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Product Development in
Civil Engineering Industries

Risk and Safety in Built and
Natural Environments

Rehabilitation of Built and
Natural Environments

Response to Natural and
Societal Changes

EDITORIAL TEAM

Inês Flores-Colen (coord.)

António Aguiar Costa

Bruna Silva

Carlos Tiago

Luís Vieira

Maria Paula Mendes

Teresa Melo

PRESIDENT'S NOTE

Former president

This edition of the CERIS newsletter intends to review the unit's activities in second semester of 2018, the year in which CERIS was evaluated by a committee appointed by FCT. It is also the last edition in which I have participated as President of the unit. I would like to express the great joy it was to participate at this level in the collective work of CERIS. CERIS is composed of a unique set of researchers in the Civil Engineering area, whose excellence is demonstrated year after year, as the statistics presented in this newsletter demonstrate. Good luck to the new Directive Board of CERIS, headed by Luís Picado Santos.



Jorge de Brito

President

Within this new stage of the CERIS' Newsletter, it is my privilege to salute you in a moment of great importance for CERIS, once it was awarded with the top classification by FCT's evaluation, being the only one with that level among the Civil Engineering research centres in Portugal. This fact is due the work of the previous Board and also many other members and collaborators, as underlined in the message of Prof. Jorge de Brito, the former President of the Board. Of course, this fact increases a lot our responsibilities, starting in 2020, but this is a very welcome problem. Within this situation, we, at the present Board of CERIS, aim to strength the centre capacity of being more effective to search and support new research and innovative opportunities, in order to continue to be the reference centre in national terms but also to seek a robust intervention in the international context.



Luís Picado Santos

SPOTLIGHT ON

Professor José Viegas

José Viegas was Secretary-general of the ITF (International Transport Forum at the OECD) between August 2012 and August 2017. At the ITF he led a program of structural reform and brought it to the forefront of innovation in transport policy, strongly increasing collaboration with both the corporate and the institutional parts of the transport sector. Some ITF reports have become worldwide references in their respective domains. Prior to joining the ITF, José Viegas was Full Professor of Transportation at the University of Lisbon, where he was national Director of the Transport Area of the MIT-Portugal program and Head of Research Unit on Transport Infrastructure, Systems and Policy. He was coordinator of more than a dozen research projects for the European Commission between 1995 and 2010, and a member of the High-Level Advisory Group on Sustainable Mobility appointed by UN Secretary-General Ban-Ki Moon, 2015-2016. He is currently a freelance consultant on Sustainable Mobility and Strategic Change, having been the Methodological Coordinator of the “Sustainable Mobility for All” project (lead organization: World Bank), and Responsible for the Strategic Framework concept of the “Transforming Urban Mobility” project at the WBCSD.



Professor João Ramôa Correia



João Ramôa Correia holds a 5-year degree in Civil (Structural) Engineering (2001), a MSc in Construction (2004) and a PhD in Civil Engineering (2008). He is Full Professor at the Civil Engineering Department of Instituto Superior Técnico (IST), University of Lisbon, where he teaches courses related with Construction Technology and Building Pathology and Rehabilitation. He coordinates a research group (CORE [\(+\)](#)) at CERIS, which conducts research, development and teaching activities on advanced fibre-reinforced polymer (FRP) composite systems for civil engineering applications. The main research areas of the CORE group are the mechanical behaviour of FRP composites systems, connection technology, long-term performance, durability, fire behaviour and sustainability. João Ramôa Correia has supervised 10 PhD theses and 82 MSc dissertations and co-authored 130 papers in SCI journals.

He has also collaborated in more than 300 advanced consultancy studies in different domains. He is leader of CEN project team WG4.T2 “FRP Structures”, which is presently developing a Technical Specification for the Design of FRP Structures. In 2012, he was the recipient of the IABSE Prize and in 2016 he received the IIFC Distinguished Young Researcher Award.

