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Pereira

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Research Infrastructure

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Completo

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Aguiar Pereira Marques

SUBDIRECTOR – Communication

Fernando José Neto da
Silva

138 members (effective, associated and collaborative)

51 projects (FCT, National, European and International)

197 research publications

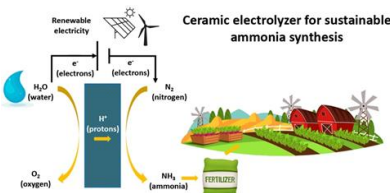
9 patents (European and national)

159 Master dissertations

45 PhD running thesis

Mechanical testing laboratory - ISO9001 Certified

Member founding of LASI - Intelligent Systems



Sustainable Plastics Advanced Solutions



Co-funded by
the European Union



Co-funded by
the European Union

SPOTLOG

EMBRACER



Editorial Note

With the release of the 5th Newsletter, the board of the research unit Centre for Mechanical Technology and Automation (TEMA), underscores its commitment to fostering robust communication channels among its members and the wider community. At the core of TEMA's mission lies a dedication to advancing a sustainable industry and societal well-being through the cultivation of excellence in engineering, technology, and impactful research and innovation. This mission is made attainable through the collective efforts of TEMA's researchers, coupled with a steadfast commitment to executing strategic mobilizing projects responsibly and effectively.

TEMA's strategic focus aligns closely with contemporary societal challenges and forthcoming global imperatives, manifested through its three principal mobilizing projects: Sustainable Manufacturing Solutions, Technologies for Wellbeing, and Research Infrastructure. These projects serve as the focal points for collaborative endeavours within TEMA, uniting its members towards a common purpose.

In a rapidly evolving landscape where companies are compelled to adapt to dynamic market conditions, TEMA remains cognizant of the pressing issues of our time, extending its research endeavours beyond scientific realms to address broader societal concerns. Furthermore, the dissemination of TEMA's research findings in high-impact journals underscores its commitment to global knowledge exchange and collaboration.

The annual International Conference of TEMA held at the University of Aveiro serves as a testament to the growing prominence of the research conducted within the centre. With a diverse array of participants, including master's students and seasoned investigators, the conference reflects TEMA's pivotal role as a hub for cutting-edge scientific inquiry and innovation.

TEMA's dedication to excellence is exemplified by its pioneering efforts, including the establishment of the first certified laboratory at the University of Aveiro, adhering to the rigorous standards of NP EN ISO 9001:2015. This certification not only bolsters TEMA's credibility but also underscores its commitment to delivering exceptional service to its stakeholders.

Moreover, TEMA's pivotal role as a founding member of the Intelligent Systems Associate Laboratory (LASI) further solidifies its position as a leader in the scientific community. Through LASI, TEMA endeavours to promote the generation, dissemination, and utilization of knowledge pertinent to present and future scientific and technological challenges.

In essence, TEMA's core values of change, diversity, citizenship, and societal impact underscore its commitment to multidisciplinary research aimed at fostering innovation, enhancing manufacturing processes, and promoting societal wellbeing.

TEMA keywords: change, diversity, citizenship, mobilizer, society, impact, multidisciplinary research, manufacturing, wellbeing

Research Infrastructure Strategic Plan 2020 - 2024



ID: UIDB/00481/2020, UIDP/00481/2020

Funding Entity: FCT – Fundação para a Ciência e a Tecnologia

Principal Investigator: António Pereira

TEMA Team: All members

Consortium: TEMA-UA

Total / TEMA Budget: 1,100,000.00 €

Duration: From 2020 to 2024

Summary: TEMA is focused on current societal challenges and upcoming global requirements, translated into three main **mobilizing projects** (MP): Mobilizing Project 1 – Sustainable Manufacturing Solutions; Mobilizing Project 2 - Technologies for the Wellbeing; and Mobilizing Project 3 - Research Infrastructure, involving TEMA's members as one coherent group. MP1 is focused on the development and innovation on **manufacturing** engineering and technologies, with subsequent industrial applications. It is intended to increase productivity, improve products 'quality and reduce waste in production processes. The strategy of the MP2 aims to increase the quality of life of **society** by means of engineering systems, focusing on people and their needs. MP3 aims at a rational and efficient management of TEMA's material and human resources (including its 14 laboratories), its vast array of scientific equipment in a large **diversity** of areas available to **society**, making the research infrastructure an "open facility" for a number of (academic, research and industry) end-users. TEMA has also a funding for 5 PhD thesis, giving the support to researchers on achieving the third academic degree.

Research Infrastructure – Centre for Mechanical Technology and Automation TEMA

Funding Entity: CENTRO 2020; **ID:** CENTRO-01-0145-FEDER-022083

Principal Investigator: António Pereira; **TEMA Team:** All members; **Consortium:** TEMA-UA

Total / TEMA Budget: 1,202,880.91 €; **Duration:** From 2017 to 2024

Summary: TEMA's research infrastructure has its origin in the research unit with the same name, created in 1996. It supports a multidimensional structure embracing three strategic specialization vectors focused on research, innovation, technological development, technology transfer and consulting, training and services. TEMA is included in the "Portuguese Roadmap of Research Infrastructures of Strategic Relevance", in alignment with the European Strategic Forum on Research Infrastructures (ESFRI), having been classified by FCT – Fundação para a Ciência e a Tecnologia with the highest rating ("Category 1 - those that have demonstrated high scientific potential and are considered to have high strategic regional and/or national relevance").



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation

Develop research and innovation on key enabling technologies, namely Advanced Manufacturing Technologies, including innovative forms of transforming raw materials or components into new products, either applying conventional manufacturing processes or making use of the most recent and cutting-edge science breakthroughs.

This will be accomplished by the promotion of developments on the use of physical and virtual manufacturing tools within product design and manufacturing cycles. This engagement can strategically have impact in a number of processes, namely:

- Digital manufacturing;
- Additive manufacturing (3D printing of metals and polymers/composites);
- Novel 3D printing processes and equipment development
- Joining techniques (FSW, LASER, etc.) for a sustainable and reliable adoption of multi-material structures;
- Multifunctional and cellular materials manufacturing;
- Advanced injection molding processes and tools for fast manufacture;
- Increase the innovation level of SME's traditional manufacturing processes;
- Automation and robotic systems applied to production processes.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



PRR
Plano de Recuperação
e Resiliência

AM2R - Mobilizing Agenda for business innovation in the two-wheel sector

WP3 - Development of an intelligent electric scooter - Maria Bike / AM2R1

PI: António Bastos and José Paulo Santos

TEMA Budget: 987,905.00 €

WP6 - RODI - Implementation of production capacity for high-end bicycle rims (Mountain Bike and E-BIKE) and hub production / AM2R2

PI: António Bastos

TEMA Budget: 801,455.00 €

Consortium leader: POLISPORT PLASTICOS, S.A.

Duration: From October 2021 To December 2025

Website: <https://www.am2r.pt/>

Objective: The Mobilizing Agenda for business innovation in the Two-Wheeled Sector aims to operationalize the intervention in priority areas in the value chain that will allow the transformation of the national production profile and the development of a new specialization profile in the sector to leverage its competitive position in the international market, focusing on independence from the Asian market, through the development and endogenization of advanced knowledge on new products, processes and services, increasing and differentiating national productivity and enhancing the dissemination of technological knowledge based on sustainability and digitalization.

Thus, the main objective of the Agenda is to consolidate and expand the connection between the business fabric and the scientific and technological system in order to increase the competitiveness and resilience of the sector based on research and technological development, innovation and diversification of the productive structure of products and services.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



ATE - Alliance for the Energy Transition

WP2.01 - Scalable and customised mobile substations that can be integrated into independent units, connected to vehicles or containers, and considering connectivity solutions / ATE1

PI: Sérgio Tavares and António Bastos

TEMA Budget: 1,299,029.00 €

WP2.02 - Development of a new generation of Shell-type power transformers / ATE2

PI: Sérgio Tavares and António Bastos

TEMA Budget: 1,199,326.00 €

WP2.03 - Development of innovative distribution transformers for renewable energy generation / ATE3

PI: Sérgio Tavares and António Bastos

TEMA Budget: 1,148,359.00 €

Consortium leader: EFACEC ENERGIA - MÁQUINAS E EQUIPAMENTOS ELÉTRICOS, S.A.

Duration: From October 2021 To December 2025

Website: <https://www.ua.pt/en/agendaspr/ate>

Objective: The Alliance for Energy Transition aims to strengthen the competitiveness and resilience of companies in the energy sector as a result of the creation of innovative products and solutions of an export nature, based on technology and know-how developed and consolidated in the sector, placing Portugal at the forefront of decarbonisation and enabling an effective energy transition. The ATE will contribute significantly and sustainably to national strategic objectives, such as increasing exports (443 M€), increasing investment in R&D (209.5 M€), reducing emissions (3.4MtonCO₂), as well as changing the specialisation profile of the economy (552 M€ sales).

The ATE involves 55 companies and 27 ENESIs, creating a truly structured ecosystem for the Energy Transition. In addition to the planned PPS, the ATE will also create more than 400 skilled jobs out of a total of 706, supported by a total investment of 342 M€ over the next four years.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



ILLIANCE

WP1 - Heat pumps / ILLIANCE1

PI: António Bastos

TEMA Budget: 2,817,275.00 €

WP2 - Cork composites for lining hydrogen tanks and sealing distribution networks / ILLIANCE12

PI: Ricardo Sousa

TEMA Budget: 281,618.00 €

WP2 - H2 combustion equipment / ILLIANCE2

PI: António Completo

TEMA Budget: 1,719,424.00 €

Consortium leader: BOSCH TERMOTECNOLOGIA, S.A.

Duration: From October 2021 To December 2025

Website: <https://www.illiance.pt/>

Objective: The ILLIANCE Agenda addresses carbon neutrality associated with the buildings sector, through the design, development, and industrialization of complementary technologies, associated with 3 fundamental pillars, namely: health, comfort, and sustainability.

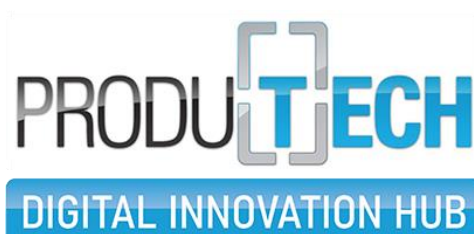
These innovative technologies are integrated into a series of projects, which materialize the following integrated vision: - “Intelligent, efficient, comfortable, and sustainable buildings”.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



PRODUTECH DIH - PRODUTECH Digital Innovation Hub

Principal Investigator: Victor Neto

TEMA Team: José Paulo Santos

Total / TEMA Budget: 5,999,966.15 € / 316,509.21 €

Duration: From October 2022 To March 2026

+info: <https://dih.produtech.org/>

Consortium: PRODUTECH; CCG; Fraunhofer; CATIM; CENFIM; CENTI; CTCOR; INEGI; INESC TEC; INL; ISEP; ISQ; ISR; IST/IDMEC; PEIP; UNINOVA; UA; UM; UPTEC

Funding entity: European Union & República Portuguesa; **ID:** 101083487

Summary: The mission of PRODUTECH DIH is to promote the digitalization of the manufacturing industry, through an intervention directed to production technologies and leveraging the role they assume in the digital transformation of the industry.

SMALER - Sustainable manufacturing of light vehicles considering resources and recycling

Principal Investigator: Gabriela Vincze

TEMA Team: António Bastos, Marilena Butuc, Pedro Prates, Catarina Pereira, João Pereira

Funding Entity: National Funds (OE) by FCT—Fundação para a Ciência e a Tecnologia, I.P.

Total / TEMA Budget: 249,817.87 €; **Duration:** From 2023 to 2025

Summary: Lightweighting is a priority in the transportation sector. To achieve lighter and safer structural components for vehicles, advanced materials are continuously developed to improve their strength, work-hardening, formability, and energy absorption. An alternative to the development of new alloys is the use of innovative forming processes to respond to such requirements. The objective of this project is to contribute to a sustainable fabrication of vehicles, with a real impact on the environment, through the improvement of the manufacturing of lightweight components.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



VForm-xSteels

vForm-xSteel - Toward virtual forming and design:
Thermomechanical characterization of advanced high strength steels through full-field measurements and a single designed test

Principal Investigator: A. Gil Andrade-Campos

Total Budget: 2,521,389.20 €; **TEMA Budget:** 308,734.77 €

Duration: From 2020 To 2024

Funding entity: European Union - Research Fund for Coal and Steel; **ID:** 888153

TEMA Team: João Dias Oliveira, Robertt Valente, Victor Neto, Bárbara Gabriel and Isabel Duarte. Also João Martins, Miguel Oliveira, Mariana Conde, Mafalda Gonçalves, Rúben Lourenço, Lucius Filho and Débora Rodrigues.

Consortium: Universities of Aveiro (Portugal), Bretagne Sud (France), KU Leuven (Belgium) and Politecnica delle Marche (Italy) and the companies MatchID and OCAS (Belgium) and DAF Trucks (The Netherlands).

Summary: The main goal of the project VForm-XSteels is to develop an efficient and accurate methodology for material characterization and determining the material parameters of thermomechanical models, from a dedicated single test that involves nonhomogeneous temperature and strain fields. Indeed, this non-homogeneity leads to richer information than more traditional approaches with quasi-homogeneous tests, thus leading to a decrease of the number of experiments. A database and online library with calibrated material constitutive models, particularly for AHSS, is also developed.



