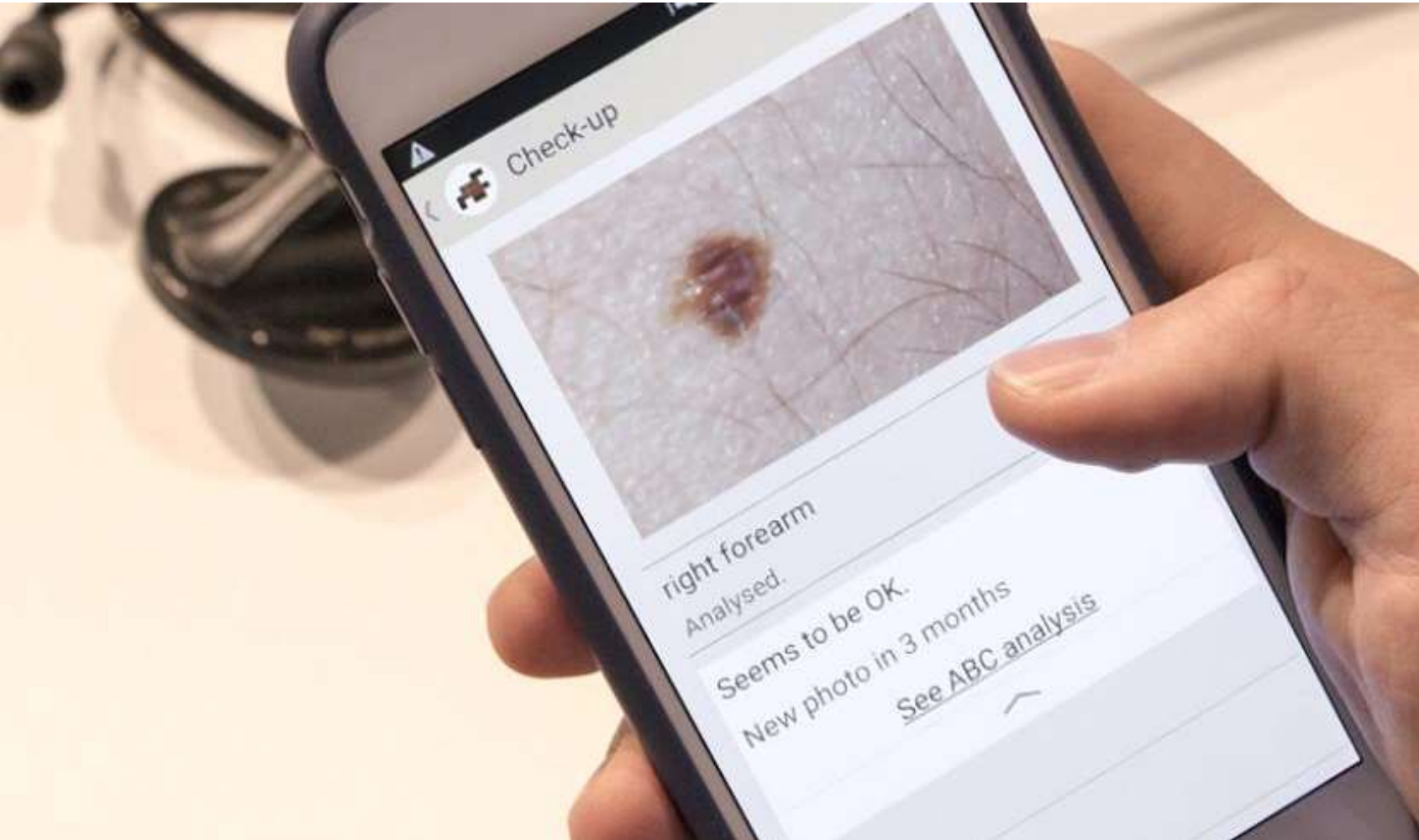
## DIGITAL FARMING

- Decision support
- Mobile crowdsensing
- Efficient and self-managed networks



# Fraunhofer AICOS

## Innovation Areas



## ACCOUNTABLE ARTIFICIAL INTELLIGENCE

- Explainability, transparency and bias
- Accountability and governance
- Fairness and inclusion through technology



# Fraunhofer AICOS

## Innovation Areas



## DECENTRALISED HEALTH TECHNOLOGY

- Prevention
- Support to early intervention and diagnosis
- Self and informal care



