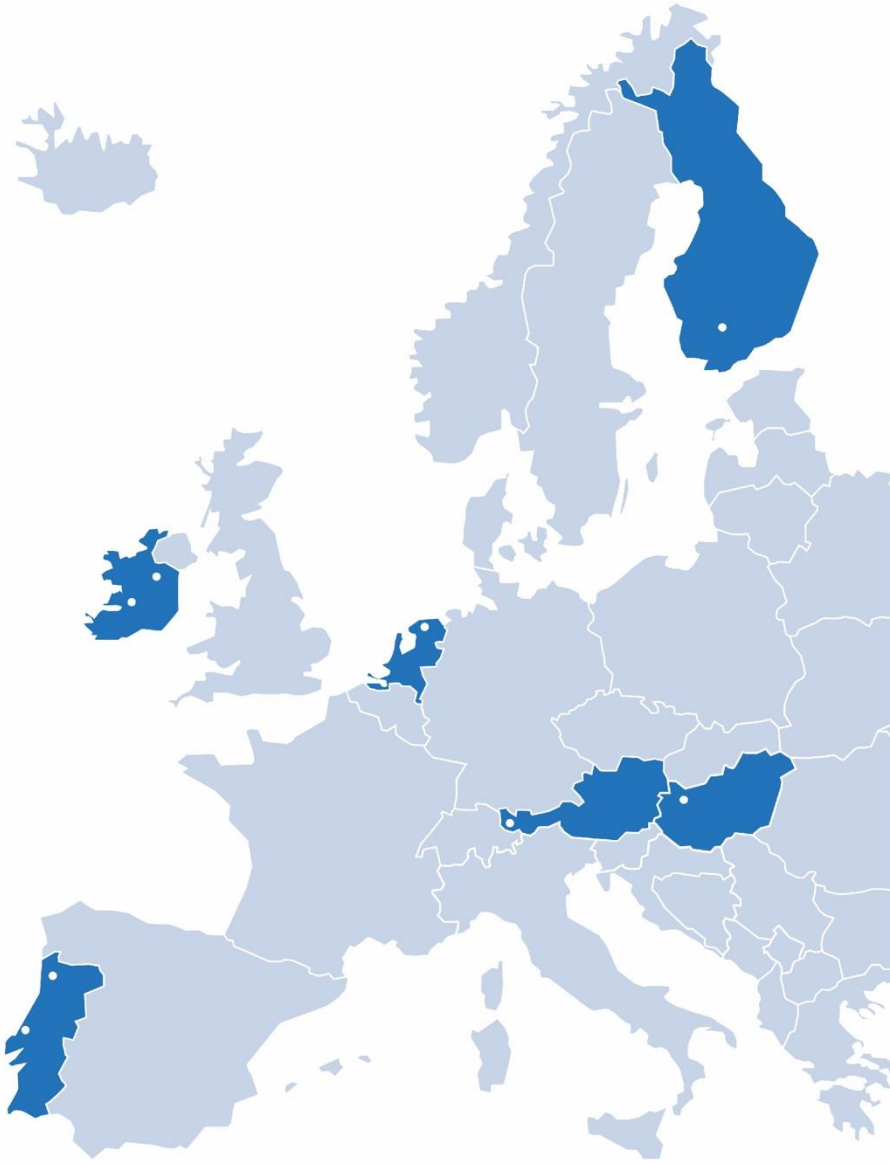
REGIONAL UNIVERSITY NETWORK PLUS

EUROPEAN UNIVERSITY



D7.10 ICARUS 2022

Annual International Conference on Applied Research with Business and Society

December 2022

Technological University of the Shannon, Ireland

Horizon 2020
European Union Funding
for Research & Innovation

Grant Agreement Number: 101035816.

