



Fraunhofer
PORTUGAL

CHALLENGE 2023
ON THE ROAD

14TH EDITION

INNOVATIVE
TECHNOLOGIES
IDEA CONTEST
FOR MSC STUDENTS

We CHALLENGE You

Think Technology.
Design the Future.



Fraunhofer Portugal

Fraunhofer – Gesellschaft

Fraunhofer Strategic Research Fields



Bioeconomy



Quantum Technologies



Digital Healthcare



Resource Efficiency and
Climate Technologies



Artificial Intelligence (AI)



Hydrogen Technologies



Next Generation Computing

76
Institutes

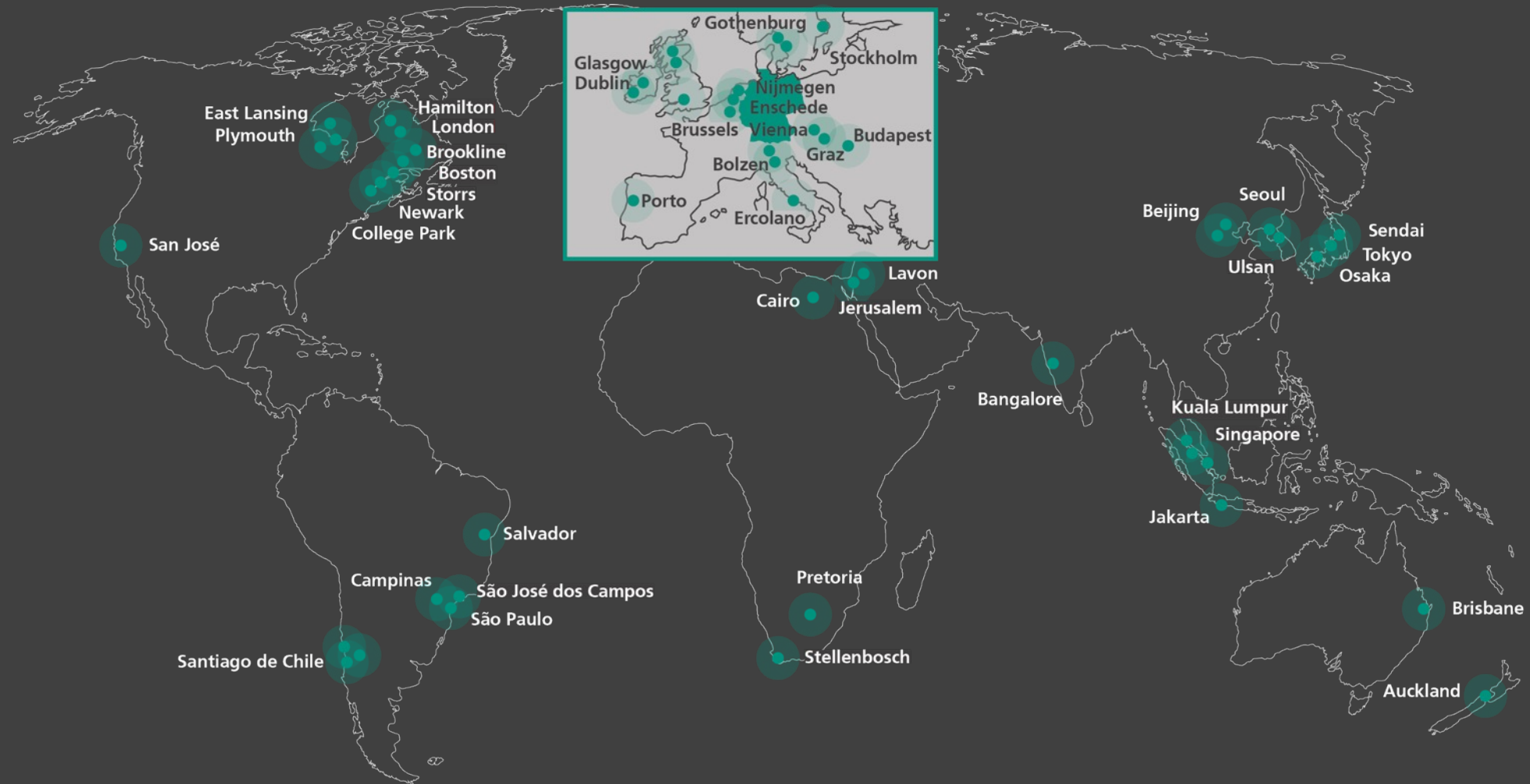
> 80
Research Units

> 30,800
Employees

> € 3.0 billion
R&D Budget
(€ 2.6 billion contract research)

Fraunhofer Portugal

Fraunhofer – Gesellschaft



Fraunhofer Portugal

Institutional Background

ASSOCIAÇÃO FRAUNHOFER PORTUGAL RESEARCH



**FOUNDING
ASSOCIATES**



2008 | Non-Profit
Research Institution of
Public Common Interest

**RESEARCH
CENTRES**

AICOS

AWAM

...

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 Portugal

Associação Fraunhofer Portugal Research

AICOS
14 YEARS



> **2** (Porto and Lisboa)
Research Units

> **106**
Employees



AWAM
4 YEARS



> **2** (Vila Real and Évora)
Research Units

> **13**
Employees

Fraunhofer Portugal

Key Figures

+200

Industry Partners

113

Researchers &
Students

43

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

447

Publications

+1,000

Research Participants

+200

Theses

FRAUNHOFER PORTUGAL AICOS

Fraunhofer Center for Assistive Information and Communication Solutions

Fraunhofer Portugal AICOS

Vision and Mission



PROPOSING FUTURES. IMPACTING LIVES.


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

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.