I-Retis Water - Integrated operation of smart water networks in real time

Principal Investigator: A. Gil Andrade-Campos

Total / TEMA Budget: 484,811.48€ / 156,458.23 €

Duration: From 2021 To 2023

Funding entity: FEDER; **ID:** centro-01-0247-FEDER-069857

TEMA Team: José Paulo Santos, Marlene Brás, Ana Reis, Ana Sousa, Sara Mota, Tiago Pereira, Flávio Silva, Iago Freitas, Guilherme Borges, Júlio Monteiro, Feliciano Sachilombo, João Lima, Jorge Júnior and Débora Rodrigues

Consortium: Scubic (company)

Summary: Implementation of a System capable of autonomously managing all operations of a water supply network at the lowest possible cost, achieving reductions of up to 15%.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



GET-AHED - Green Education and Transition - A Higher Education Digital Buddy

Principal Investigator: Bárbara Coelho Gabriel

TEMA Team: António Gil Andrade-Campos; Robertt Valente;

Consortium: WPZ RESEARCH GMBH (WPZ RESEARCH) (Coordinator); FACHHOCHSCHULE VORARLBERG GMBH (FH VORARLBERG); MUNSTER TECHNOLOGICAL UNIVERSITY (MTU); UNIVERSITY OF RUSE ANGEL KANCHEV (UR); UNIVERSITY OF AVEIRO (UAVEIRO);

Total Budget: 587,728.00 €; **TEMA Budget:** 95,067.00 €

Duration: From 2023 To 2026

Website: <https://www.get-ahed.eu/>

Funding entity: Erasmus+ (European Commission)-
(FEDER/FNR/COMPETE2020/PORTUGAL2020); **ID:** 101087248

Summary: Providing a range of tools to allow a multiple of HE stakeholder groups to promote and develop whole institutional approaches to sustainability.



SFF.DeepT+ - DeepTech in Higher Education Institutions and Ecosystems through Entrepreneurial Education+

Principal Investigator: Bárbara Coelho Gabriel

Total Budget: 749,898.33 € / **TEMA Budget:** 101,578.00 €

Duration: From 2023 To 2024

TEMA Team: António Gil Andrade-Campos; Robertt Valente; Carla Ferreira; José Rabelo Neto

Consortium: UNIVERSITY OF AVEIRO (Coordinator); DUNDALK INSTITUTE OF TECHNOLOGY; EDINBURGH NAPIER UNIVERSITY; FUNDACIO TECNOCAMPUS MATARO-MARESME; JOSIP JURAJ STROSSMAYER, UNIVERSITY OF OSIJEK; MARTIN-LUTHER UNIVERS. HALLE-WITTENBERG; QUEEN'S UNIVERSITY BELFAST; STRASCHEG CENTER FOR ENTREPRENEURSHIP GMBH; UNIVERSITY OF ECONOMICS VARNA

Funding entity: European Institute of Innovation & Technology (European Commission) / (FEDER/FNR/COMPETE2020/PORTUGAL2020); **ID:** KAVA 23611

Summary: SFF.DeepT+ Project sets the pathway to the future, towards 2030 and beyond, with a new Systemic DeepTech Innovation framework that involves (as drivers and key-actors) the relevant stakeholders of an Open European Innovation Ecosystem. The project is grounded in the consolidated Start for Future initiative and community, being the driver of a NEW DEAL OF INNOVATION which bridges and brings together the Knowledge Triangle partners with an effective collaborative capacity, built through the understanding of interconnectedness in achieving synergies of co-creation among partners, and capability to adapt to emerging changes in society.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



TANDEM+ - Transformation, Acceleration, Networking, Development, Entrepreneurial education and Mentoring+

Principal Investigator: Bárbara Gabriel

Funding entity: European Institute of Innovation & Technology (European Commission); **ID:** KAVA 21411

Total Budget: 1,200,000 €; **TEMA Budget:** 169,259.34 €; **Duration:** From 2021 To 2023

TEMA Team: A. Gil Andrade-Campos; Cláudia Figueiredo; Robertt Valente;

Consortium: University of Aveiro (Coordinator); CVUT Prague; Dundalk Institute of Technology; Strasczeg Center for Entrepreneurship; University of Economics Varna; Fundació Tecnocampus Mataró-Maresme; Josip Juraj Strossmayer University Of Osijek; Danish Foundation For Entrepreneurship

Summary: TANDEM+ sets the path towards 2030 with a multi-dimensional, international Open Entrepreneurship Alliance for societal impact under the Sustainable Development Goals. The Alliance will prepare talents for entrepreneurial thinking and actions, promoting an international exchange of talents and start-ups, and creating a network of European universities, EIT Knowledge and Innovation Communities (KICs), and stakeholders of regional ecosystems. The long-lasting impact of the project will be ensured through mentoring, 'train the trainer', and micro-credential programmes for the partners of the network, with a special focus on countries from the EIT Regional Innovation Scheme.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation

EUFORIA - Education Framework for Urban Resilience Innovation Activities

Principal Investigator: Bárbara Gabriel

Funding entity: European Institute of Innovation & Technology (European Commission)

ID: KAVA 21417

Total Budget: 686,500 €; **TEMA Budget:** 106,125 €; **Duration:** From 2021 To 2023

TEMA Team: A. Gil Andrade-Campos; Cláudia Figueiredo; Robertt Valente;

Consortium: Athens University of Economics & Business – Athens Center for Entrepreneurship and Innovation; Strascheg Center for Entrepreneurship; The Edge; J.J. Strossmayer University in Osijek; University of Aveiro

Summary: EUFORIA Project aims to empower entrepreneurial ecosystems by developing and implementing an education framework that ignites the creation of hubs in four cities (Athens, Varna, Osijek, and Aveiro), with a particular focus on the role of universities. The Non-RIS region Munich will contribute as a co-creation partner and deliver good practice approaches. In each city, representatives of the quintuple helix will be actively engaged to define and solve specific challenges related to the mobility needs of people and businesses and create a longstanding impact on cities and urban quality of life, addressing regional missions and societal challenges and following smart specialisation strategies for sustainable and inclusive growth (S4+).



BAFHTA - Biomechanical Analysis of female head trauma

Principal Investigator: Ricardo Sousa

Total / TEMA Budget: 245,145.51 €

Duration: From 1/2022 To 12/2024

Funding entity: FCT; **ID:** PTDC/EME-EME/1239/2021

Consortium: TEMA – UA

TEMA Team: Fábio Fernandes, Joaquim Pinho-da-Cruz, Joana Pinto, Marcos Gomes and Carlos Cardoso

Summary: The biomechanics of traumatic injuries of different parts of the human body, as a consequence of road crashes, falling, contact sports, and military environments have been studied for decades. Despite its great importance, the vast majority of studies in the field do not take into account the sex aspect regarding the morphology and physiology of women, which indeed differs from men and may result in a distinctive outcome for a given traumatic event.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

1. Manufacturing Processes and Simulation



ESRS-HSRC - Efficient and Sustainable Refrigeration Systems Integrating Heat Storage Materials and Radiative Cooling

Principal Investigator: Fernando Neto

TEMA Team: Daniel Lemos Marques; Nelson Martins;

Consortium: University of Aveiro and Aalborg University

Total Budget: 5,000.00 € / **TEMA Budget:** 4,000.00 €

Duration: From October 2022 To October 2023

Funding entity: SMART-ER Project, funded by the European Union's Horizon 2020 R&I programme; **ID:** SPA_1_2_004_2022

Summary: A joint supervision supported the PhD candidate's research on mixing variable electricity cost, renewables' availability, control algorithms, and thermal energy storage to boost performance and ease cooling unit costs. The co-tutelle deal included networking actions and shaping future pacts.

SIGIP - Integrated System for Intelligent Production Management

Principal Investigator: Fernando Neto

Funding Entity: PO Centro 2020; **ID:** CENTRO-01-0247-FEDER-069964

Total / TEMA Budget: 214,000.85 €; **Duration:** From 2021 to 2023

Consortium: Universidade de Aveiro, CTCV – Centro Tecnológico da Cerâmica e do Vidro, Primus Vitória – Azulejos SA, RCSOFT – Desenvolvimento de Software, Lda

Summary: The aim of the SIGIP project is the development of an integrated system of intelligent management of production for the ceramics industry, aggregating and allowing the digitalisation and integration of production information with predictive capacity and decision support, allowing the early detection of irregular events, acting and correcting parameters that aim to optimise production. The proposed developments are based on the development of predictive algorithms for the detection of anomalous situations in the production system. These developments will result in a system configured in a MES (Manufacturing Execution System), with predictive algorithms that will allow the monitoring and correction of parameters, which will provide information for a direct action on the equipment.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

2. Nanoengineering and bio-inspired manufacturing

Take advantage of the immense possibilities opened by nanoengineering and bio-inspired manufacture. Using biomanufacturing (or bio-inspired) technologies, it is intended to develop research along two paths: (i) biomanufacturing processes themselves, i.e., to perform research and innovation on the fabrication processes with biological material; and (ii) apply concepts of bio-inspired engineering to create efficient and optimized products along two areas, for instance:

- Nanofabrication processes;
- Nanomodular materials and systems by design: to characterize and build nanomaterials, devices and systems with a suitable composition of various nanostructures.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

2. Nanoengineering and bio-inspired manufacturing

SUSTAIN - E

SUSTAIN-E - Sustainable Safety for E-Micromobility

Principal Investigator: Fábio Fernandes

Total / TEMA Budget: 49 996,80€

Duration: From 2023 To 2025

ID: 2022.04022.PTDC

Funding entity: National Funds (OE) by FCT—Fundação para a Ciência e a Tecnologia, I.P.;

TEMA Team: Ricardo Sousa; António Pereira; Lídia Oliveira; Telmo Fernandes; Mafalda Melo
Consortium: Universidade de Aveiro

Summary: SUSTAIN-E explores disruptive and sustainable solutions for protective gear in the scope of e-micromobility, investigating the potential of new concepts for protective equipment by developing new eco-friendly Nano-composite structures with enhanced impact performance and functionality.



GRASS-LIGHT - Filament for Sustainable Synthetic Grass, Photoluminescent and Backlit

Principal Investigator: Victor Neto

Funding entity: ANI - Agência Nacional de Inovação, S.A.
/ POCI 2020, **ID:** POCI-01-0247-FEDER-047096

Total Budget: 690,755.14 €; **TEMA Budget:** 199,040.66 €

Duration: May 1st, 2021, to June 30th, 2023

TEMA Team: Mónica Oliveira and Laura Prior

Consortium: Safina – Sociedade Industrial de Alcatifas Lda, Universidade de Aveiro (TEMA & CICECO), and Instituto de Telecomunicações.

Summary: The GRASS-LIGHT project aims to develop a new type of sustainable filament for the production of artificial turf, with the incorporation of polymeric fibers doped with optical centers assets for application in luminescent lawns and optical systems for transport, coupling and light control based on trichromatic LED technology. This solution will be feasible and advantageous both for sporting and for garden and leisure spaces. In addition, the lighting capacity will make it possible to explore technologies in a radically innovative way, making it possible, for example, to model information on lawns.



Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

3. Manufacturing for Circular Economy

Create a sustainable growth by ensuring coherence between industrial, environmental, climate and energy interests. To support this, the transformation of the economy into a circular one is crucial, where the value of products and materials is maintained for as long as possible, bringing major economic and environmental benefits.

The latter is attained by:

- New energy sources and technologies with low environmental impact (exploitation of novel materials for electrical generation, energy storage, etc.);
- Systems engineering for clean and renewable energy manufacturing;
- Develop and apply new engineered recyclable materials;
- Process management optimization, including fabrication and transportation processes.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

3. Manufacturing for Circular Economy

**S4PLAST**

Sustainable Plastics Advanced Solutions

S4PLAST - Sustainable Plastics Advanced Solutions**Principal Investigator:** Victor Neto**Funding entity:** ANI - Agência Nacional de Inovação, S.A. / POCI 2020; **ID:** POCI-01-0247-FEDER-046089**Total Budget:** 4,828,641.44 €; **TEMA Budget:** 329,779.06 €**Duration:** July 1st, 2020, to June 30th, 2023.**TEMA Team:** João Oliveira, Mónica Oliveira, José Santos, Tatiana Zhiltsova, Sofia Rocha

Consortium: Iber-Oleff - Componentes Técnicos em Plástico, S.A.; Centimfe – Centro Tecnológico da Indústria de Moldes, Ferramentas Especiais e Plásticos; Universidade do Minho; Instituto Superior Técnico; Instituto Politécnico de Leiria; Universidade de Coimbra; Universidade de Aveiro; Associação Pool-Net – Portuguese Tooling & Plastics Network; Weadd, Lda; Edilásio Carreira da Silva, Lda; ITJ Internacional Moldes, Lda; OLI – Sistemas Sanitários, S.A.; Erofio Atlântico, S.A.; Cabopol – Polymer Compounds, S.A.; 3DTech – Produção, Optimização E Reengenharia, Lda; Neutroplast – Indústria de Embalagens Plásticas, S.A.