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1. Conference Overview

Hosted by the Technological University of the Shannon: Midlands Midwest (TUS), Ireland, the RUN-EU PLUS Annual International Conference on Applied Research with Business and Society (ICARUS) was held online on 14 December 2022 (10h00-15h00 CET). There were 292 Eventbrite registrations for the conference and 188 attendees at the event. This was the second of the annual RUN-EU PLUS ICARUS conference since the project was launched on 5 November 2021, at the RUN-EU General Assembly in Ireland. The annual ICARUS conference engages research students, scholars, researchers, and business and society stakeholders in discussions concerning the development of practice-based research degree programmes, open science practice and researcher career development across the Regional University Network – European University (RUN-EU). Conference attendees from the 7 RUN-EU partner HEIs were joined by colleagues from the University of Burgos and Howest University of Applied Sciences, Belgium as well as be associated partners of RUN-EU who are our regional stakeholders.

The 'PLUS' of RUN-EU PLUS stands for 'Professional Research Programmes for Business and Society', which is based on the project vision of adapting the RUN-EU research outcomes to regional labour markets and societal demands, with measurable downstream societal benefits that will lead to the transformation of the European regions. Its three tracks are linked to the focus areas of the alliance and its future European Innovation Hubs (Future Industry and Sustainable Regional Development; Bioeconomy; and Social Innovation).

The RUN-EU PLUS project recognises the significance of its human capital and will support RUN-EU researchers and supervisors through the design and implementation of a common Researcher Career Framework Programme, a Research Career Development Evaluation System, a Research Skills Training Programme, a Cloud of Knowledge Portal, and an Open Science Skills Training Programme to support and reward research excellence at all researcher career development stages.

The RUN-EU PLUS project will build on the ambitious RUN-EU Discovery Programme and develop an integrated, long-term strategy for research and innovation within our European University. It will create a collaborative action plan focused on strengthening academic-business partnerships in research and innovation.

The annual ICARUS conference:

- provides a space for the presentation of the most relevant scientific results in the focus areas, including special tracks for students of professional research programmes.
- contributes to the open science agenda through close contact and informal discussion with business and society actors, in which the conclusions of the

scientific world are presented in a clear way, which is accessible to the public, and particularly to business and society representatives.

- increases the cooperation and identify possible practical problems to be addressed by research students within the professional practice-based research degrees.
- implements annual innovation awards to recognise the companies or society actors that have a special contribution to the development of joint programmes, professional research activities and the development of the Research & Innovation ecosystem in the regions of the RUN-EU PLUS alliance.
- disseminates the impact of the professional research programmes in the companies and society, notably those that host the professional practice-based research degrees.

This ICARUS 2 conference showcased the important achievements of the RUN-EU PLUS project and provided attendees with insight into the project impact to date, which includes:

- The design of frameworks which support the development of practice-based master's and doctoral programmes with joint supervision between RUN-EU partner organisations.
- The development of a Cloud of Knowledge Portal which is a repository for researcher training material.
- The development of a Researcher Career Evaluation System and a Research and Career Evaluation Tool to support researchers in the identification of their skills training needs in accordance with their preferred career path.
- The development and implementation of a Researcher Career Development Training Programme.
- The mainstreaming of Open Science practices and its relevance to business and society.
- The mobility of researchers and supervisors within the RUN-EU innovation ecosystem.

2. Branding

2.1 ICARUS 2022 Conference Banner

Image 1- RUN-EU PLUS Annual International Conference on Applied Research with Business and Society