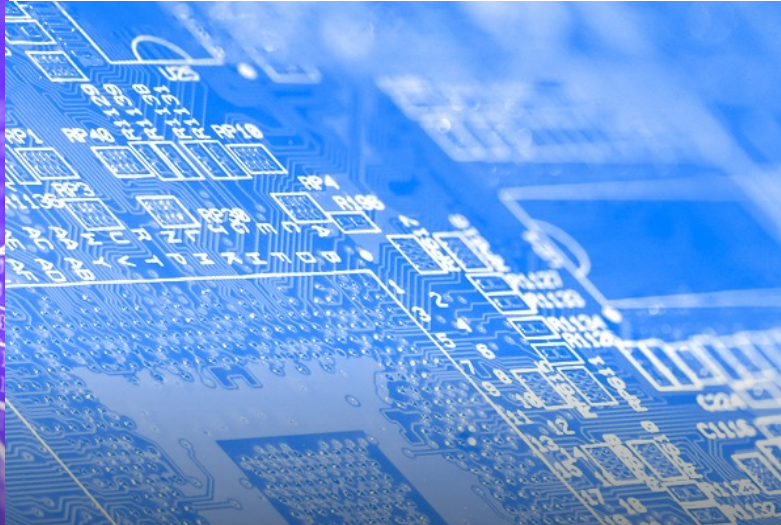
Fraunhofer Portugal AICOS

Purpose and Scientific Areas



INTELLIGENT SYSTEMS

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



CONNECTED THINGS

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



HUMAN-CENTRED DESIGN

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

Fraunhofer Portugal AICOS

Innovation Themes



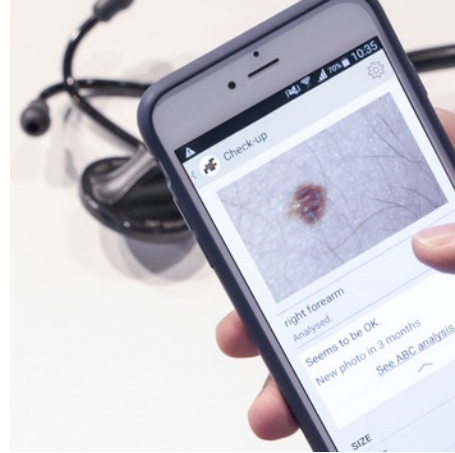
COGNITIVE CONNECTED SOLUTIONS

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



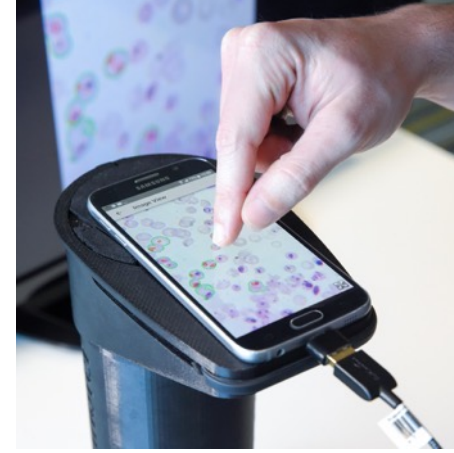
DIGITAL FARMING

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



ACCOUNTABLE ARTIFICIAL INTELLIGENCE

- Explicability, transparency, and bias
- Accountability and ethics
- Fairness and inclusion through technology



DECENTRALISED HEALTH TECHNOLOGY

- Prevention
- Support to early diagnosis and intervention
- Affordable cutting-edge technology



LIVING AND AGEING WITH DATA

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

FRAUNHOFER PORTUGAL AWAM

Fraunhofer Center for Smart Agriculture and
Water Management

Fraunhofer Portugal AWAM

Vision and Mission



CUSTOMER FOCUS to provide solutions for a sustainable **CIRCULAR ECONOMY** in the fields of water, energy, and nutrients.