Summary: The project S4Plast intends to develop advanced and sustainable solutions for products with innovative characteristics in plastic supported by operations in the entire value chain of molded plastic, namely by introducing design methodologies for sustainability with integration of materials advanced and functional, design for recyclability and the promotion of circular business models. The project will promote the use of new, more optimized and sustainable manufacturing systems based on clean technologies and agile production systems with advanced monitoring, to create multifunctional products customized to the customer's requirements.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

3. Manufacturing for Circular Economy



EcoBoard - Applying the Concept of Circularity to the R&D of a New Generation of Sustainable Visual Communication Products

Principal Investigator: Victor Neto

Funding entity: ANI - Agência Nacional de Inovação, S.A.
/ POCI 2020; **ID:** POCI-01-0247-FEDER-047741

Total Budget: 859,312.31 €; **TEMA Budget:** 323,722.34 €

Duration: January 1st, 2021, to June 30th, 2023

TEMA Team: João Oliveira, Bárbara Gabriel and Carlos Correia

Consortium: Bi-Silque – Produtos de Comunicação SA, Universidade de Aveiro (TEMA & CICECO)

Summary: The EcoBoard project aims to develop a new generation of sustainable writing boards, with enhanced characteristics and reduced environmental impact. To this end, the consortium intends to investigate and map materials from renewable, recyclable and/or bio-based sources, with lower social and environmental risks, which will allow the development of an innovative surface that mimics the ceramic surface and, above all, allows – at the end of the product's life cycle – to be reintroduced again in the production cycle as raw materials for new boards.



RE-LIVE-BLADES - Development of technology to obtain a by-product resulting from the dismantling of wind generator blades at the end-of-life

Principal Investigator: Carlos Relvas

Total / TEMA Budget: 237,715.87 €

Duration: From 1/2021 To 06/2023

Funding entity: CENTRO 2020; **ID:** CENTRO-01-0247-FEDER-069820

Consortium: TEMA-UA; CUTPLANT SOLUTIONS,S.A., ANYWIND-ENERGIAS RENOVÁVEIS,LDA.

Summary: The Re-Live Blades project aims to research and develop a machine that, in situ, performs the grinding/dismantling of the blades of end-of-life wind turbines in a clean manner, and to characterise the result of this grinding, as well as to study the recovery of this grinding in the form of a product. Within the scope of R&I Specialisation, this project has defined the following priority areas: 1. Waste reduction, management, treatment and valorisation; 2. Development of greener and more efficient production processes; 3. Development of production technologies and product industry.

Mobilizing Projects

MP1 - Sustainable Manufacturing Solutions

3. Manufacturing for Circular Economy



DDS - Development of New Generation of Tools based on Scientific Rules for Performance and Sustainability

Principal Investigator: Victor Neto

Funding entity: ANI - Agência Nacional de Inovação, S.A./POCI 2020, **ID:** POCI-01-0247-FEDER-046977

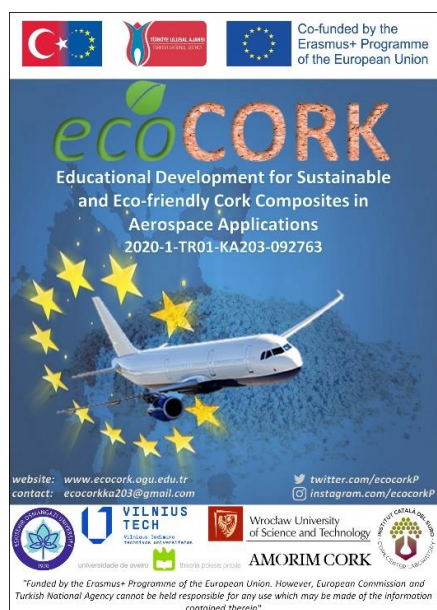
Total Budget: 817,057.03 €; **TEMA Budget:** 250,957.01 €;

Duration: From 2021 to 2023

TEMA Team: Tatiana Zhiltsova, Mónica Oliveira, Jorge Ferreira, António Gil Campos

Consortium: MOLDIT – Indústria de Moldes S.A., Universidade de Aveiro, and CENTIMFE – Centro Tecnológico da Indústria de Moldes, Ferramentas Especiais e Plásticos

Summary: Project DDS aims to develop a new generation of molding tools with high added value and high performance. To this end, it is intended to promote technological advances through the development of design rules based on thermomechanical optimization by finite elements, which ensure the requirements demanded by the market in terms of performance during the expected lifetime and integrate new structural characteristics that provide it with improved performance, with lower energy and raw material consumption and shorter cycle times. This project thus seeks to respond to the recurrent oversizing of moulding tools in terms of material and their properties.



ECOCORK - Educational Development for Sustainable and Eco-friendly Cork Composites in Aerospace Applications

Principal Investigator: Fábio Fernandes

Funding entity: ERASMUS+; **ID:** 2020-1-TR01-KA203-092763

Total Budget: 269,045.00 €; **TEMA Budget:** 51,270.00 €

Duration: From 2020 to 2023

TEMA Team: Ricardo Sousa; António Pereira

Consortium: Amorim Cork Composites, S.A.; Fundació Institut Català del Suro; Politechnika Wroclawska; Universidade de Aveiro; Vilniaus Gedimino Technikos Universitetas

Summary: ECOCORK aims to develop educational tools for gaining environmental awareness in the manufacturing of cork composites as well as understanding the importance of eco-friendly cork composites in the development of sustainable solutions for the aerospace industry.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

1. Multiscale technologies and devices for medicine, environment and energy

Creation of wellbeing in society by the development of materials and technologies for key areas such as medicine, environment and energy, namely by the promotion of:

- The development of novel sustainable and renewable nanocomposite materials for water remediation;
- Development of functional nanocomposites based on natural or synthetic polymers, graphenes, nanowires and inorganic nanoparticles with synergistic properties;
- Nanofluids for energy and heat transfer applications;
- Personalized biomaterials manufacturing: to develop scaffolds with the right cues for cell integration;
- Automated biomanufacturing of tissue and implant constructs;
- Define the future guidelines for the use of nanomaterials and nanotechnologies by promoting the research and implementation of effectiveness indexes, bridging the gap between the fundamental research and industrial true application of nanonengineering;
- Always stablish the procedures for safety handling and application of nano-based products.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

1. Multiscale technologies and devices for medicine, environment and energy

FLEXOBONE - Exploiting flexoelectricity to design osteoinductive electromechanical transducers

Principal Investigator: Nathalie Barroca

TEMA Team: Nathalie Barroca, António Completo, Robertt Valente

Funding entity: OE; **ID:** 2022.02424.PTDC

Total / TEMA Budget: 247,799.22 €

Duration: From February 2023 to February 2026

Summary: The project FLEXOBONE aims to explore novel scaffolding strategies that exploit flexoelectricity for bone tissue regeneration. It is a proof of concept that uses specific designs to harness flexoelectricity towards bone grafts that act as electromechanical transducers.



NEUROSTIMSPINAL - A step forward to spinal cord injury repair using innovative stimulated nanoengineered scaffolds

Principal Investigator: Paula Marques

Funding Entity: European Commission; **ID:** 829060 - FETOPEN-RIA-2018

Total Budget: 3,503,922.50 €

TEMA Budget: 1,075,260.00 €

Duration: From 2019 to 2023

TEMA Team: António Completo, Gonzalo Irurueta, Nathalie Barroca, Joana Sousa

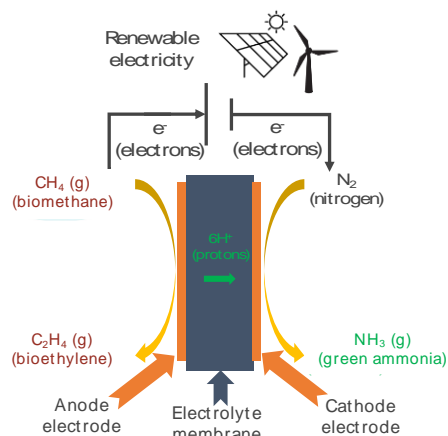
Consortium: UNIVERSIDADE DE AVEIRO, PT; FUNDACION TECNALIA RESEARCH & INNOVATION, ES; UNIVERSIDAD COMPLUTENSE DE MADRID, ES; STICHTING KATHOLIEKE UNIVERSITEIT, NL; FOUNDATION FOR RESEARCH AND TECHNOLOGY HELLAS, EL; GRAPHENEST S.A., PT; Stematters, Biotechnologia e Medicina Regenerativa SA, PT

Summary: This project proposes to develop a neural tissue engineered scaffold capable of not only combining fibrous and porous topographic cues in order to mimic the morphology of the native spinal cord, but also potentiating the properties of graphene related materials supported in a protein-rich decellularized matrix.

Mobilizing Projects

MP2 - Technologies for the Wellbeing

1. Multiscale technologies and devices for medicine, environment and energy



C2+toNH3 - Sustainable ammonia electrochemical synthesis via non-oxidative dehydrogenation of biomethane to ethylene using proton conducting membranes

Principal Investigator: Francisco Loureiro

Funding entity: FCT;

ID: 2022.02498.PTDC

<https://doi.org/10.54499/2022.02498.PTDC>

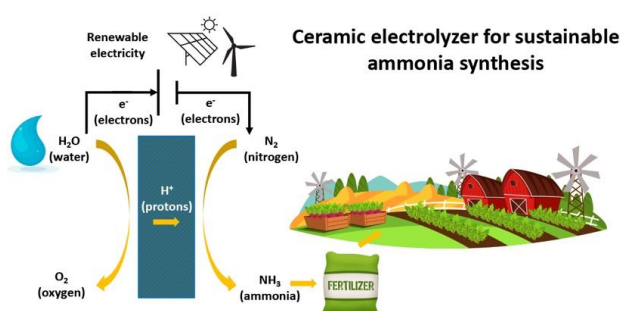
Total / TEMA Budget: 250,000.00 €

Duration: From 01/03/2023 to 28/02/2026

TEMA Team: Allan J. M. Araújo, Duncan Paul Fagg; Laura Holz

Consortium: Instituto de Cerâmica e Vidrio, CSIC Madrid (ICV/CSIC Madrid), Universidade Federal da Paraíba (UFPB), Brasil, Bondalti Chemicals, S.A., Portugal.

Summary: The project offers an alternative solution to the Haber-Bosch process for co-producing ammonia and bioethylene directly from biomethane and nitrogen using a ceramic electrolyzer. Ammonia and bioethylene can be formed without the liberation of carbon dioxide.



TMNs-NH3 - New generation of electrochemical ammonia formation membranes using nitride-based catalysts

Principal Investigator: Francisco Loureiro

Funding entity: FCT

ID: PTDC/CTM-CTM/2156/2020

Total / TEMA Budget: 250,000.00 €

Duration: From 2021 to 2024

TEMA Team: Duncan Paul Fagg; Aliaksandr Shaula; Laura Holz; Vanessa Graça

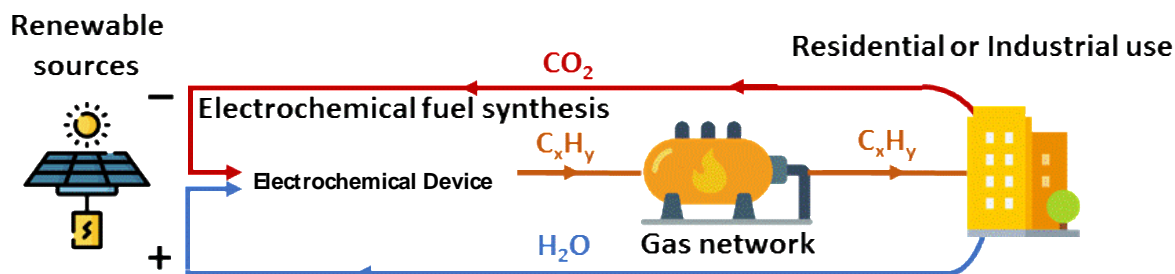
Consortium: Instituto de Cerâmica e Vidrio, CSIC Madrid (ICV/CSIC Madrid), Universidade Federal da Paraíba (UFPB), Brasil, Bondalti Chemicals, S.A., Portugal.

Summary: The project offers an alternative solution to the Haber-Bosch process for ammonia formation. It uses a ceramic electrolyzer to directly synthesize this chemical compound from water and nitrogen using renewable electricity. Ammonia can be formed without the liberation of carbon dioxide.

Mobilizing Projects

MP2 - Technologies for the Wellbeing

1. Multiscale technologies and devices for medicine, environment and energy



Hybrid-CO₂ Fuel - Direct conversion of CO₂ to synthetic fuel by hybrid electrolyser cells

Principal Investigator: Duncan Fagg

Funding entity: Fundação para a Ciência e a Tecnologia; ID: PTDC/QUI-ELT/3681/2020

Total / TEMA Budget: 249,999.96€

Duration: From 2021 To 2024

TEMA Team: Duncan Fagg, Francisco Loureiro and Laura Holz

Consortium: Duncan Fagg, J.T.S. Irvine, Luís Tarelho and Francisco Loureiro

Summary: This project aims to create an electrochemical device that will permit the direct conversion of CO₂ and H₂O to synthetic methane using renewable electricity.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

2. Innovative technologies for the smart cities

Future life quality will be assisted by the introduction of intelligent technologies in the daily life of people, contributing therefore to the smart city construction by:

- Innovations related to intelligent transportation systems, sustainable transportation and transportation safety, namely on: assessing the impact of the penetration of connected and/or driverless cars on traffic performance, emissions and road safety; Big Data analysis; Life Cycle Assessment of alternative materials, fuels and propulsion modes for transportation; non-motorized modes (namely, cycling mobility);
- Energy efficiency;
- Smart water management and control systems;
- Automation systems for wellbeing.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

2. Innovative technologies for the smart cities



Co-funded by
the European Union

SPOTLOG

SPOTLOG - Socially resPOnsible ciTy Logistics InnovaTions

Principal Investigator: Jorge Bandeira

TEMA Team: Eloísa Macedo; Joaquim Macedo; Margarida Coelho; António Bastos

Funding entity: Interreg Europe / European Union; **ID:** 01C0055

Total Budget: 2,324,550.00 € / **TEMA Budget:** 347,048.00 €

Duration: From 2023 To 2027

Summary: SPOTLOG's main vision is to involve local communities in creating socially responsible logistics systems, based wherever possible on zero-carbon modes, through the intelligent use of all available resources and taking advantage of the digitalisation of goods and passenger transport services.