SPOTLIGHT ON

Doctor Ana Margarida Ricardo



Ana Margarida Ricardo is a post-doctoral researcher at CERIS, having completed her Ph.D. in 2013. She was asked about her future plans:

I am on a positive and challenging step of my professional life, so now I have to do my best to seize the opportunity. I am the PI of a research project and I integrate the teams of three other projects. Furthermore, my contract upgraded from a post-doc scholarship to a formal working contract.

For the next years, I aim at advancing the knowledge on the hydrodynamics of turbulent flows within vegetated regions, targeting specifically the flow-vegetation-sediments interaction. The strategy comprises the combination between fundamental and applied research and the articulation of field, laboratory and numerical work.

Out of the research life, I have been active on the promotion of scientific research in Portugal, particularly advocating recognition and improved labour conditions for researches. From the beginning, I have been participating in the “social life” or other non-research activities of CERIS and will keep doing so!

Doctor Jelena Milosevic

Jelena Milosevic Llic presented her Ph.D. thesis in May 2019. She talked about her career path:

Before I started my PhD, I was enrolled as a researcher in several projects at CERIS, where I performed experimental laboratory and in-situ tests on old masonry buildings. In the scope of my PhD thesis, I focused my research interests on the seismic vulnerability assessment of existing mixed masonry-reinforced concrete buildings in Lisbon.

At the moment, I would like to continue my Ph.D. research and develop the strengthening techniques to improve seismic resistance of old buildings. However, I am also looking forward to exploring new research paths, participating in innovative projects and developing the work even in different areas of Civil Engineering.



AWARDS

Advisory Professor

Fernando Branco received the title of **Advisory Professor** from the University of Tongji, currently leading the Shanghai Academic Ranking of World Universities in the field of Civil Engineering.



Best Paper Award

Luís Vieira, Rodrigo Gonçalves and Dinar Camotim:

2019 Vinnakota Award for best student-authored paper presented at Annual Stability Conference (+)

Paper title: *Local buckling of RHS members with small-to-large corner radii subject to combinations of axial force and biaxial bending.*



Best PhD Thesis - Honorable Mention

André Dias Martins:

2018 Best PhD Thesis in Applied and Computational Mechanics by APMTAC - Honorable Mention (+)

Thesis title: *Cold-formed steel members affected by interaction phenomena involving distortional buckling: behaviour, strength and design*

Supervisors: Prof. Dinar Camotim; Prof. Pedro Borges Dinis.

Best Paper Award

João Vieira, Nuno Almeida, Jaime Gabriel Silva, Cristina e Castro, Branca Lima, Manuela Trindade:

2018 WCEAM Best Paper Award on the topic of "Asset economics and investment decisions"

Paper title: *Using indicators to deal with uncertainty in the capital renewals planning of an industrial water supply system: testing the Infrastructure Value Index.*

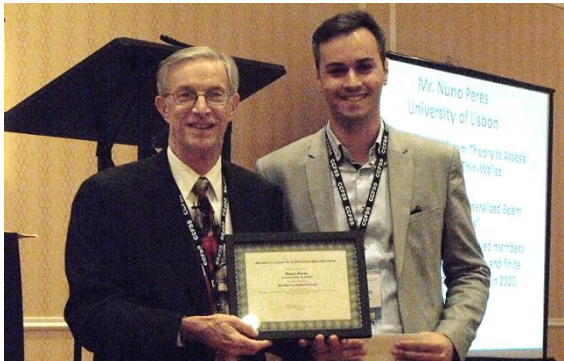


AWARDS

Outstanding Student Scholar Award

Nuno Peres:
2018 Wei-Wen Yu Outstanding Student Scholar Award

The title was awarded by the Wei-Wen Yu Centre for Cold-Formed Steel Structures (Missouri University of Science & Technology, EUA) to the PhD student Nuno Peres, supervised by Professors Rodrigo Gonçalves and Dinar Camotim.