2022 Conference Banner

3. Conference Agenda

ICARUS 2 On-line Conference

14 December 2022

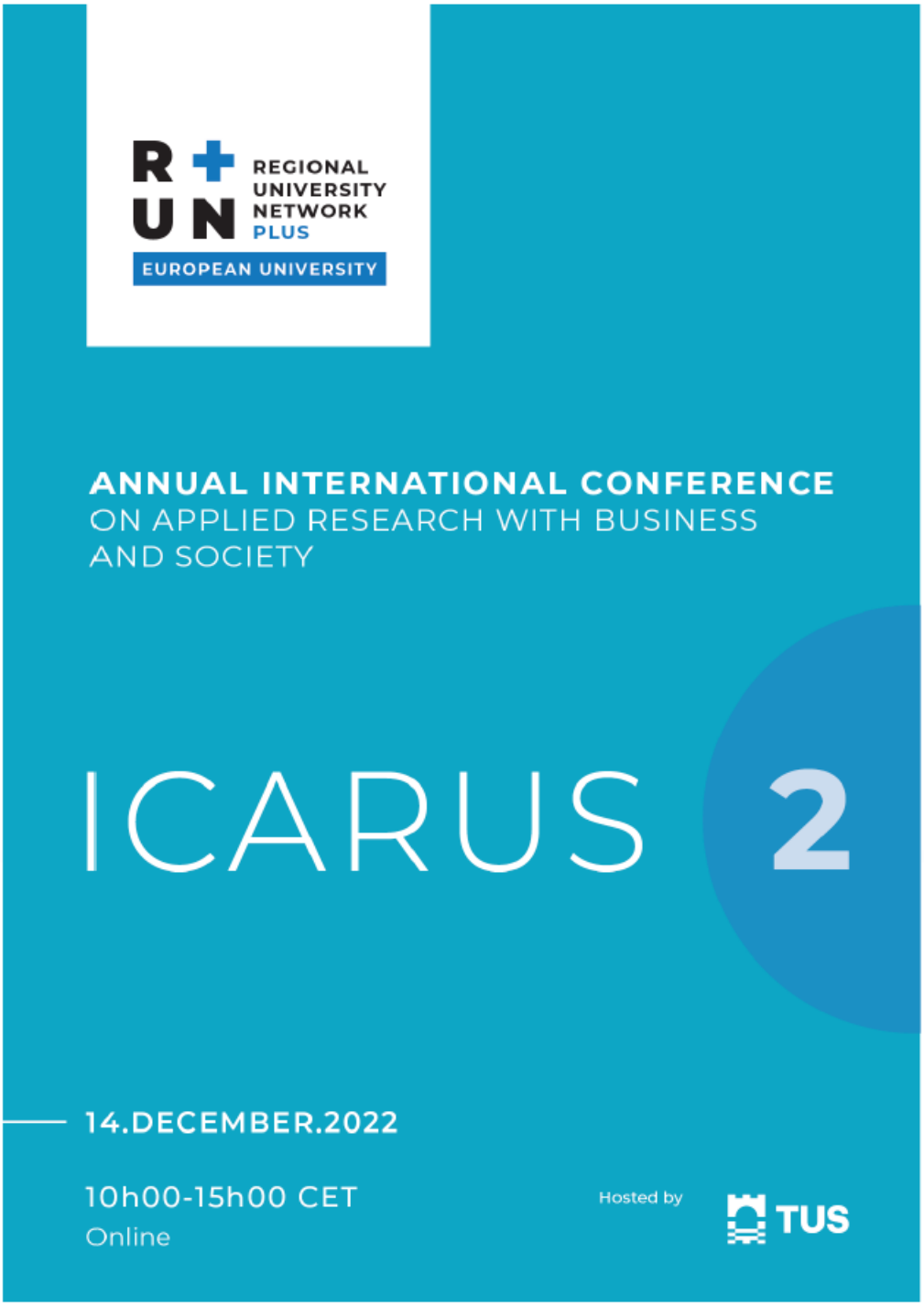
Central European Time (CET) 10.00-15.00

10.00-10.10	**Conference Opening TUS** *Prof. Vincent Cunnane, President of the Technological University of the Shannon (TUS) Ireland, Co-Director of RUN-EU* **Chair:** Dr. Siobhan Moane, RUN-EU PLUS Project Manager, TUS, Ireland
10.10-10.30	**Co-Design of a Sustainable Tourism Research Strategy for RUN-EU Regional Social Impact and Innovation** Dr. Anthony Johnston, Director of Research Development in Tourism, TUS, Ireland
10.30-10.45	**RUN-EU Researcher Mobility – The Researcher Experience** Dr. Erika Geser-Engleitner, Social Sciences Research Group, FHV, Austria (home) and TUS, Ireland (host)
10.45 – 11.00	**RUN-EU Researcher Mobility – The Researcher Experience** Dr. Edit Süle, Marketing and Management, SZE, Hungary (home) and NHL Stenden, Netherlands (host)
11.00-11.15	**Break**
11.15-11.35	**RUN-EU PhD Programme in Sustainable Polymer Technologies** Dr. Michael Nugent, Lecturer in Polymer Technology, TUS, Ireland
11.35-11.55	**Professional Practice-based Research towards the Digitalisation of Manufacturing** Patrick Ruane, Special Projects Director, Johnson and Johnson Vision Care, Limerick, Ireland
11.55-12.15	**Joint PhD Supervision across the RUN-EU Alliance – Case Study 1** Dr. Paul Archbold, Director of Sustainable Infrastructure Research Group, TUS, Ireland and Arpan Joshi, postgraduate student, TUS & IPL, Portugal