Co-funded by
the European Union

EMBRACER

EMBRACER - Interconnecting Mobility Across European Cities and Suburbs

Principal Investigator: Jorge Bandeira

TEMA Team: Eloísa Macedo; Joaquim Macedo, Margarida Coelho, António Bastos.

Funding entity: INTERREG EUROPE / EUROPEAN UNION; **ID:** 01C0056

Total Budget: 2,134,842.00 € / **TEMA Budget:** 371,889.00 €

Duration: From 2023 To 2027

Summary: EMBRACER empowers underserved areas with improved regional mobility through better infrastructure, shared/autonomous transport, multimodal hubs, and a digitally connected transit network.

Mobilizing Projects

MP2 - Technologies for the Wellbeing

2. Innovative technologies for the smart cities



CISMOB – Cooperative information platform for low carbon and sustainable mobility

Principal Investigator: Jorge Bandeira

Funding Entity: EU/ERDF/INTERREG EUROPE

ID: PGI01611

Total Budget: 1,324,748.00 €

TEMA Budget: 540,244.00 €

Duration: From 2021 to 2023

TEMA Team: Eloísa Macedo, Margarida Coelho, António Bastos

Consortium: University of Aveiro, Stockholm University, Municipality of Agueda, Intelligent Transport Systems Romania – ITS Romania, Bucharest - Ilfov Inter-Community Development Association for Public Transport, Extremadura Energy Agency

Summary: Despite the new teleworking trends, our roads are increasingly congested while public transport still needs to recover pre-pandemic demand. After the covid-19 pandemic, the challenge of green and accessible mobility for everyone is becoming more complex. It is essential to provide attractive fares, safe payment systems and reliable updated ICT based info especially about occupancy and comfort levels, to incentivize passengers to select more sustainable mobility choices.



PAC Portugal AutoCluster for the Future

Principal Investigator: Margarida Coelho

Funding Entity: POCI 2020

ID: POCI-01-0247-FEDER-046095

Total Budget: 9,999,929.72 €

TEMA Budget: 175,302.49 €

Duration: From 2021 to 2023

Consortium: Simoldes S.A., Mobinov, CEiiA, INEGI, CENTI, INESC TEC, CCG, Universidade de Aveiro (DEM + DETI)







Summary: The PAC - Portugal AutoCluster for the Future is an initiative that aims to generate "know how" in the area of Mobility and Green Economy, linked to the vectors: 01. Connectivity & Digitalisation; 02. Sharing Economy; 03. Decarbonisation; 04. Concentration in Cities; 05. Mobility Growth. This project is led by Simoldes S.A. and its Executive Committee also includes Mobinov, CEiiA, INEGI, CENTI, INESC TEC and CCG. Many other entities, mainly connected to the Automotive Industry, Research (R & D), and Technical and Higher Education, have been added to this group.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

2. Innovative technologies for the smart cities

Coverage		Functionality		Sustainability	
					
Geographic area	Multi modality	Integration of services	IT personalization	Environmental policy	Social cohesion policy
5		2	1	2	3
4		1		2	
(5+4+2+1+2+3)/30 = 0,5					

PriMaaS - Prioritizing low carbon mobility services for improving accessibility of citizens

Principal Investigator: Jorge Bandeira

Funding entity: EU/ERDF/INTERREG EUROPE;
ID: PGI05830

Total Budget: 1,563,660.00 €; **TEMA Budget:** 395,224.00 €; **Duration:** From 2018 To 2023

TEMA Team: Margarida Coelho, Eloísa Macedo, Fernando Neto; José Paulo Santos, Sofia Suarez, António Bastos

Consortium: University of Aveiro, Intermunicipal Community of the Coimbra Region, TTS Italia, Intelligent Transport Systems Romania - ITS Romania, University of Applied Sciences Erfurt Liguria Region, eGovlab - Stockholm University, Council of Tampere Region, South East of Scotland Transport Partnership

Summary: The main vision of PriMaaS is to promote the integration of traditional collective transport modes with personal and innovative ones by creating equitable mobility services truly focused on citizens' needs. Regional and national policy instruments should be adapted to promote a fully integrated intermodal approach between all transport services, namely by using data provided and gathered in real time about both travel demand and travel supply.



Mobilizing Projects

MP2 - Technologies for the Wellbeing

2. Innovative technologies for the smart cities

EASEM - ErAsmus Sustainable Mobility

Principal Investigator: Margarida Coelho

Funding Entity: ECIU SMART-ER Seed Projects

Total Budget: 48,400.00 €; **TEMA Budget:** 15,800.00 €; **Duration:** From 2022 to 2023

Consortium: TEMA-UA, Aalborg University; Universitat Autònoma de Barcelona

Summary: The Erasmus program is one of the most successful European initiatives granting students with valuable learning and life experiences. In its 2021-2027 period, the program is expected to move 10 million European students. These students however will have significantly larger carbon footprints during their stay abroad than when studying back at home. On the other hand, most international students will make intensive use of public transportation, bike sharing systems (BSS) or other sustainable travel options on their day-to-day activities during their stays, offsetting some of their carbon emissions. Overall, however, very little is known on this balance between sustainable everyday travel and more frequent and carbon intensive leisure travel. This project will recruit a number of international Erasmus students incoming to the participating ECIU universities. We will estimate students carbon footprints and use study and control groups to test a variety of information and incentive-based interventions. At the end of their stay, we will analyse whether the intervention groups had lower emissions than the control group and whether having access to information, or sustainable mobility options is a significant contributor to lower carbon budgets among Erasmus students.



Doctorate in Mechanical Engineering

The Mechanical Engineering is one of the broadest technical-scientific areas of knowledge assuming a predominant role in the majority of the industrial activities. However, manufacturing and process industries over the world are facing unprecedented competitiveness challenges. Companies must provide new solutions and products at an ever-increasing rate, being flexible to meet changing market conditions as fast as possible. Moreover, it is fundamental to maximize productivity by reducing waste and energy consumption and by optimizing existing physical assets and human resources. The PhD in Mechanical Engineering at the University of Aveiro aims to contribute to bridge the gap between scientific knowledge and technological challenges in the Mechanical Engineering field.

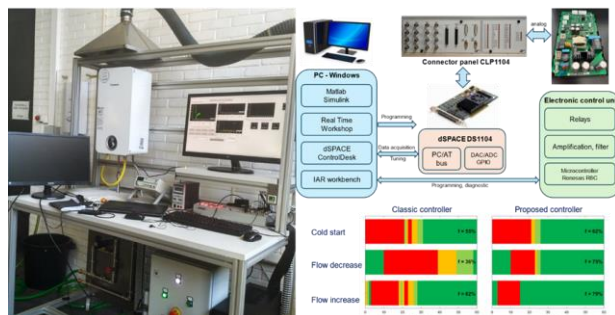
The researchers undergoing a PhD program in Mechanical Engineering tackle areas from:

- Fluids and Thermal Engineering;
- Structural Mechanics;
- Mechanical Technology;
- Robotics and Industrial Automation;
- Product Engineering;
- Biomechanics;
- Nanosciences and Nanoengineering.

Cooperation and mobilizing programs with International Academic Institutions and with the industrial sector have been carried out successfully and are continuously encouraged. Moreover, the research carried out by Lecturers and Researchers currently involved in the Program has been the subject of wide national and international recognition. The Doctoral Program is well involved within the R&D activities of the Research Unit, Centre for Mechanical Technology and Automation (TEMA).

Furthermore, it should be mentioned that the Mechanical Engineering Doctoral Program is a three year course, certified by the national competent authority (Agência de Avaliação e Acreditação do Ensino Superior - A3ES).

Doctorate in Mechanical Engineering



PhD student: André Figueiredo Quintã

Thesis title: Modelling, simulation and control of tankless gas water heaters: a hardware-in-the-loop approach

Supervisors: Prof. Jorge Ferreira,
Prof. Nelson Martins

Summary: This work aims to develop methodologies and tools to implement and evaluate tankless gas water heaters advanced control strategies with improved comfort, in addition to higher sustainability and lower environmental impact.

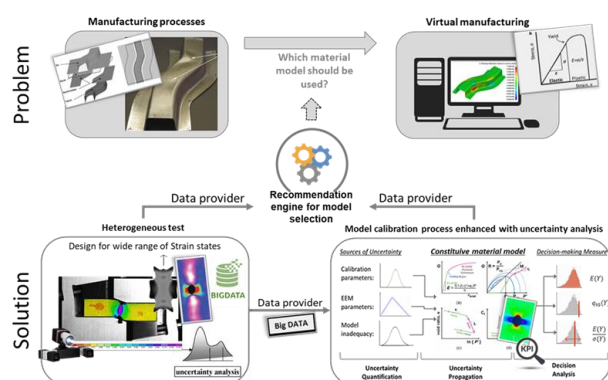


PhD student: António José da Fonseca Festas

Thesis title: Case studies of titanium alloy machining with application in medical devices manufacturing

Supervisors: Prof. J. Paulo Davim, Prof. António Ramos

Summary: This work aims to compare the machinability, through machining case studies, of titanium wrought alloys and titanium obtained through additive manufacturing. A hybrid manufacturing case study is the summit of all the research carried out.



PhD student: Mariana Peneda Conde

Thesis title: Recommendation engine and uncertainty techniques for the efficient calibration and selection of thermomechanical constitutive models

Supervisors: Prof. António Andrade-Campos,
Prof. Sam Coppieters (KU Leuven, BE)

Summary: This PhD aims to develop KPIs for the selection of accurate constitutive models as a recommendation engine that will support the decision for an adequately calibrated model, guaranteeing that the material is well reproduced. A dedicated test involving non-homogeneous strain fields and complex strain paths will be designed to reduce the material-testing campaign.

Doctorate in Mechanical Engineering

Graphical Abstract: Integrated research focused on:

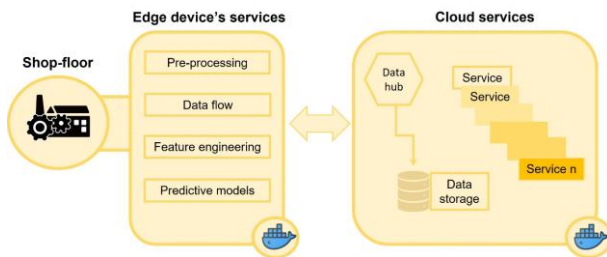


PhD student: Elisabete dos Santos Ferreira

Thesis title: Safety and Emissions Algorithms for the Interaction with Vulnerable Road Users

Supervisors: Prof. Margarida Coelho, Dr. Eloísa Macedo

Summary: The contribution of this Ph.D. research is to develop tools capable of identifying near-crashes and emissions hotspots and also to develop innovative applications for vehicles in order to assist drivers in making better informed and calmer driving decisions.

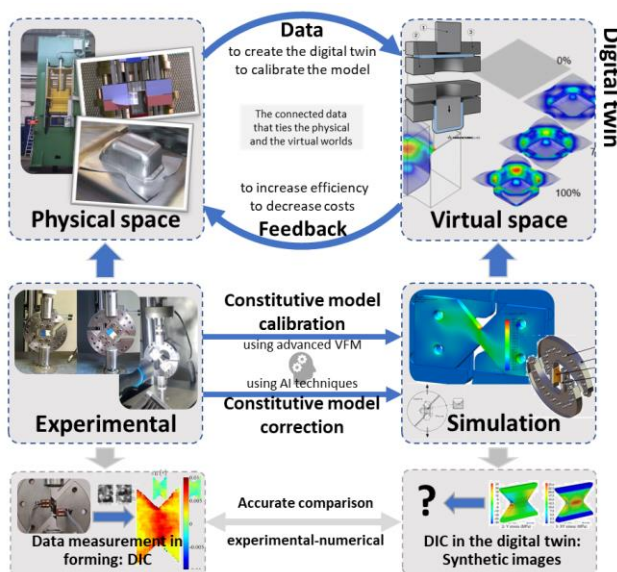


PhD student: Pedro Alexandre Almeida Nunes

Thesis title: Using smart edge devices and Big Data analytics for predictive maintenance

Supervisors: Prof. José Paulo Santos, Prof. Eugénio Rocha

Summary: The main objective of this PhD work is to develop generalized predictive maintenance models and a decentralized architecture that comprises edge and cloud computing to optimize maintenance interventions in different industrial scenarios, ensuring high scalability and resource availability.