Coordinator’s Award

The CIB has decided to award the **Dr. Wim Bakens Coordinator’s Award 2016-2019** to the Coordinators of the CIB Commission W080 - Service Life Prediction of Building Products and Components: Jorge de Brito (CERIS), Bruno Daniotti and Michael Lacasse.



Distinguished Member

Dinar Camotim was awarded the title of **Distinguished Member** by the Structural Stability Research Council (SSRC), for his “extraordinary service to the Council, attested by significant contributions to its work over a long period of time”. [\(+\)](#)



Santander/Ulisboa Scientific Award 2018

Dinar Camotim also received the ULisboa/Santander Scientific Award 2018, for his scientific, activity in the field of Civil Engineering attested by the quality and impact of the work published in internationally acclaimed high-quality journals, during the five-year period 2013-2017. [\(+\)](#)



AWARDS

Best Practice Recognition

The “**CERIS Open Day**” annual event was recognized as a **Best Practice**, under the category of *Research, Development and Innovation*, by the 4th edition of the Best Practices Observatory (ObservIST) of Técnico-Lisboa. The ObservIST is a project that stems from the action line of the institutional focus area “Processes and Quality”, as defined by the school’s Strategic Plan: “Identify, consolidate and disseminate best practices”. [\(+\)](#)



**Best Practice
Recognized**
Research,
Development
and Innovation
2019



Representing the Organizing committee of CERIS Open Day, Doctor Ana Margarida Ricardo and Professor Maria Manuela Portela participated on the 3rd ObservIST meeting that took place on the 25th June. In the meeting, the two CERIS researchers presented the CERIS Open Day event and received a certificate, handled by the IST President, Professor Arlindo Oliveira. This award and the participation on the meeting allowed us to disseminate the CERIS dynamism and to promote part of our value within Técnico community.



CERIS in the Executive Committee of IAHR Young Professionals Network

The new Executive Committee (EC) of Portugal Young Professionals Network (YPN) of the International Association for Hydro-Environmental Engineering and Research (IAHR) was elected in March 2019. The EC includes several CERIS collaborators belonging to the Hydraulics Research Group – Marta Cabral (President), João Delgado (Vice President), Catarina Jorge (Treasurer) and João Ferreira (Activities coordinator) and also members from FEUP and AdP.

This group aims at fostering the relationships between young students, researchers and professional engineers interested in sharing experiences and knowledge. This year, a set of initiatives will be held at IST, including a young professional meeting at the XVI SEREA seminar and a set of lectures, entitled “Hydro-environment Monday talks”.

Portugal YPN IAHR invites all young people from this engineering field to join this group, helping to boost its early career, by increasing the network of contacts, new skills and experiences. We welcome you in visiting our website for further information. [\(+\)](#)



President
Marta Cabral



Vice President
João Delgado



Treasurer
Catarina Jorge



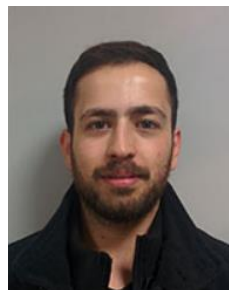
Secretary
Ana Margarida
Bento



Social secretary
Filipa Duarte



**Activities
coordinator**
João Ferreira




Advisor
Tiago Ferradosa



Advisor
Jorge Gonçalves

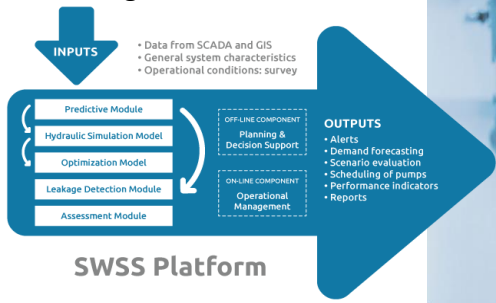
R&D PROJECTS (concluded in 2018)