Recognized **SCIENTIFIC INSTITUTION** in the area of process and environmental technologies and a strong **DEVELOPMENT PARTNER** for Portuguese and European companies.

Fraunhofer Portugal AWAM

Purpose and Scientific Areas



SUSTAINABLE CROP PRODUCTION

- Transportable and storable fertilizers
- High quality products with defined properties
- Agriculturally usable irrigation and fertirrigation



WATER TREATMENT

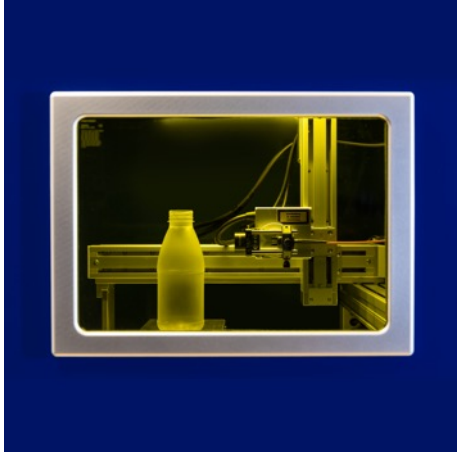
- Inorganic membranes
- Electrochemical treatment methods
- Efficient advanced oxidation processes
- Process-integrated water quality monitoring



BIOMASS ENERGY

- Biogas treatment
- Bio methane production
- CO₂ separation
- Energy storage
- Electrification, automation

Fraunhofer Portugal AWAM Technologies



DOSIMETRY

- Radiation-sensitive ceramic phosphors as dosimeter material for E-beam
- 3D dosimetry on any surface geometry possible



ETHANOL TREATMENT

- Membranes and membrane processes for (bio)ethanol production, membrane distillation, dewatering, and similar processes



GAS SEPARATION

- Gas separation by ceramic membranes, e.g. at elevated temperatures
- Biogas upgrading, membrane reactors, pervaporation applications



LIQUID FILTRATION

- Nano- and ultrafiltration, e.g. for water treatment, nutrient and raw material recovery, dairy products, ...
- Standard filtration applications e.g. for biodigestion, ...