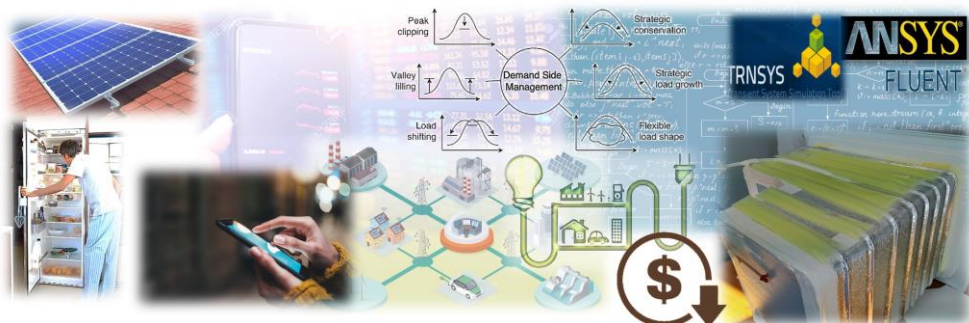
PhD student: João Diogo Figueira Henriques

Thesis title: Digital twin development in metal forming: calibration aided by digital image correlation and artificial intelligence

Supervisors: Prof. António Andrade-Campos, Prof. José Cardoso (UNL, PT)

Summary: The goal of this PhD is to design a metal forming digital twin through: (i) the calibration of constitutive models using VFM; (ii) the approximation of the digital and experimental worlds via synthetic images construction and (iii) the development of a corrector using artificial intelligence.

Doctorate in Mechanical Engineering

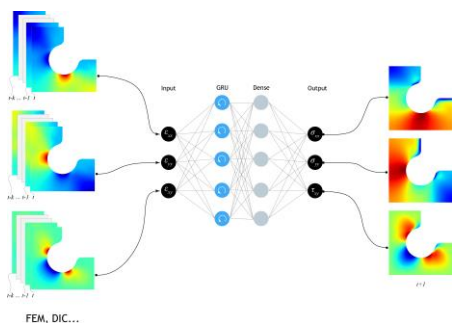


PhD student: Daniel Lemos Marques

Thesis title: Efficient and Sustainable Refrigeration Systems Integrating Tailored Heat Storage Materials

Supervisors: Prof. Fernando Neto, Prof. Nelson Martins

Summary: In refrigeration, dynamic models are vital to predict the effects of new control algorithms. The main goal is to provide a modelling approach for the challenges posed by integrating phase change materials in refrigeration systems for renewable energy sources and energy consumption demand-side management in the context of smart electricity grids.



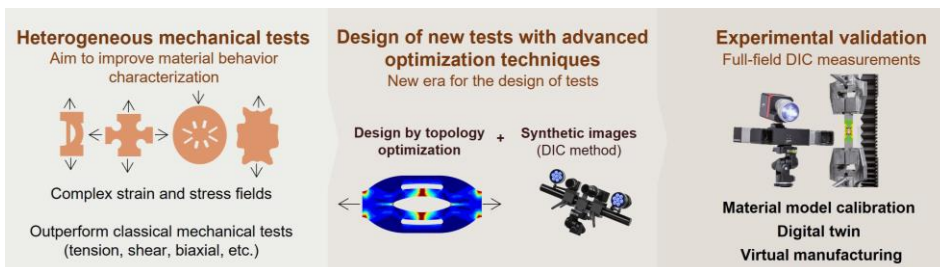
PhD student: Rúben Miguel Borges Lourenço

Thesis title: Towards Virtual Forming and Design: Implicit material modelling using AI techniques and big data generation

Supervisors: Prof. António Andrade-Campos, Prof. Pétia Georgieva (DETI, UA)

Summary: This PhD aims to develop efficient and accurate data-driven material models based on Machine Learning techniques, specifically Artificial Neural Networks, to be used in FEM simulations of sheet metal forming processes.

Doctorate in Mechanical Engineering

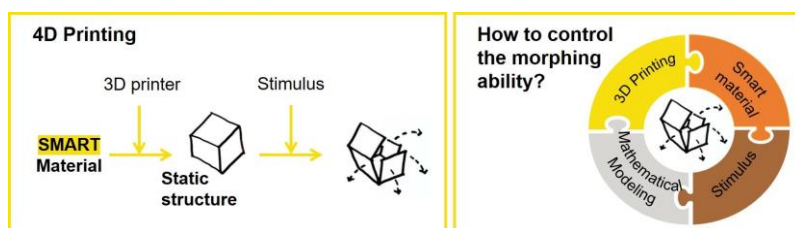


PhD student: Mafalda Pereira Gonçalves

Thesis title: Design of novel heterogeneous thermomechanical tests using topology-based optimization methodologies

Supervisors: Prof. António Andrade-Campos, Prof. Sandrine Thuillier (IRDL, FR)

Summary: The main goal of this PhD work is to design an innovative single mechanical test that can fully characterize the mechanical nonlinear behavior of sheet steels using topology optimization methodologies. This test aims to contribute to a more accurate and cost-efficient calibration of material constitutive models.



PhD student: Mylene Simões Cadete

Thesis title: Development of predictive tools for controlling the polymers morphing behavior in 4D printing

Supervisors: Prof. Victor Neto, Dr. Idalina Gonçalves (DEMaC, UA)

Summary: The aim is to create a prediction tool for 4D printing that automates decision-making for shape-changing structures. Factors such as material composition, printing technique, product requirements, and shape-changing mechanisms are considered for controlling morphing accurately. The goal is to improve the efficiency and effectiveness of 4D printing.

Doctorate in Mechanical Engineering

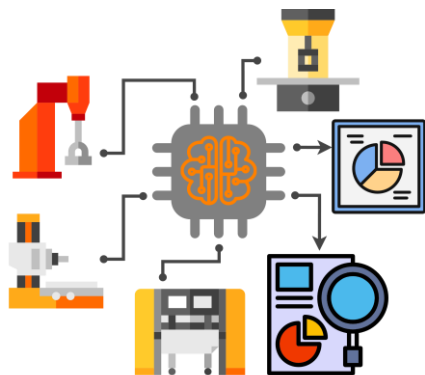


PhD student: Raul Nunes Simões

Thesis title: Development of luminescent tracers based on the valorization of recycled common use thermoplastics

Supervisors: Dr. Gil Gonçalves, Prof. Teresa Monteiro (DFís, UA), Prof. Victor Neto

Summary: This work's focus is the fabrication of luminescent carbon dots (CDs), allowing the design of a controlled spatial manner with singular optical fingerprints in a polymer matrix for the tracing and security of polymeric products. It's intended to enhance the value of plastic waste in everyday life to large-scale production of CDs in a direct current flash Joule heating (DC-FJH) chamber with well-defined photoluminescent properties. These fluorescent tracers will be explored in additive manufacturing on the 3D design of QR codes. An Arduino-based reader will be developed to create an agile method to read the information incorporated into the tracer. These CDs optical codes can be valuable for tracing products and goods or guaranteeing their quality and safety.



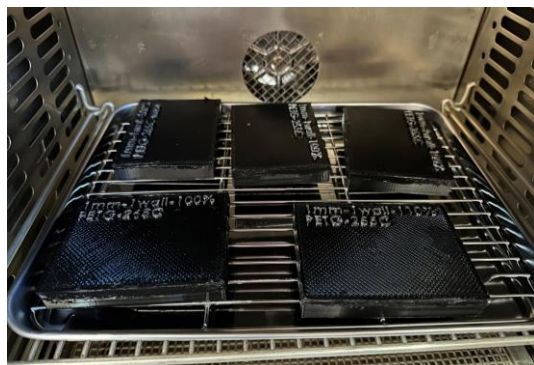
PhD student: Diogo Filipe Duarte Costa

Thesis title: Development of Embedded Maintenance Algorithms for Equipment Failure Forecast

Supervisors: Prof. José Paulo Santos, Prof. Eungénio Rocha (DMat, UA)

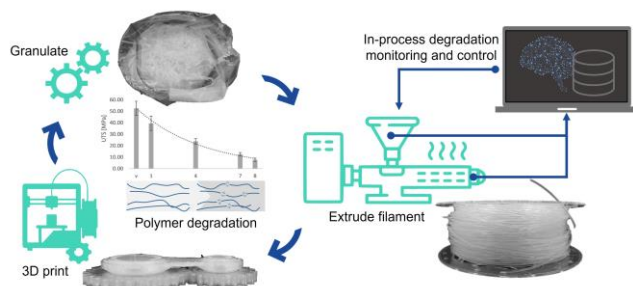
Summary: The doctoral thesis aims to enable smarter and less resource-intensive approaches to analyzing high-volume manufacturing data through the development of computationally efficient algorithms deployed within constrained devices operating close to physical processes, integrated in a decentralized platform for Predictive Maintenance.

Doctorate in Mechanical Engineering



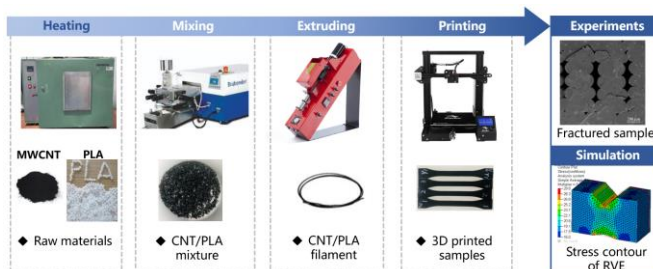
PhD student: Miguel Ângelo da Cunha Moreira
Thesis title: 3D Printed PCM Macroencapsulation – Development and Optimization of PCM Macroencapsulation Processes and Systems
Supervisors: Prof. Tiago Silva, Prof. João Oliveira, Prof. Fernando Neto

Summary: Development and optimization of an additive manufacturing machine and method to reliably and repeatably produce Phase Change Material (PCM) filled polymeric capsules, to be incorporated in thermal regulation systems.



PhD student: Tiago Emanuel Pereira Gomes
Thesis title: Enabling closed loop additive manufacturing through an on-demand feedstock material customization system
Supervisors: Prof. Victor Neto, Prof. João Oliveira

Summary: The main goal of this work is to increase the number of recycling cycles an extruded and 3D printed plastic can be subjected to with minimal application downgrade. It aims to do it using in-process, non-destructive material degradation assessment, prediction, and mitigation through a chain extender additive.



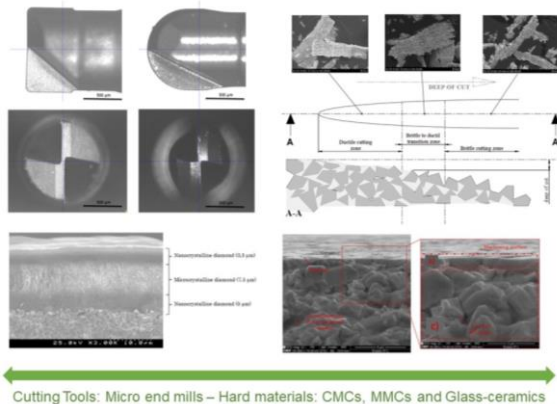
PhD student: Yiyun Wu

Thesis title: Mechanical investigation of thermoplastic-based nanocomposites fabricated by additive manufacturing

Supervisors: Prof. Victor Neto, Prof. Robertt Valente

Summary: The present work focuses on both experimental investigation including mechanical, thermal and morphological properties, and numerical analysis of carbon nanotube reinforced polylactic acid composites manufactured by fused filament fabrication.

Doctorate in Mechanical Engineering

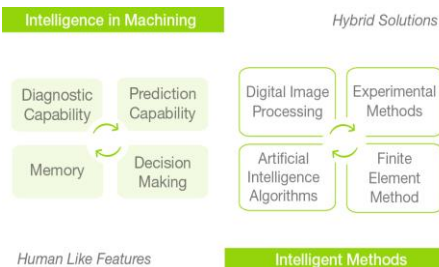


PhD student: Daniel Amaral de Figueiredo

Thesis title: Micromilling of hard materials

Supervisors: Prof. J. Paulo Davim,
Dr. Cristina Fernandes (Palbit)

Summary: PhD research seeks to identify main factor involved at micromilling of hard materials focus ceramic matrix composites (CMCs), metal matrix composites (MMCs) and Glass-ceramics, having potential applications in a number of different challenging areas. The deliverable of this research will be: 1. Characterization of micromilling process, main mechanisms and factors, with a major concern to cutting mode and size effect; 2. Cutting tools performance and development of new endmills tools dedicated to micromilling applications on hard materials.



PhD student: Sílvia Daniela Ribeiro Carvalho

Thesis title: Intelligent and Sustainable Machining Methods for Titanium Alloys

Supervisors: Prof. J. Paulo Davim, Dr. Ana Horovistiz

Summary: The aim goal is to achieve hybrid solutions based on experimental trials and computational methods such as finite element analysis, digital image processing, artificial intelligence algorithms will be explored to analyse the response variables during real machining processes (which are the cutting forces, temperature gradient, tool wear, metal chip morphology, surface integrity), to develop material and processes models, to optimize the cutting processes and introduce intelligent features into the machining process.