<div>  <div>Hydraulics</div> </div> <div>CERIS PI</div>	
STEEP STREAMS - Solid Transport Evaluation and Efficiency in Prevention: Sustainable Techniques of Rational Engineering and Advanced Methods. Funding: FCT. Period: 2016-2018	António Heleno Cardoso
NetFluv. Research Network in Fluvial Hydraulics - Funding: FCT. Period: 2013-2018	Rui Ferreira
EsfLOWC. Efficiency and survivability of floating OWC moored to the seabed. Funding: EU COST action. Period: 2017-2018	Ricardo Canelas
Smart Water Supply System - LIFE SWSS. Funding: EU LIFE programme Period: 2015-2018	Dídia Isabel Covas

The **LIFE SWSS Project** aims at demonstrating and disseminating an innovative data management platform for enhancing decision in water supply systems. The platform collects and treats data from on-line monitoring equipment to real time information that allows for operational decisions aiming at improving energy efficiency, GHG emissions reduction and water losses minimization. It is composed of five modules: demand prediction, pump scheduling optimization, leakage detection and water and energy efficiency assessment, based on real time data and hydraulic simulation. The platform is implemented in three demonstration water supply systems managed by the largest Portuguese water company, Águas de Portugal.

Attained results are: i) the development of the innovative management and decision support platform and the demonstration of the platform capabilities for ii) near-real time leak detection, iii) improvement of energy efficiency through pump operation and KPI reporting, and iv) the demonstration of reverse pumping cost-effectiveness.

CERIS team: Dídia Covas, Laura Monteiro, João Delgado, Aisha Mamade.



R&D PROJECTS (concluded in 2018)



Environment and water resources

CERIS PI

Transnational Cooperation program - Scientific Cooperation Agreement between Portugal and Slovakia. Funding: FCT. Period: 2013-2018

Manuela Portela

IST received for the third consecutive time the support of FCT via the **Transnational Cooperation program** - Scientific Cooperation Agreement between Portugal and Slovakia (biennia 2013-14; 2016-17 and 2019-20). Despite the very small budget of the Program (ca. 2000 €/year, only covering the travel and lodging costs of one trip per year to the partners' country) and the fact that FCT gives priority to new projects and/or new teams which haven't been financed in the previous calls, the collaboration between IST and the Technical University of Košice (TUKE) has been so productive that each new application was awarded. The deliverables of the project are publications in international journals and conferences. Until now the teams published six full papers in international journals and approx. 20 communications in conferences. The research topics combined the different expertise of the teams focusing mainly on hydrological extreme events, trend analysis and risk analysis. The inclusion of young researchers in the teams is a mandatory requirement. In the case of IST each new application included two PhD students.

CERIS research team: Maria Manuela Portela, Ana Clara Barbosa, Luis Angel Espinosa.



Systems and Management

CERIS PI

GeoNetC - International MSc Educational Program in Environmental Management and Modeling. Funding: EU Erasmus+. Period: 2015-2018

Alexandre Gonçalves

Regulatory Impact Assessment (RIA): improving governance on the water and sanitation agenda. Funding: EU EM SMART2. Period: 2016-2018

Rui Cunha Marques

ROSEnet. Reducing Old-Age Social Exclusion: Collaborations in Research and Policy- COST ACTION CA - 15122. Funding: EU Cost Action. Period: 2015-2018

Rui Cunha Marques

R&D PROJECTS (concluded in 2018)



Transportation systems

CERIS PI

BRT - Center of Excellence BRT-ALC Bus Rapid Transit-Across Latitudes and Cultures. Funding: VREF Volvo Research and Education Foundation. Period: 2010-2018 Rosário Macário

Smart City Sense. Funding: Program PT2020. Period: 2016-2018 Rosário Macário

SPC Depot - Development of an innovative modular information system for container depots management. Funding: Programa PT2020. Period: 2016-2018 Rosário Macário

COST ACTION TU - 1305 Social Networks and Travel Behavior. Funding: EU Cost Action. Period: 2014-2018 João Abreu e Silva