# Fraunhofer AICOS

## Innovation Areas



## LIVING AND AGEING WITH DATA

- Personalised technology
- Socio-technical systems
- Technology design by non-technologists



# Fraunhofer AICOS

Portfolio



**SENSE**



**CONNECT**



**COMMUNITY**



**MOTION**



**NUTRITION**



**PERSONAL**



**DERMA**



**OPHTHA**



**MICRON**



**AUDIT**

# Fraunhofer AICOS

Customers & Industries



Healthcare



Wine &  
Agrofood



Electronics &  
Communication



Energy



Retail



eGovernment



Automotive



“

...I think you took a big step forward, especially for people of our age. I recommend it... and I've talked about it to many people!

António Vieira

Over **1,000** participants  
**66** projects supported  
**76** partner institutions  
Over **2,800** research activities

Interviews, observations, focus groups, usability tests, ideation workshops, professional validation, human activity data collection, technology assessment...



“

I love going there. I'm always waiting to see when I'll be invited again!

Maria Carmen Carvalho

# Fraunhofer AICOS

What can we do for you?

We support our partners in the early phases of innovation and technology strategy identification, and in the design and development of innovative solutions.

We offer technical knowledge at the highest levels of science and technology and wide-ranging expertise in the areas of Intelligence, Connectivity and Human-Centred Design.

## Rapid Prototyping

- 3D Printing
- Applications
- Electronics
- Machine Learning
- Networks

## Innovation Studies

- Custom-designed Studies
- State of Art
- Technology Assessment
- User Research

## Education & Training

- Technical and Scientific Workshops
- Professional Training

# Fraunhofer AICOS

What can we do for you?

## **R&D Consulting**

We propose new solutions and ideas for evolving products and services;

## **Proofs of Concept**

Initial implementation for proving that new ideas really work;

## **Prototype Implementation**

Architectural specification; System implementation; System testing and validation;

## **Easy access to German Fraunhofer Institutes in other areas of competence;**

8 Research Groups; More than 80 Research Units; 72 Institutes;

## **Member of National Scientific and Technology System**

Eligible to participate in public incentive R&D programmes.



# Fraunhofer AICOS

## Key Figures

93

Industry Partners

88

Researchers  
and Students

31

Achievements  
**Awards**  
(e.g. CES / Microsoft / Vodafone)  
**Honourable Mentions**

240

Publications

+1,600

Research Participants

+178

Theses



# Fraunhofer AICOS

Fraunhofer Portugal Challenge | 11<sup>th</sup> Edition

## PROMOTE 'RESEARCH OF PRACTICAL UTILITY'

Among Portuguese university students and researchers

## IDEA CONTEST FOR MSc AND PHD THESES

Already in its 11<sup>th</sup> edition, the Challenge is based on MSc and PhD theses from Portuguese Universities



**10<sup>th</sup> 11<sup>th</sup> EDITION**  
**IDEA CONTEST YEARS**  
AWARDING INNOVATIVE SCIENTIFIC IDEAS  
[\[www.challenge.fraunhofer.pt\]](http://www.challenge.fraunhofer.pt)

BASED ON MSc AND PhD THESES  
AI, CYBER-PHYSICAL SYSTEMS, HCI & RELATED SCIENCES

SUBMIT YOUR IDEA! **APPLY UNTIL JULY 31<sup>ST</sup> 2020.**  
An initiative promoted by: Fraunhofer Center for Assistive Information and Communication Solutions – AICOS

## SCIENTIFIC PRIZES FOR THE FOR THE BEST IDEAS

Winning participants are awarded monetary prizes and get media coverage of their work

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**1649-003 Lisbon | Portugal**