TRACE SUBSTANCES MONITORING

- Optical biosensor design, adaptation and process integration
- Real-time detection of pollutants in low concentration ranges in water or liquid products

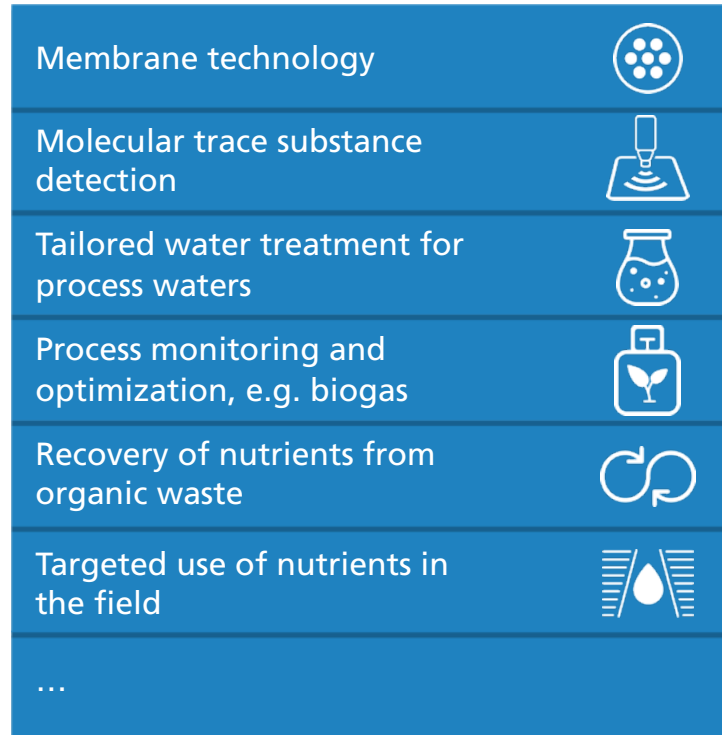


How do the research centres come
together to answer your needs?

AWAM – AICOS Ecosystem

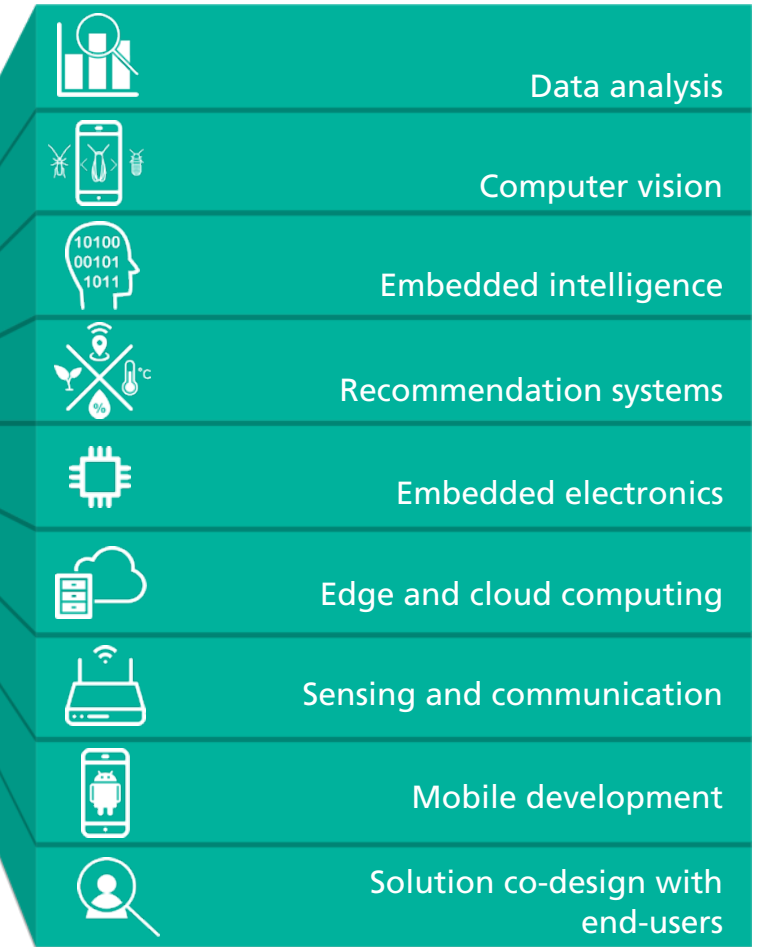
How do the research centres come together to answer to your needs?

