

# 2022 NEWSLETTER



## EDITORIAL

Welcome to the 2022 issue of CISE newsletter!

Over the course of 2022, CISE endeavoured in the realisation of activities at the scientific, technical, and public levels.

CISE organised an Open Day and promoted in-person events, improving its visibility amongst institutions from academia, energy agencies, municipalities, and other entities.

The R&D Unit internationalisation was consolidated through the participation in research projects. At the same time, significant contributions to the advancement of scientific knowledge were obtained through the publication in peer-reviewed journals.

The activity of CISE members went far beyond I&D. CISE C&B, an independent organisation, was established to promote leisure activities (such as social events and team-building activities), and to enhance visibility (namely by creating merchandising).

Enjoy your reading!

*Prof. Antonio J. Marques Cardoso*  
CISE Director



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## Open Day - Project Ef&RelDC@HomO

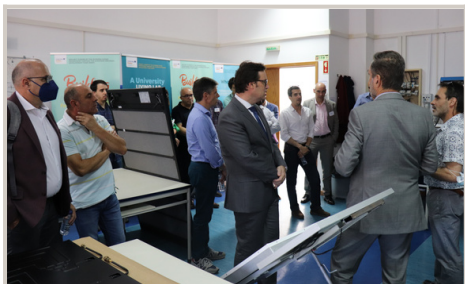
In the framework of Project Ef&RelDC@HomO - "Efficient and Reliable DC Electricity Distribution at Home and Offices", CISE organised an Open Day, on 07 July 2022, at Guarda International Research Station on Renewable Energies (CISE | GIRS-RES). The event dedicated to the presentation of the project major outputs counted with the participation, as keynote speakers, of Dr. Nelson Lage, Chairman of the Board of Directors of ADENE (National Energy Agency), and Eng. Sérgio Costa, Mayor of Guarda.



Welcome Session, from left to right: Nelson Lage, Antonio J. Marques Cardoso and Sérgio Costa.

The keynotes were followed by the presentation, by Prof. Dr. Antonio J. Marques Cardoso, Principal Investigator of Project Ef&RelDC@HomO, of its outstanding results and outputs. The presentation was followed by a visit to the indoor and outdoor facilities of CISE | GIRS-RES.

Around 40 participants, representing institutions from academia, energy agencies, municipalities, and other entities, were present in the event.







## Participation in Events

### National Meeting of Physics Students



On 25 February 2022, CISE participated in the 2022 edition of the "National Meeting of Physics Students" at University of Beira Interior (UBI), organised by **ENEF** (physics students at UBI and University of Coimbra). The event counted with the participation of 14 students and included a visit to the Laboratory of Electromechatronic Systems (CISE | LSE) and a brief presentation by CISE PhD and MSc Students of their ongoing work and research activity.



### Electrical and Computer Engineering Days

CISE participated in the IX edition of the "Electrical and Computer Engineering Days" of UBI, organised by **ELECTRUBI** (students association and representative body of the students enrolled in Electrical Engineering at UBI), on 16 and 17 November 2022. The event included a visit to the Laboratory of Electromechatronic Systems (CISE | LSE) and a brief presentation, by CISE PhD Student João Dinis.







## Visit to CISE Facilities

Aiming to promote the activities developed by the research centre among the public in general, and to attract new students and researchers, CISE has organized several visits to the centre premises:

On 23 and 30 March 2022, two classes of Mechatronics from the **Professional School of Trancoso**, visited the Guarda International Research Station on Renewable Energies (CISE | GIRS-RES). The event counted with the participation of 20 students, who were presented with a brief introduction to the work and the different research activities currently being developed there and in the various CISE facilities.



On 10 October 2022, the indoor and outdoor facilities of CISE | GIRS-RES were visited by a group of students of Civil Engineering, from the **Federal Institute of the North of Minas Gerais (IFNMG), Brazil**. The students, accompanied by two professors and the Rector of IFNMG, were presented with a brief introduction to the ongoing work and research activities at CISE | GIRS-RES.