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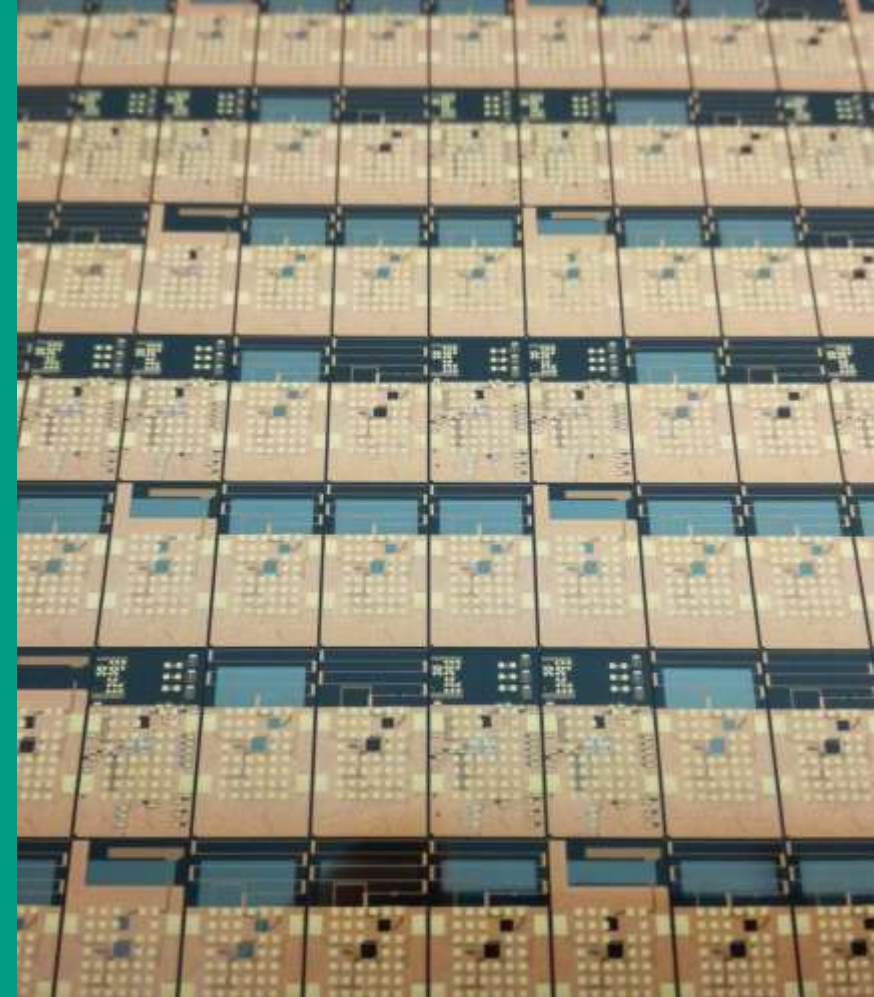
# Fraunhofer AICOS

Small, flexible, and modular cyber-physical systems



## SENSE

Letting everything sense:  
a small, easy deployable and  
modular technology enabling  
virtually any object to sense,  
act and process data



# Fraunhofer AICOS

Network infrastructures for the unconnected



## CONNECT

Connect unconnected communities and things using low-cost network equipment and opportunistic communications



# Fraunhofer AICOS

Crowd assisted services

## COMMUNITY

Developing inclusive tools focused on citizen empowerment, participatory monitoring, urban service delivery, and social equity



# Fraunhofer AICOS

## Understanding Human Movement



## MOTION

Advanced inertial sensors data processing for recognizing human activities and characterizing movements



# Fraunhofer AICOS

Recommendation tools in nutrition

## NUTRITION

Meal recommendations and shopping assistance balancing food preferences, nutrition and budget by combining information



# Fraunhofer AICOS

Personalised technology for self-management of chronic disease and ageing



## PERSONAL

Mobile devices connecting your customers to your services, backed by the science of how humans interact with technology





# Fraunhofer AICOS

Decentralised screening in dermatology



## DERMA

Mobile technology for healthcare professionals, validated as monitoring or referral solution for skin lesions

# Fraunhofer AICOS

Decentralised screening in ophthalmology



## OPHTHA

A smartphone-based handheld optical device that captures retinal images automatically, with intelligent guidance during acquisition. A Computer-Aided Diagnosis of eye diseases is available on-device, as part of the fundus camera

# Fraunhofer AICOS

Affordable and automated mobile-based microscopy



## MICRON

A affordable and automated alternative to conventional microscopes, tailored to effectively support microscopy-based diagnosis in areas with limited access to healthcare services



# Fraunhofer AICOS

Automatic Visual Inspection and Validation



## AUDIT

Computer Vision technology designed for high-level understanding of images or video frames, for quick, automated and recurrent auditing tasks, powered by Artificial Intelligence and Business Logic