AWAM



TO DELIVER:
**SMART AGRICULTURE
WATER MANAGEMENT**

AICOS



Fraunhofer Portugal seeks to encourage cooperation between industry and the scientific community, motivating and rewarding research of practical utility.



Fraunhofer Portugal Challenge

Idea Contest

PROMOTE 'RESEARCH OF PRATICAL UTILITY'

Among Portuguese University Students and Researchers

IDEA CONTEST FOR MSc STUDENTS

On its 14th edition, the Challenge awards MSc students through two categories: the Master Thesis Award (based on the master thesis) and the Student Award (promising idea aligned with FhP-AICOS' scientific areas).



NEW CATEGORY: STUDENT AWARD

In addition to the already existing MSc Thesis Award, the Student Award acknowledges the student with the most promising idea with a money prize and mentoring from FhP-AICOS' research team.

SCIENTIFIC AREAS

- Human-Centred Design
- Artificial Intelligence
- Cyber-physical Systems

Fraunhofer Portugal Challenge

Deadlines for 2023 – Master Thesis Award

1st Phase

- **Idea submittal period:** June 15th to July 31st
- **Announcement of the 1st round results:** September 13th

2nd Phase

- **Additional documentation submittal period:** September 12th to September 22nd
- **Announcement of the 2nd round results:** October 13th

3rd Phase

- **Fraunhofer Portugal Challenge Closing Event:** November 22nd
(public presentation of finalist ideas and definition of 1st, 2nd and 3rd places in Master Thesis Award)

Fraunhofer Portugal Challenge

Deadlines for 2023 – Student Award

- **Idea submittal period:** June 15th to July 31st
- **Announcement of the results and winning idea:** Until September 1st
- **Beginning of the mentoring work:** September 1st to September 25th
- **Announcement of the 2nd round results:** October 13th
- **Fraunhofer Portugal Challenge Closing Event:** November 22nd
(public presentation of the winning idea and overview of the mentoring work and experience)

Fraunhofer Portugal Challenge

2022 Edition

Winning ideas in the PhD and MSc categories

PhD Category

- **2nd** : Bioremediation of agro-industrial effluents mediated by microalgae;
- **2nd** : Finding Inspiration in Nature Towards Sustainable Development;
- **3rd** : Optically thick but electrically thin solar cells: For portable and flexible electronic applications

**no first place awarded*

MSc Category

- **1st** : Fluorescence-based biosensor for detection and quantification of *Colletotrichum acutatum* in infected olives;
- **2nd** : A Cluster-Based Trip Prediction Graph Neural Network for Bike Sharing Systems;
- **3rd** : Leveraging vegetables production with Robotics, Artificial Intelligence and Computer Vision.

Fraunhofer Portugal Challenge

2022 Edition

Closing Event



Fraunhofer Portugal Challenge

2022 Edition

Impressive media coverage both for winning Students and Universities

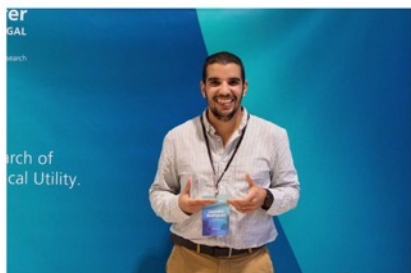
Giovanna Calvão é finalista no Fraunhofer Portugal Challenge



Giovanna Calvão, estudante de mestrado da Universidade de Trás-os-Montes e Alto Douro (UTAD), é finalista no Fraunhofer Portugal Challenge. Este ano, o concurso de ideias dirigido a estudantes e investigadores de todas as universidades portuguesas tem como tema "Think Technology. Design the Future". A dissertação de mestrado realizada pela estudante, sob a orientação da Professora Paula Martins-Lopes e da investigadora da Requerente Doutora Helena Gonçalves, está entre as três melhores na área da Tecnologia Aplicada em todo o país. A final do evento vai ter lugar na Universidade de Aveiro, no dia 26 de outubro.