Doctorate in Mechanical Engineering

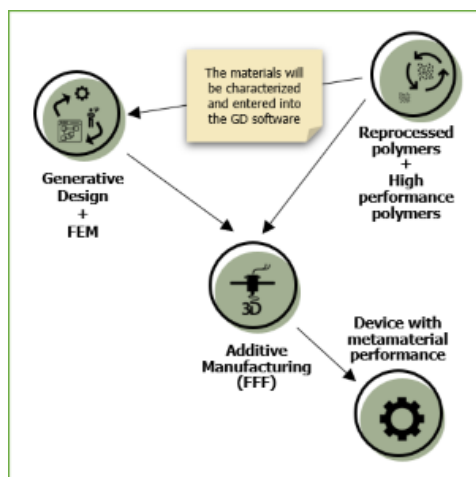


PhD student: Carlos Miguel Vieira Correia

Thesis title: Continuous processing of density graded and rigid thermoplastic bio-foams

Supervisors: Prof. Victor Neto, Dr. Idalina Gonçalves (DEMaC, UA)

Summary: The objective of this PhD is to establish a continuous manufacturing procedure for density graded foams based on thermoplastic starch (TPS). This study will allow to create new knowledge on the processability of TPS and to explore the role of advanced processing technologies in the development of new foam morphologies.



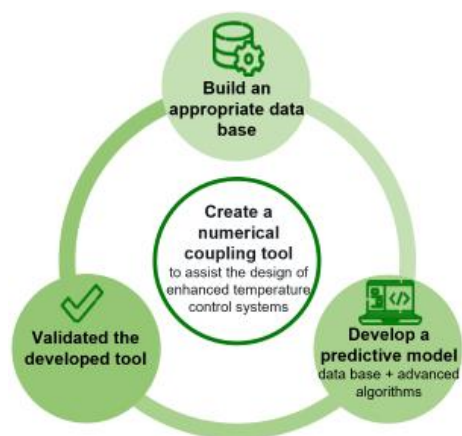
PhD student: Laura Santos Prior

Thesis title: Generative design to model metamaterial devices using reprocessed plastics

Supervisors: Prof. Victor Neto, Prof. Mónica Oliveira

Summary: The purpose of this work is to show that reprocessed polymers can be designed to create devices that meet specific requirements. By using additive manufacturing technologies like Fused Filament Fabrication with carefully selected materials arranged in a specific way, metamaterials can be created. These metamaterials will improve the performance of devices when they are used in challenging conditions and require low energy consumption and lightweight design.

Doctorate in Mechanical Engineering

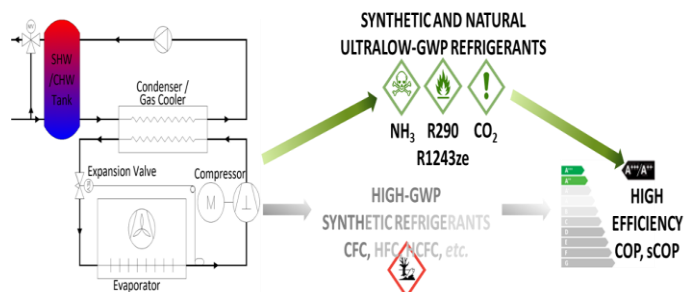


PhD student: Sofia Barroca Monteiro Aleixo Rocha

Thesis title: Coupling tool to assist design and engineering of mold temperature control systems by topology optimization and hybrid fabrication

Supervisors: Prof. Mónica Oliveira, Prof. Victor Neto

Summary: The present proposal intends to explore design freedom granted by AM, to envisage new and enhanced temperature control systems in injection molds and develop a tool to assist the design of these systems. The latter relies upon the construction of a representative database of typical coupled behavior process-mold durability scenarios for training advanced algorithms.



PhD student: Francisco José Craveiro Bispo Pocinho Lamas

Thesis title: Development of Vapor Compression Heat Pumps, and Virtual Bench for the Development of Vapor Compression Heat Pumps

Supervisor: Prof. Vítor Costa

Summary: Development towards improvements of vapor compression heat pumps for space and water heating, and developments of a virtual test bench for helping their development.

PhD student: Luís João Soares de Sousa Rodrigues

Thesis title: Thermal Energy Storage for Load and Power Management with Solar Energy in Domestic Refrigeration Systems

Supervisors: Prof. Jorge Ferreira, Prof. Vítor Costa

Summary: Development of innovative solutions for low-temperature thermal energy storage (cold storage) for load and power management with solar energy in domestic refrigeration systems.



Doctorate in Mechanical Engineering

PhD Student: Ana Paula Carvalho Delgado

Thesis title: Development of a New Domestic Furnace Prepared for Burning Gas Mixtures Including H₂

Supervisors: Prof. Vítor Costa

Summary: Development of the cavity of a new domestic oven prepared to use natural gas mixtures including H₂; work developed in cooperation with a Portuguese company leader in the domestic ovens design and production.

PhD Student	Thesis title	Supervisors
Álvaro Filipe Marques Ferreira Proença Pires	Crack Analysis in LASER Welding of Dissimilar Materials	Prof. António Bastos
Daniel Jesus Camarneiro	Microservices development for industrial equipment integration and analysis in 5G platforms for automation	Prof. José Paulo Santos Prof. Rui Aguiar (DETI, UA)
Eva Soledade Vaz Marques	Quality Assurance of laser welding in DP1000 steel	Prof. António Bastos Prof. Francisco Silva (ISEP, IPP)
Gabriel Ferreira Serra	Materials, design and biomechanics for safer micromobility	Prof. Fábio Fernandes Prof. Ricardo Sousa
Lucas Azevedo Das Neves	Active dynamic control approach to reduce noise and vibration of heat pumps	Prof. Rui Moreira Dr. Juergen Herbst (BOSCH, DE)
Mehran Ghasempourmouziraji	Optimization of process parameters in Laser Metal Deposition to improve part accuracy, mechanical and microstructural properties	Prof. Daniel Afonso Prof. Ricardo Sousa
Pedro Miguel Lopes Rolo	Towards self-adaptable hybrid electromagnetic-triboelectric 3D generation (PulsarHarvesting)	Prof. Marco Santos Prof. Luís Alves (DETI) Dr. Andrei Kholkin (DFís)
Pedro Miguel Rocha Carneiro	Self-adaptive electromagnetic energy harvesting system	Prof. Marco Santos Prof. Jorge Ferreira Prof. Raúl Santos (UTAD)
Tiago Filipe Crispim Pereira	Bio-inspired Approach for Robotic Manipulation: Shoulder Complex and Muscle Actuation	Prof. António Andrade-Campos



Doctorate in Energy Systems and Climate Change

General objectives:

Provide the knowledge, techniques, and systemic vision required to produce scientifically relevant contributions involving the design, analysis, control and operation of systems that support energy, material, and information flows, in particular regarding, conversion, transport, storage and use of energy, taking into account the availability of natural resources and their relation to climate change, including the study of their mitigation and resilience factors for adaptation to climate change. The main characteristic of this doctoral program is its holistic view, integrating areas of engineering and environment with those of economics and management, providing an analysis of energy systems from the perspective of sustainable development. It is also an objective of the doctoral program to gradually qualify students for the autonomous development of research and development work by integrating them into research teams with a special emphasis on the preparation and elaboration of the thesis.

Learning objectives associated with the curricular units of the doctoral program, including the Thesis:

To provide capacity for the analysis, understanding and quantification of energy and mass flows in contemporary societies and their relationship with natural resources, technologies, policy, management and climate change;

To provide skills and methods for the development of research projects in the field of energy (conversion, transport, storage and use) and climate change (reduction and mitigation of the effects) and sustainability;

To know, understand and apply computational and laboratory techniques and methodologies relevant to the development of RTD activity in major areas with the potential to develop research projects associated with the study of energy systems and climate change;

To provide the capacity to develop, in a systematic and autonomous way, bibliographic review procedures, including bibliometric analysis, aiming at the identification of the state of the art in a previously defined area of knowledge;

To give the capacity to identify the needs, and to design and perform scientific research, in respect of the requirements imposed by academic quality and integrity standards, in a progressively autonomous way;

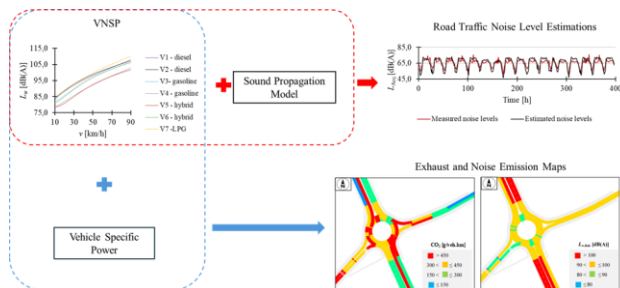
To develop scientific communication skills that allow the presentation, in written and oral form, of research results in national or international conferences and/or publications with scientific revision;

Develop critical thinking about the importance of energy, energy systems, and their interaction with the environment and society;

To enable the exploitation of scientific, technological, social and economic progress in the academic and/or professional context, in a knowledge-based society.



Doctorate in Energy Systems and Climate Change

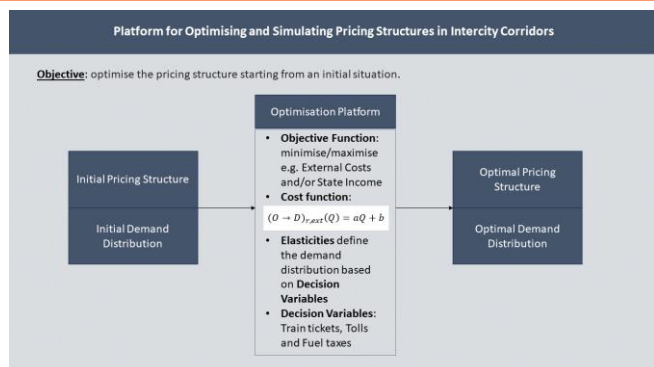


PhD student: Antonio Pascale

Thesis title: An Integrated Assessment of Road Traffic Noise and Pollutants Critical Hotspots through Advanced Models

Supervisors: Prof. Margarida Coelho, Prof. Claudio Guarnaccia (UNISA, IT)

Summary: This Ph.D. Thesis aims to develop the Vehicle Noise Specific Power (VNSP) model capable of estimating sound power levels by fuel type. Coupled with a sound propagation model, VNSP accurately evaluates road traffic noise, and when integrated with the Vehicle Specific Power (VSP) methodology, assesses vehicle noise and exhaust emissions network-wide.



PhD student: Carlos Jorge Batista Sampaio

Thesis title: Evaluation of impacts on intercity corridors for efficient and sustainable mobility – innovative ways to address corridors pricing

Supervisors: Dr. Jorge Bandeira, Dr. Eloísa Macedo, Prof. Margarida Coelho

Summary: This PhD Thesis evaluate the contribution of optimal traffic distribution in intercity corridors to reducing transport-related externalities and estimate how different pricing structures and strategies can lead to optimal traffic solutions.



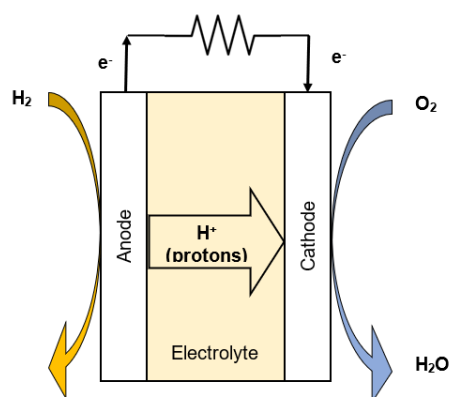
PhD student: Mónica Joana Morgado Rodrigues

Thesis title: Decision support system for accessing costs and risks of connected and automated vehicles as mobility service in urban contexts

Supervisors: Dr. Jorge Bandeira, Dr. Maria Costa

Summary: The main objective of the PhD is to assess whether connected and automated vehicles (CAVs) could be effective mobility solutions for improving social, economic, and environmental efficiency by developing a decision-support tool driven by data analysis and modelling processes.

Doctorate in Energy Systems and Climate Change

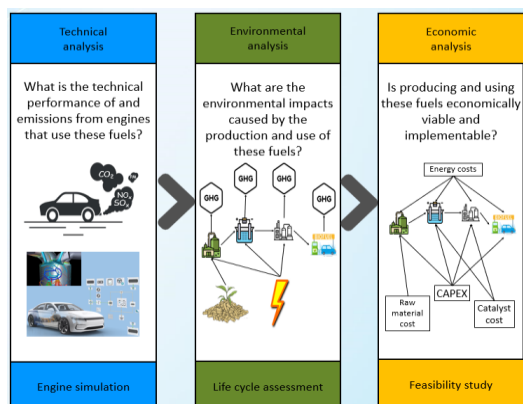


PhD student: Carlos Manuel Rodrigues de Almeida

Thesis title: Proton ceramic electrolytes functioning in the intermediate temperature range, 300-600 °C

Supervisors: Dr. Duncan Fagg, Dr. Francisco Loureiro

Summary: We aim to design fast proton conductors to be used as electrolyte membranes that can operate in the intermediate temperature range (300-600°C). The proposed objectives involve the design of fuel cells and electrolyzers, to either be used in the production of electricity or clean fuels, respectively.



PhD student: Jayakrishnan Kaliyarmattom Ravindran

Thesis title: Integrated impact of liquid green fuels from electrochemical biogas

Supervisors: Prof. Margarida Coelho, Prof. Nelson Martins

Summary: This PhD aims to address the technical, environmental, economic, and policy factors associated with the production and use of liquid green fuels through the electrochemical conversion of biogas through an engine simulation, lifecycle assessment, and feasibility study.