SusCity - Urban data driven models for creative and resourceful urban transitions. Funding: FCT/MIT-Portugal Program. Period: 2015-2018 Rosário Macário

SusCity - Urban data-driven models for creative and resourceful urban transitions (MITP-TB/C S/0026/2013) was a three years project (2015 to 2018) coordinated by the INESC Porto/FE/UP with the objective of catalyse the generation and proliferation of scalable urban interventions through the development and deployment of a multi-dimensional Urban systems Simulator and Dashboard (USD). During the project, CERIS was the leader of WP4 – Urban Mobility Models having been responsible for the development of an integrated land use and transport model that enable the assessment of urban mobility innovations.



Structures and geotechnics

CERIS PI

AerialCrackView- Crack Monitoring in Concrete Bridges through Multi-Spectral Image Processing Acquired by Unmanned Aerial Vehicles. Funding: FCT. Period: 2016-2018 Eduardo Júlio

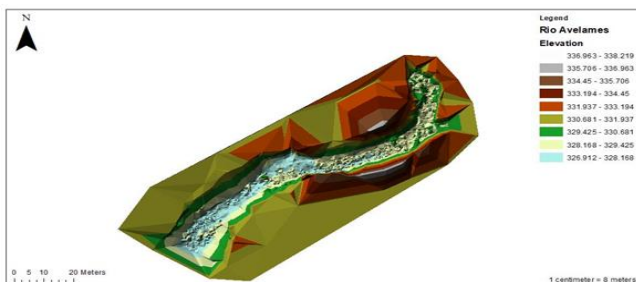
SEED PROJECTS

Research Projects supported by CERIS in the 2018th edition (concluded)

EcoPEAK (PI: Isabel Boavida)

Hydraulics +
Environment and Water Resources +
Systems and Management

The EcoPeak project investigates the effects of daily and sub-daily flow-fluctuations in discharge and water level from hydroelectric energy production in cyprinid species and in their spawning grounds. The project, which benefited from the collaboration of Hidroerg company, included field data collection, hydrological assessment, 2D numerical modelling and spatial analysis (GIS) to assess and understand fish movements under hydropeaking conditions downstream the Bragado hydropower plant (HPP) due to energy production. The master student from Civil Engineering, Filipa Ambrósio, is now finishing her thesis supported by the EcoProject. Preliminary results indicate that fish tend to swim upstream the tailrace channel when the turbines start operating to avoid the flow increase. Despite the harsh environment, fish tend to display strong site fidelity and reluctance in abandon non suitable habitats. During the development of this research new questions arisen, as how to identify the hydrologic parameters that characterize the hydropeaking in Mediterranean rivers. Therefore, a new Master thesis will be soon launched with the support from EDP.



CO₂CONCAP (PI: Rita Nogueira)

Studies on Construction +
Hydraulics +
Structures and Geotechnics

The aim of this project is to improve the CO₂ capture by concrete and other cementitious materials in order to reduce the environmental impact of building industry. This work has attracted interest from the international scientific community, namely from researchers from KU Leuven, Belgium, working on early-age carbonation of cementitious materials, with whom a collaboration is planned. The CERIS team was also invited to integrate an international team, gathering partners from Poland, Spain and Italy, working on diverse fields related to CO₂ storage and utilization (liquid fuels, polymeric materials and concrete). A common proposal was prepared and submitted for international funding.

Finally, the research fellow supported by the CERIS grant proceeded in this research field as a PhD student.