Fraunhofer Portugal Challenge 2022 distingue alumnus da FCUP

Leandro Rodrigues no pódio na categoria de Mestrado



ACTUALIDADE

O Fraunhofer Portugal Challenge tem nove mil euros para as teses académicas mais inovadoras

O Fraunhofer Portugal Challenge vai premiar seis ideias baseadas em teses de mestrado e doutoramento por estudantes e investigadores de universidades portuguesas. Candidaturas abertas até 31 de Julho.

Fernando Costa
22 de Julho de 2022, 8:45

Relevar alerta

Fraunhofer Portugal Challenge procura ideias de base tecnológica em Portugal

Bit Magazine, 12 de Julho de 2022, 15:17



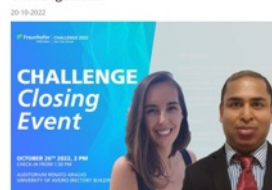
As candidaturas decorrem até dia 31 de julho e serão premiadas seis ideias com um prémio global de 9 mil euros.

UA recebe 13.ª edição do Fraunhofer Portugal Challenge



A Universidade de Aveiro (UA) é anfitriã da 13.ª edição do Fraunhofer Portugal Challenge, que decorre pela primeira vez numa universidade e pretende premiar a investigação científica. O evento decorre hoje e será assinalado com uma mesa redonda subordinada ao tema "O papel da tecnologia para a sustentabilidade". A sessão, que traz a debate uma das temáticas mais relevantes da atualidade, terá lugar às 9:45 horas, na Sala dos Atos Académicos da UA.

Finalists of the Fraunhofer Portugal Challenge 2022

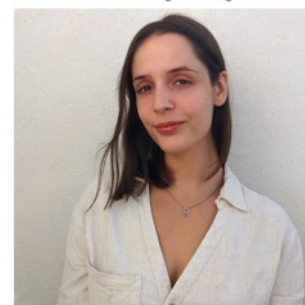


In the 2022 edition of the Fraunhofer Portugal Challenge, under the theme "Think Technology. Design the Future", six finalists have been selected and will present their ideas at the closing event, which will occur on the 26th of October at the Auditorium Renato Araújo (University of Aveiro) at 14h00. The finalists are: Inês Cunha and Soraia Haque are among the list of finalists in the PhD category, participating with bright (technology based) ideas inspired in the works developed during their PhD activities in CENIMAT (UM and CEMOP).

Inês Cunha: "Finding inspiration in Nature Towards Sustainable Development" PhD thesis: "Printed and Green Flexible Electronics based on Cellulose Nanocomposites" Supervision: Prof. Luís Pereira (NOVA University Lisbon) Co-supervision: Prof. Rodrigo Martins (NOVA University Lisbon)

Soraia Haque: "Optically Thick but Electrically Thin Solar Cells for Portable and Flexible Electronic Applications"

Giovanna Calvão, estudante de mestrado da UTAD, é finalista no Fraunhofer Portugal Challenge



Conferências

Fraunhofer Portugal Challenge 2022 premia as melhores ideias de base tecnológica

18 outubro 2022

f t in

Os prémios da 13ª edição do Fraunhofer Portugal Challenge, com o tema "Think Technology. Design the Future", vão ser entregues dia 26 de outubro, às 14h00, no Auditório Renato Araújo, na Universidade de Aveiro (UA).