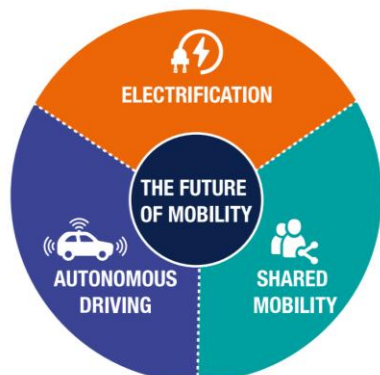
PhD student: Luís Filipe Marques da Silva Martins

Thesis title: Study, Modeling and Simulation of Solar Façade for Heating and Ventilation

Supersivor: Prof. Fernando Neto

Summary: Thermal hybrid façade study for its multiple layouts (air heating, water heating and hybrid mode) under different weather conditions. Data gathering for characterizing the device performance. Artificial neural networks development which depict the façade performance.

Doctorate in Energy Systems and Climate Change



PhD student: Mariana Isabel Carvalho Vilaça

Thesis title: Integrated Impact Assessment of Shared, Automated and Electric Mobility

Supervisors: Prof. Margarida Coelho,
Prof. Gonçalo Correia (TUDelft, NL)

Source: Dupray, V., Otto, P., Yakovlev, A., 2019. THE FUTURE OF MOBILITY - Autonomous, electric and shared.

Summary: 1) Assess the life cycle impacts of shared automated and electric mobility; 2) Evaluate how human behavior and adoption strategies may affect the impact of the mobility system; 3) Evaluate the viability of the mobility systems at urban and interurban scales.



PhD student: Michael Anthony Martins Tavares Russo

Thesis title: Decarbonizing Portugal: impact of climate change on renewable energy resources

Supervisors: Dr. Alexandra Monteiro (DAO, UA),
Prof. Nelson Martins, Dr. David Carvalho (DFís, UA)

Summary: This thesis aims to fill the knowledge gap regarding the technical impacts and costs of climate change on renewable energy resource variability. The main objective is to quantify these impacts using high-resolution weather prediction modelling at a national scale in Portugal. A multi-criteria decision analysis will be applied to choose the optimal balance between energy supply decarbonisation and costs. This work will support the decision-making process and achieve national and EU energy goals.

PhD Student	Thesis title	Supervisors
António José Queijo Duarte	Production and Consumption Systems Management Algorithms in Smart Grids	Prof. José Paulo Santos
Elisa de Moura Scortegagna	Buildings Operational Performance Analysis: evidence-based calibration with uncertainty and sensitivity analysis	Prof. Nelson Martins Prof. Roberto Lamberts (USFC, BR)
Micael Bastos Rebelo	Platooning optimization with mixed vehicle arrangements based on performance and environmental indicators	Dr. Jorge Bandeira Dr. Sandra Rafael (DECivil)
Sílvio Diniz de Lourenço Junior	Development of technologies to reduce energy poverty	Prof. Fernando Neto Prof. Nelson Martins



Doctorate in Nanosciences and Nanotechnology

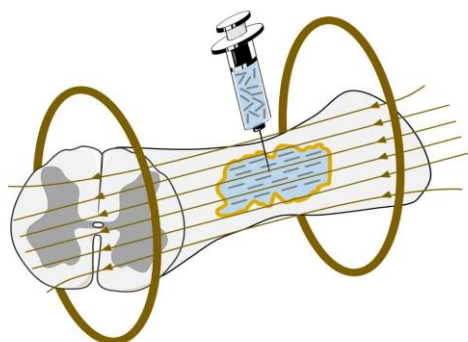
Nanosciences and Nanotechnology (N&N) aim to understand, control and manipulate the matter at a nano-scale (typically from 1 to 100 nm) where unique physicochemical and biological phenomena take place, which can be explored in new applications. The DP in N&N aims to train highly qualified specialists able to master concepts across conventional areas of knowledge and to design future developments in N&N, while promoting/undertaking productive and transformative activities, and also contributing to environmental sustainability and social progress.

The DP in N&N intends to:

- Provide strong cross- and inter-disciplinary training in an area with great technological propensity.
- Promote an entrepreneurial spirit to create nanotechnology-based companies.
- Respond to the growing demand for professionals with advanced interdisciplinary N&N training.
- Expand horizons of employability, environmental sustainability, personal fulfilment, and social progress.

Other Doctoral Programs

Doctorate in Biotechnology – University of Aveiro

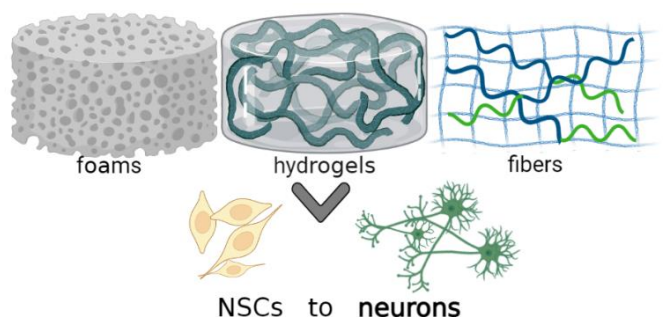


PhD student: Joana Patrícia Marques de Sousa

Thesis title: Anisotropic 3D scaffolds for spinal cord regeneration

Supervisors: Dr. Paula Marques, Prof. João Mano (DQ, UA), Dr. Emmanuel Stratakis (IESL, GR)

Summary: The purpose of this research is to determine if biomaterials with anisotropic properties that mimic the native tissue's structural complexity of human spinal cord can guide neurons longitudinally and form functional neural networks with the aim of repairing lesioned areas.



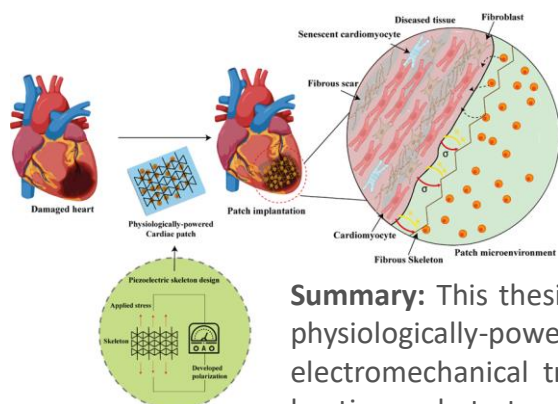
PhD student: Daniela Moreira da Silva

Thesis title: Electroconductive regenerative strategies for the spinal cord injury

Supervisors: Dr. Nathalie Barroca, Dr. Paula Marques

Summary: This thesis, within the framework of the NeuroStimSpinal project, is dedicated to the manufacture of different electroconductive platforms, with an optimized combination of chemical, mechanical and topographic features that should mimic the spinal cord tissue and lead to neural tissue regeneration.

Doctorate in Nanosciences and Nanotechnology



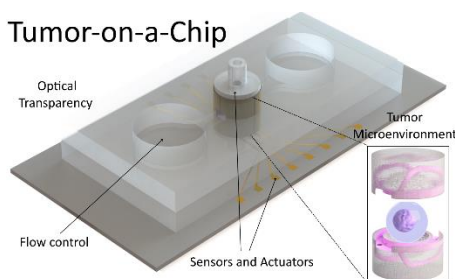
PhD student: Luís Filipe Miranda do Nascimento

Thesis title: Physiologically-powered cardiac patch for in situ electrical stimulation

Supervisors: Dr. Nathalie Barroca, Dr. Priscila Melo (NCL, UK), Dr. Gavin Richardson (NCL, UK)

Summary: This thesis is dedicated to conceptualizing and developing a physiologically-powered cardiac patch which acts as an electromechanical transducer using the strains provided by the heart beating cycle to transmit an electrical stimulus without the need of any complex additional stimulation device. This will rely on exploiting specific electromechanical couplings, such as piezoelectricity, in biocompatible and biodegradable polymers.

Tumor-on-a-Chip



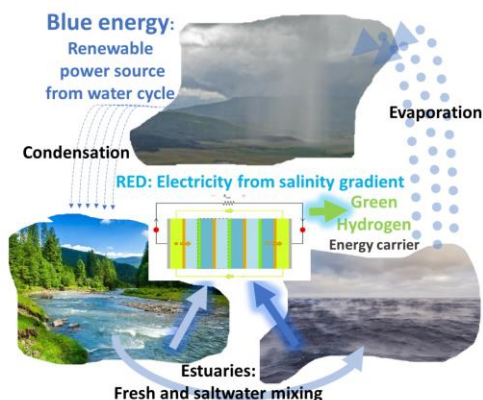
PhD student: João Ferreira Gil

Thesis title: Engineering self-regulating Tumor-on-a-Chip to model the dynamic microenvironments of realistic tumors

Supervisors: Dr. Gil Gonçalves, Dr. Vânia Silveiro (IST, PT), Dr. Carla Moura (IPL, PT)

Summary: This PhD aims to develop a 3D tumor models with dedicated vascularization and sensing and actuator elements integrated with the microenvironment, maintaining and monitoring biophysical/biochemical parameters during all stages of the tumor development. The goal is to provide fundamental knowledge that allows to correlate the structural features of the tumor with its progression and severity. 3D tumor models can become powerful enablers of higher-throughput screening of early stage anti-cancer drugs, easily replacing the routine in vivo tests.

Doctorate in Nanosciences and Nanotechnology

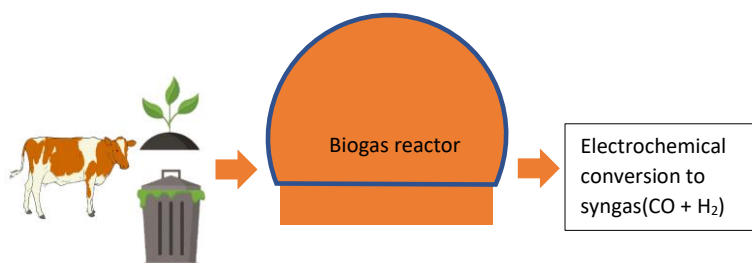


PhD student: Eduardo Jorge Nunes Durana

Thesis title: Energy production by salinity gradients

Supervisors: Dr. Duncan Fagg, Dr. Francisco Loureiro, Prof. Nelson Martins

Summary: The aim of this thesis is to develop technology for electricity production using Salinity Gradient Energy (SGE), also known as blue energy. This, based on a Reverse Electro Dialysis (RED) device, that is able to generate electrical power from the interface of river and seawaters.



PhD student: Alfredo Sango Buzi Luemba

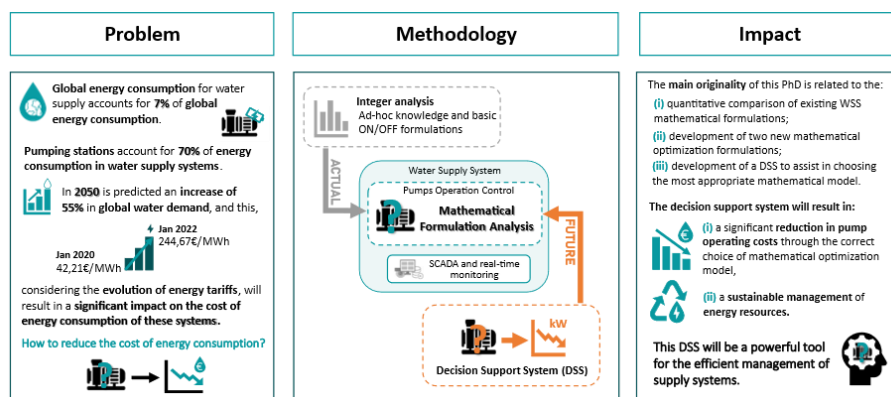
Thesis title: Development of novel chalcogenide electrolytes for proton ceramic membrane reactors

Supervisors: Dr. Francisco Loureiro, Dr. Duncan Fagg

Summary: The main goal of this study is to develop novel electrolytes for Proton Ceramic Membrane Reactors (PCMRs). The idea is to study an electrochemical device able to form green syngas (CO and H_2) from a biogas precursor ($\text{CO}_2 + \text{CH}_4$).

Other Doctoral Programs

Doctorate in Industrial Engineering and Management – University of Aveiro



PhD student: Marlene Gomes Brás

Thesis title: Energy sustainability of water supply systems through optimization methodologies

Supervisors: Prof. Ana Moura (DEGEIT, UA),
Prof. António Andrade-Campos

Summary: The main goal of this PhD is to develop a methodology capable of efficiently managing a WSS, i.e., finding the optimal operation of any WSS in terms of energy consumption and cost reduction. This goal is achieved by developing a novel mathematical optimization model for both fixed-speed (FSP) and variable-speed pumps (VSP) water networks and dynamic pricing tariffs. Besides, a decision support tool design will be developed in order to assist water management companies in choosing the most efficient formulation for their WSS.