SEED PROJECTS

Research Projects supported by CERIS in the 2019th edition

ENSURE (PI: Laura Monteiro)

Hydraulics + Environment and Water Resources + Systems and Management + Studies on Construction

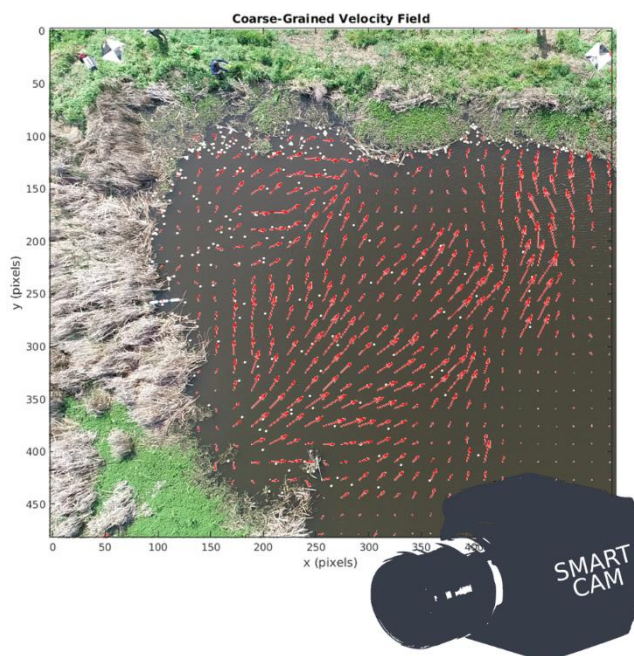
ENSURE aims at the development of an innovative methodology to assess the feasibility of safe wastewater reuse projects for landscape irrigation in urban areas. The methodology will enable the prioritization of alternative designs for reclaimed water supply systems, based on a multidimensional analysis, comprising risk for public health and the environment as well as associated costs.



SMARTCAM (PI: Moisés de Brito)

Hydraulics + Studies on Construction + Structures and Geotechnics

The aim of this project is to develop a portable intelligent imaging system for phenomena involved in natural and built environment risks. This system includes an innovative image processing software to support Particle Image Velocimetry (PIV) and Digital Image Correlation (DICT) applications. The solution will empower researchers at CERIS with modern tools that can be used both in the field as well as in the laboratory.



TECHNICAL AND SCIENTIFIC COLLABORATIONS (concluded)

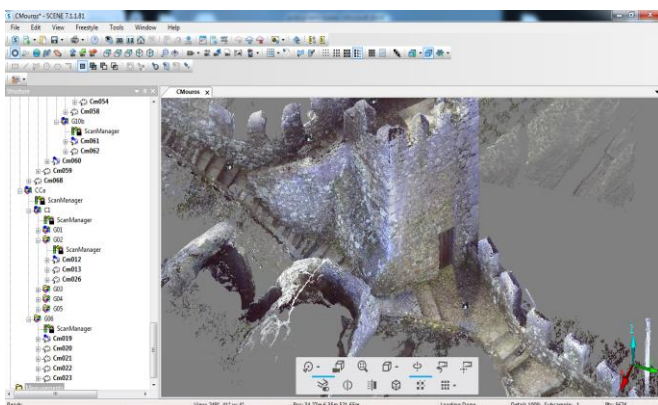
Parques de Sintra - Monte da Lua

Automatic non-contact 3D surveys applied to the inspection of pathologies in patrimony

CERIS PI: Ana Tomé

Duration: 12 months (start: January 2018)

A methodology for the identification of pathologies was developed using automatic 3D surveys without contact, designed to support the future rehabilitation of the Castelo dos Mouros east wall (Sintra). The combination of laser scanning and photogrammetry technologies allowed to overcome the difficulties of access and to record - with a high degree of detail - the geometry of wall panels in 3D models constituted by clouds of high density points



Saint-Gobain Weber Project

Development of a thermal insulating mortar and characterization of the environmental performance of construction products

CERIS PI: Inês Flores-Colen

CERIS research team: José Silvestre, Marco Pedroso, Maria da Glória Gomes, Jorge de Brito

Duration: 30 months (start: March 2016)