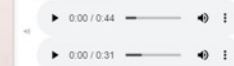


UA recebeu evento final do Fraunhofer Portugal Challenge.

2022-10-27 09:15

Temas: evento UA Fraunhofer Portugal
Categoria: Sociedade
Conceito: Aveiro

Áudio da Notícia:



Fraunhofer Portugal Challenge

Testimonials

“

This award is perfectly aligned with my competitive spirit and meets the recognition of the effort of several years of work. This event is undeniably the ideal trigger to ensure development with ultimate innovation! ”

Inês Cunha

2nd place winner in the PhD category for her idea
"Finding Inspiration in Nature Towards Sustainable Development"



Fraunhofer Portugal Challenge

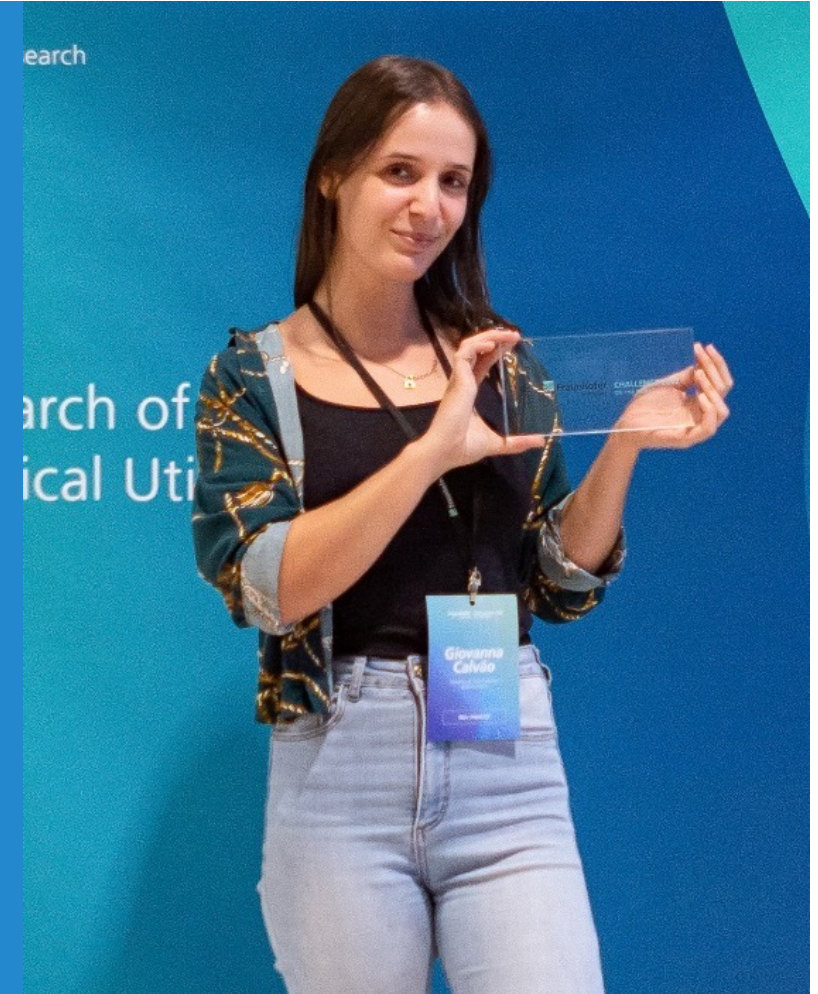
Testimonials

“

Winning this award was an honor. It is very gratifying to see our work being recognized by a highly relevant institute such as Fraunhofer Portugal, valuing the partnership of two teaching and research institutions, UTAD (DNA & RNA Sensing Lab) and REQUIMTE. On a personal level, it is an important incentive to continue to trace my path in the same area, contributing to a more sustainable future.”

Giovanna Galvão

1st place winner in the MSc category for her idea
"Fluorescence-based biosensor for detection and quantification of *Colletotrichum acutatum* in infected olives"



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