Associated Laboratories Member



LEAD R&D UNIT: ALGORITMI Research Center

PARTICIPANT R&D UNITS:



Universidade do Minho



INSTITUTO
POLITÉCNICO
DO CÁVADO E DO AVE



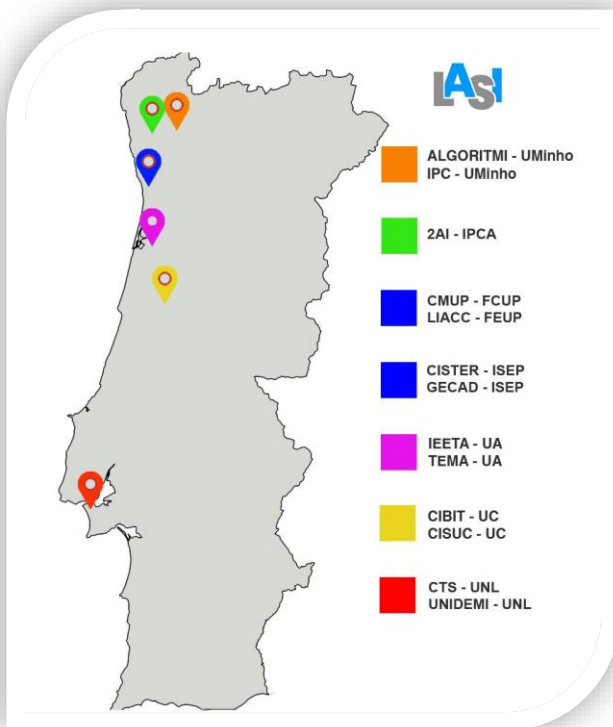
universidade
de aveiro



UNIVERSIDADE D
COIMBRA



UNIVERSIDADE
NOVA DE LISBOA



LASI – Thematic Lines

Five inter-disciplinary research thematic lines make the focus of LASI.

Such thematic lines aim to research and make important progresses in the fields of :

- (i) Innovative and Sustainable Industries, with a strong focus on Industry 5.0;
- (ii) Smart Cities, Mobility and Energy, allowing cities of the present to develop multiple IS over their ecosystem;
- (iii) Health and Well-being, with a focus on improving the quality-of-life of every individual;
- (iv) Infrastructures and Highly Connected Society, focusing on the inclusion of people as active and proactive actors of the technological ecosystem;
- (v) Public Administration and Governance, accelerating the digital evolution of governments and municipalities.



TEMA Scientific indicators

FCT Accomplished Indicators

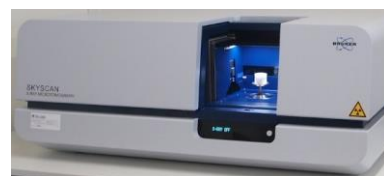
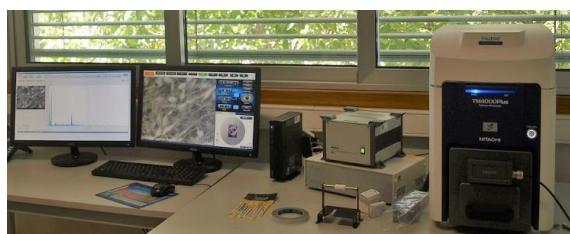
^a Approved in 2023

Indicators	2023
Books	10
Book Chapters	8
International Scientific Papers	197
International Scientific Presentations (Invited talks; Oral and Poster Presentations)	160
National Scientific Presentations (Invited talks; Oral and Poster Presentations)	17
Scientific Events Organization	16
Dissemination Activities (for companies, youngers and general public)	32
PhD Thesis (concluded)	6
MSc Dissertations (concluded)	159
Models and Computational Apps	5
Pilot installations and prototypes	4
Patents	9
Researcher/student grants (ERC; Marie Curie; FCT; etc.)	53
Projects (FCT, Regional; National; European; Society)	51

FACILITIES AND SERVICES

The infrastructure TEMA is able to offer services (e-mail: tema.services@ua.pt) of / in the following laboratories and/or equipment/intervention areas:

- Mechanical testing laboratory - ISO9001 Certified Laboratory ;
- Machining and Tribology laboratory;
- Nanotechnology laboratory;
- CVD laboratory;
- Structural Dynamics Laboratory;
- Flexible Production System laboratory;
- Computational Injury Biomechanics Laboratory ;
- Additive Manufacturing and Prototyping Laboratory;
- Biomechanics Laboratory;
- Sustainable Energy Systems laboratory;
- Welding laboratory;
- Materials Characterization laboratory;
- Energy Efficiency Laboratory;
- Thermo-Physical Properties laboratory;
- Metallography laboratory;
- Simulation and experimentation in biomechanics;
- Test of sensors for car and oil industry;
- Development/experimentation of industrial equipment;
- Homogenization properties of composite materials;
- Plastic anisotropy and constitutive modeling;
- Simulation and experimental sheet forming processes;
- Hydrogen production;
- Diamond coatings;
- Production of fuel cells;
- Testing internal combustion engines;
- Cogeneration systems;
- Analysis of performance and life cycles;
- Building models and prototypes;
- Experimentation in home automation / smart buildings
- Analysis XPS, UPS and AES;
- Implementation and testing of adhesive joints;
- Development of processes for industrialization of products;
- Evaluation and monitoring of emissions / energy consumption / use of alternative energies





Upcoming Events

Following the strategy defined by the board of TEMA of deepening the dissemination of the R&D conducted by the members of the Research Unit and the cooperation between them events will occur during the next academic year, related to the Mobilizing Projects:

- **7th International Conference of TEMA**

TECHMA 2024



TEchMA2024

Date: 5th and 6th June 2024

Venue: TEMA-UA - Mechanical Engineering Department of the University of Aveiro

Organizing Committee: António Bastos, António Completo, Fernando Neto, Margarida Coelho, Paula Marques

Description: The Centre for Mechanical Technology and Automation (TEMA) of the University of Aveiro will promote the International conference “TEchMA204 – 7th International Conference on Technologies for the Wellbeing and Sustainable Manufacturing Solutions”. The purpose of this conference is to be a space for sharing scientific knowledge, seeking to strengthen contacts between researchers not only from TEMA but also from the University of Aveiro and external research entities, thus contributing to its excellence.

Website: <https://techma2024.web.ua.pt/>

Upcoming Events

- **6th International Conference on Nanomaterials Science and Mechanical Engineering (ICNMSME-2024)**

Date: 9th to 12th July 2024

Venue: TEMA-UA - Mechanical Engineering Department of the University of Aveiro

Organizing Committee: Vítor Costa, António Bastos, Paula Marques, Duncan Fagg, Igor Bdikin, Gonzalo Otero, Gil Gonçalves

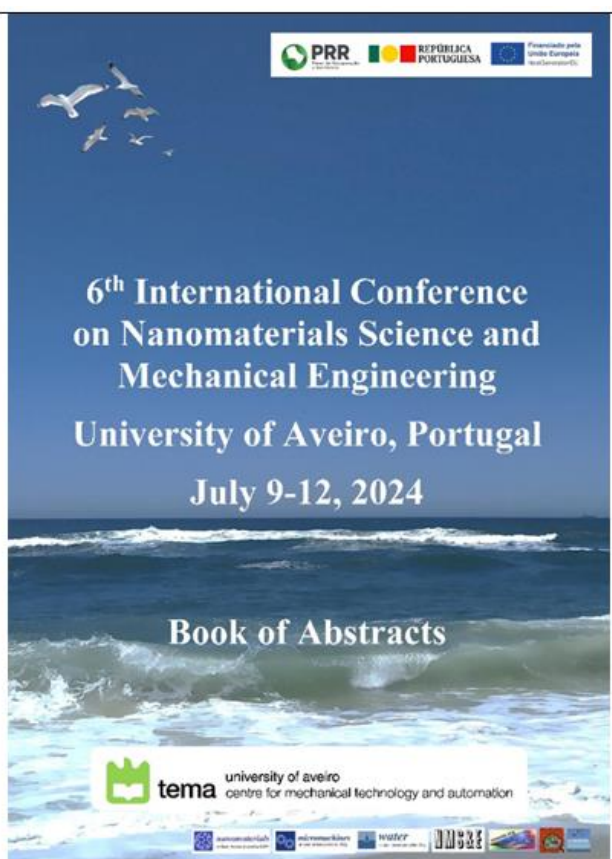
Description: **ICNMSME-2024** ICNMSME-2024 focuses on the main topics of nanomaterials science and mechanical engineering that are of interest to researchers and industry specialists, and the conference provides an opportunity for young scientists and students to present results and find their place in the world of the future. **Website:** <https://icnmsme2024.web.ua.pt/>

Additional workshops will be organized at the conference:

5th Workshop on
Characterization and Analysis
of Nanomaterials, University of
Aveiro, Portugal, July 9, 2024
(WCANM-2024)

2nd Workshop on New
Challenges of
Bionanomaterials: Science,
Technology, Application
University of Aveiro, Portugal,
July 9, 2024 (WNCBM-2024)

2nd International Workshop on
“Modern Trends in Energy
Research”, University of
Aveiro, Portugal, July 9, 2024
(IWMTER-2024)





Upcoming Events

• 2nd International Conference on Nanotechnology Research and Innovation (ICNTRI-2024)

Date: 19th to 22th November 2024

Venue: TEMA-UA - Mechanical Engineering Department of the University of Aveiro

Description: ICNTRI-2024 looks for significant Modern Problems of Nanomaterials Research and Innovation, to provide a platform to the global researchers and practitioners from both academia as well as industry to meet and share cutting-edge development in the Nanotechnology science theories, modelling, experiments, industrial implementations.

Website: <https://icntri-2024.web.ua.pt/>

Objectives
ICNTRI-2024 looks for significant Modern Problems of Nanomaterials Research and Innovation, to provide a platform to the global researchers and practitioners from both academia as well as industry to meet and share cutting-edge development in the Nanotechnology science theories, modelling, experiments, industrial implementations.

Organizing committee

Dr. Igor Bdkin, University of Aveiro, Portugal
Prof. Dr. António Manuel de Bastos Pereira, University of Aveiro, Portugal
Dr. Vikram Uttam Pandit, Haribhai V. Desai Arts, Science & Commerce College, Pune, India
Prof. Dr. Tang Chunlin, Changshu Institute of Technology, China
Dr. Alaa Almansoori, Technical Institute of Basra, Southern Technical University, Iraq
Prof. Dr. Salam J.J. Timuchi, University of the Western Cape, Cape Town, South Africa
Prof. Dr. Budhendra Kumar Singh, Central University of South Bihar, India
Prof. Dr. Aleksandr Bagmut, National Technical University "KhPI", Kharkiv, Ukraine
Prof. Dr. Gunter Suchanek, Technische Universität Dresden, Germany
Prof. Dr. Heberton Wender, Federal University of Mato Grosso do Sul, Brazil
Prof. Dr. Vítor António Ferreira da Costa, University of Aveiro, Portugal
Dr. Serbulent Turk, Sakarya University, Turkey
Dr. Alejandro Heredia Barbero, Universidad Nacional Autónoma de México, Mexico
Dr. Gal Alberto Batista Gonçalves, University of Aveiro, Portugal
Dr. Dina I. Bakranova, Kazakh-British Technical University, Kazakhstan
Prof. Dr. Maciej Wojtaś, Faculty of Chemistry, University of Wrocław, Poland
Prof. Dr. Yuri Dekhtyar, Riga Technical University, Latvia
Prof. Dr. Allison Sauter-Fourcin, University of Normandy, Rouen, France

Our previous Conferences

International Conference on Nanotechnology Research and Innovation, University of Aveiro, Portugal, November 20-24, 2023 (ICNTRI-2023)
5th International Conference on Nanomaterials Science and Mechanical Engineering, University of Aveiro, Portugal, July 5-8, 2022 (ICNMSME-2022)
4th Workshop on Characterization and Analysis of Nanomaterials, February 2-4, 2022, University of Aveiro, Portugal
4th International Conference on Nanomaterials Science and Mechanical Engineering, University of Aveiro, Portugal, July 6-9, 2021
3rd Workshop on Characterization and Analysis of Nanomaterials, February 3-5, 2021, University of Aveiro, Portugal
3rd International Conference on Nanomaterials Science and Mechanical Engineering, University of Aveiro, Portugal, July 7-10, 2020
2nd International Conference on Nanomaterials Science and Mechanical Engineering, University of Aveiro, Portugal, July 9-12, 2019
International Conference on Nanomaterials Science and Mechanical Engineering, University of Aveiro, Portugal, July 16-18, 2018

Our YouTube Channels

[Characterization and Analysis of Nanomaterials](#)
[Int. Conf. on Nanomaterials Science and Mech. Eng.](#)

Registration Fees

Non-Student Oral/Poster Presenter Registration	150 Euros
Student, PHD, PD	50 Euros
Industry, Company participant	250 Euros
Workshops	free

Supporting

We will provide financial assistance to students, doctoral students, post-doctoral researchers, young scientists for attending the conference.

More conference information:

Website: <https://icntri-2024.web.ua.pt/>
Email: TEMA-ICNTRI-2024.aveiro@ua.pt
Abstract submission: TEMA-ICNTRI-2024.abstract@ua.pt

PRR REPÚBLICA PORTUGUESA Financiada pela União Europeia (Investimentos)

**2nd International Conference
on Nanotechnology Research and
Innovation**

**November 19-22, 2024
University of Aveiro, Aveiro,
Portugal**

NoRCEL
Emergência ••• Economia ••• Estabilidade

Logos of supporting institutions: Universidade de Aveiro, dem, tema, Technische Universität Dresden, UMS-RE, and others.

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centre for mechanical
technology and automation

Title

TEMA: Centre for Mechanical Technology and Automation – the Newsletter

5th Edition – June 2024

Editors

António Bastos
António Completo
Fernando Neto
Joana Mesquita-Guimarães
Margarida Coelho
Paula Marques

Publisher

Centre for Mechanical Technology and Automation

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UIDP/00481/2020-FCT

CENTRO-01-0145-FEDER-022083



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