On 24 November 2022, one class of Mechatronics from the **Professional School of Gouveia**, visited the Guarda International Research Station on Renewable Energies (CISE | GIRS-RES). The event counted with the participation of 17 students, who were presented with a brief introduction to the work and the different research activities currently being developed there and in the various CISE facilities.



On 24 November 2022, Prof. Aynur Demir, from the Department of Urbanisation and Environmental Problems of the Faculty of Economics and Administrative Sciences of the **Aksaray University, Turkey**, visited the indoor and outdoor facilities of the Guarda International Research Station on Renewable Energies.



## Internships@CISE

Continuing with the strong tradition in creating advanced training opportunities for foreign visitors from other universities and industry worldwide, CISE facilities hosted two internships, during the year of 2022. Those opportunities were definitely an interesting mean of exchange of research experiences.



**Luis Cardoso Bumba Macaia**, MSc Student

**École Polytechnique, Université de Nantes, France**

"Development of a Microcontroller for Monitoring, Management, and Control of the Renewable Energies System of CISE | GIRS-RES"

CISE | GIRS-RES

May - July 2022



**Pedro Paulo Pinheiro Moura**, MSc Student

**LaTEP - Laboratoire de Thermique, Energétique et Procédés, Université de Pau et des Pays de l'Adour, France**

"Study of a Trigeneration System based on an Adsorption Machine"

CISE | GIRS-RES

June - September 2022





## Seminars@CISE

The end of covid-related pandemic restrictions allowed CISE to continue with the implementation of its strategic plan directives in terms of seminars organization. These events, organized by PhD Students, were indeed an excellent mean to provide formal training on public presentations to students and researchers, in general, while introducing CISE members to the on-going research activities.



**Hugo Antunes**, PhD Student

*Stator Faults Detection and Severity Evaluation in a Symmetrical Six-Phase Induction Motor with Single and Dual Isolated Neutral Point*

CISE | LSE, 31 May 2022



**João Dinis**, PhD Student

*Maximizing Energy Transfer in Wireless Power Transfer Systems Using Maximum Power Point Tracking for In-Motion EV and PHEV Charging*

CISE | LSE, 14 June 2022



**Pedro Barandier**, PhD Student

*Heat Pumps Smart Asset Management Implementation Through Virtual Sensors*

CISE | LSE, 27 September 2022







**Khaled Laadjal**, PhD Researcher

*A Novel Stator Faults Indicator in Three-Phase Induction Motors, Based on Voltage and Impedance Symmetrical Components*

CISE | LSE, 12 October 2022



**Fernando Bento**, PhD Researcher

*Model-Free Predictive Control of Multilevel DC–DC Converters for Energy Storage Applications*

CISE | LSE, 12 October 2022



**Pedro Andrade**, PhD Student

*Comparative Study of Single-Switch and Double-Switch Converter Topologies, Working on Dead-Zone Mode, for Fuel Cell Applications*

CISE | LSE, 9 November 2022



**Kundakama Mpanda**, PhD Student

*Verification of Compliance with the Regulations Applicable in the Distribution of Electricity by ENDE-EP: Case of the Head Municipality of Uíge / Angola*

CISE | LSE, 16 November 2022



## Interview

Interviews (in Portuguese) by Rádio Alitude (local radio station from Guarda, Portugal) to **Dr. Nelson Lage**, Chairman of the Board of Directors of ADENE and **Prof. Antonio J. Marques Cardoso**, Principal Investigator of Project Ef&ReIDC@HomO, during the project *Open Day*, that took place at Guarda International Research Station on Renewable Energies, on 07 July 2022.

To listen to the interview, please [click here](#) (from 5:12).