This project aimed to develop a sustainable and energy-efficient multifunctional external wall solution. The final output was an innovative wall solution, characterized by a low thermal transmittance coefficient aligned with the new thermal legal requirements. CERIS has contributed to the development of a new super insulating aerogel-based render with a thermal conductivity coefficient of 0.028 W/mK and to the Life Cycle Assessment of the wall solution. [\(+\)](#)



EVENTS

1st CERIS Session: rocking (pre)conceptions

The first edition of CERIS lunch events took place on the 28th May, with special guest Eng. Stephen Morais, from Indico Capital Partners, discussing the role of a venture capital firm. Specially guided towards PhD candidates in the final stages of their training, recently graduated PhD holders and those interested in the launching of a product into the global market, it also allowed time for networking over lunch and promoting interaction within the CERIS community. There were 35 attendants.



SEMINARS

Seminar on concrete eco-efficiency

Research on material properties, structural behaviour and LCA tools for eco-efficient concrete was presented on February 21st at Instituto Superior Técnico. [\(+\)](#)



ABAQUS Quick-Start workshop

A workshop on ABAQUS software initiation was held on March 22nd at Instituto Superior Técnico. The CERIS collaborators André Biscaya and André Quinhones were the lecturers. [\(+\)](#)

Seminar SMARTnet

A seminar on Seismic Methodologies for Applied Research and Testing of Non-Engineered Techniques, hosted by Martijn Schildkamp (from Smart Shelter Research), was held on May 15th. [\(+\)](#)

Debate on Water Governance

Water Governance: what do we mean, and what do we want? Current challenges in Portugal, Europe and in other regions of the world, was presented on May 24th by the CERIS collaborator Susana Neto. [\(+\)](#)

CERIS PRESENTATIONS

Erasmus + HiTimber Workshop

Between the 25th of March and the 5th of April the Instituto Superior Técnico, Universidade de Lisboa received students and professors from Estonia, Denmark, United Kingdom, Canada, Poland, Portugal and Lithuania, to participate in the HiTimber workshop “Sustainable high-rise buildings designed and constructed in timber”. The CERIS members, Miguel Amado, Luís Guerreiro and José Silvestre participated in the workshop’s organization and lectures. [\(+\)](#)

CERIS was represented in the open session by the Vice-President Professor Rui Ferreira.

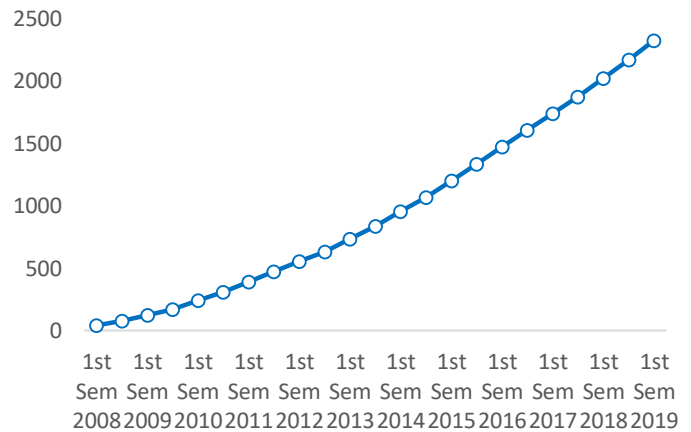


JOBE in ISIE database

The Journal of Building Engineering (JOBE), whose Editor-in-Chief is the CERIS member Jorge de Brito, was included in the ISIE database, with an Impact Factor for 2018, of 2.378. [\(+\)](#)

STATISTICS

Papers indexed to WoS / Scopus



UPCOMING EVENTS

EcoCoRe Summer School

Interaction and discussion of future research developments between PhD students, University of Minho, 6th September. [\(+\)](#)

5th INFRARISK Summer School

Students presentation about their on-going research. University of Minho, Guimarães, 15th July. [\(+\)](#)

And ...

CERIS OPEN DAY

9th and 10th October 2019

FOZ DO ARELHO

Don't miss the opportunity to get along with CERIS community outside workplace!