## Team Building Activities

### Minas da Panasqueira

On 13 April 2022, in the scope of a Team Building activity, a group of CISE researchers carried out a technical visit to the facilities of Beralt Tin and Wolfram, Panasqueira Mines, in Barroca Grande, Covilhã. The activity was complemented by a walking trail between Barroca do Zêzere and Cabeço do Pião.



### À volta do Alva

On 22 July 2022, a group of CISE researchers carried out the 8 km walking trail “À volta do Alva”, in the scope of a Team Building activity. After the morning activity, the group enjoyed an afternoon of relaxation and recreative activities next to river Alva.







## Awards & Distinctions

### PhD Defense - Fernando Bento

13 July 2022 - CISE PhD Student **Fernando Bento** successfully defended his PhD thesis on "Fault Tolerant DC-DC Converters at Homes and Offices".

Our warmest congratulations on your successful achievement!



### PhD Defense - Carlos F. Ramos

22 September 2022 - CISE PhD Student **Carlos Figueiredo Ramos** successfully defended his PhD thesis on "Numerical and Experimental Study of a Thermo-Photovoltaic Solar Collector".

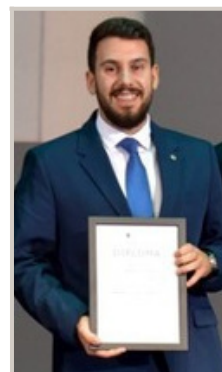
Our warmest congratulations on your successful achievement!



### Young Engineer Innovation Award 2021

CISE PhD Students **João Rodrigues** and **Balduino Mateus** were awarded the second and third prize, respectively, of the "Young Engineer Innovation Award 2021", from the Portuguese Engineers Association (Ordem dos Engenheiros).

The award ceremony took place during the celebration of the Regional Engineer's Day 2022, on 24 September 2022.



João Rodrigues



Balduino Mateus





In March 2022, the publication ***Determination of Heat Transfer Coefficient from Housing Surface of a Totally Enclosed Fan-Cooled Machine during Passive Cooling***, by Payam Shams Ghahfarokhi, Antonio J. M. Cardoso et al., in MDPI journal Machines, Vol. 9, Issue 6, Paper 120, June, 2021, was selected as an Editor's Choice Article.



In March 2022, the publication ***Fault Detection and Condition Monitoring of PMSGs in Offshore Wind Turbines***, by Nuno Freire and Antonio J. M. Cardoso, in MDPI journal Machines, Vol. 9, Issue 11, Paper 260, November, 2021, was selected as an Editor's Choice Article.



In March 2022, the publication ***Three-Phase Induction Motors Online Protection against Unbalanced Supply Voltages***, by Khaled Laadjal, Mohamed Sahraoui, Abdeldjalil Alloui and Antonio J. M. Cardoso, in MDPI journal Machines, Vol. 9, Issue 9, Paper 203, September, 2021, was selected as an Editor's Choice Article.



The paper ***Inclusive Design: Furniture Design for Autism Parents Support***, by Inês Lopes, Ernesto Filgueiras, Alexandre Guerreiro and João Monteiro, was awarded the Best Paper Award of the 11th International Conference on Design, User Experience and Usability, HCI International 2022, on 26 June 2022.

## CISE Merchandising





# HAPPY HOLIDAYS



OUR BEST WISHES FOR A  
**MERRY CHRISTMAS**  
AND A  
**NEW YEAR 2023**  
FILLED WITH HAPPINESS  
AND SUCCESS!



## Future Events

### **UNITA WEEKLY TALKS** (*January 12, 2023*):

Figueiredo Ramos will perform a virtual presentation, in the framework of the UNITA Weekly Talks. The presentation will address to the topic "Solar Technology: Photovoltaic Thermal Collectors".

### **ENERTECH SABUGAL** (*October 12-15, 2023*):

CISE will participate, as institutional partner and exhibitor, in the next edition of ENERTECH SABUGAL - Technology for Energy Fair.