12.15-12.30	**Joint PhD Supervision across the RUN-EU Alliance – Case Study 2** Dr. João Vilaça, Head of Research, IPCA, Portugal
12.30-12.45	**How Engagement with RUN-EU can support Business Development** Dr. Norbert Kovacs, Head of the Smart Project Consulting Ltd, Hungary
12.45-13.30	**Lunch**
13.30-13.50	**RUN-EU Transfer Pathways to PhD – pre-consultation process with SZE doctoral programme explained** Frank Doyle, Programme Director, Master's of Engineering in Digitalisation of Manufacturing, TUS, Ireland
13.50-14.10	**The Application and Accessibility of Open Science to Business and Society** Ms. Tania Marsh, Research Integration Project Manager, TUS, Ireland
14.10-14.30	**RUN-EU PLUS Researcher Career Development Programme** Dr. Virve Kallioniemi-Chambers, Education Development Specialist, HAMK, Finland
14.30-14.50	**Open Forum Discussion – How do academia and business/societal organisations find each other and create meaningful engagement opportunities?** Dr. Markus Preißinger, Head of Research, FHV, Austria
14.50-15.00	**Introduction to the RUN-EU PLUS Cloud of Knowledge Portal** Dr. João Vilaça, Head of Research, IPCA, Portugal
15.00	**Conference Ends**

Registration: RUN-EU PLUS ICARUS 2 Conference - Tickets, Wednesday 14 Dec 2022 at 10:00 | Eventbrite

4. Conference Book



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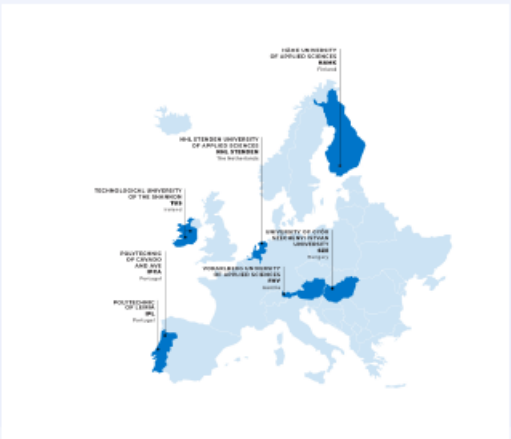

Foreword

Prof. Vincent Cunnane, President of the Technological University of the Shannon (TUS) Ireland, Co-Director of RUN-EU

The education landscape across Europe is changing. Strengthening strategic partnerships across the EU between higher education institutions and encouraging the emergence of 'European Universities' is one of the flagship initiatives of the EU's ambitions to build a European Education Area. The European Universities Initiative envisaging Europe as a global hub is a critical project to the European Higher Education Area (EHEA) and the Bologna Process, to create an EHEA based on international co-operation and academic exchange.

The Regional University Network-European University (RUN-EU) alliance brings together seven like-minded, regionally focused Higher Education Institutions (HEIs) comprising more than 76,000 students, 8000 staff, 53 faculties, 97 research centres and groups and more than 40 associated partners including Regional, National, and International authorities. The RUN-EU mission places innovative teaching, learning, research, and engagement at the centre of the alliance activities and plots a course to implement the shared, integrated, and long-term joint strategy of the European Universities. RUN-EU is transformative for our students and our regions. The RUN-EU alliance contributes to the European Higher Education Area goals of enhanced mobility opportunities and recognition of qualifications across the EU through design and delivery of Collaborative European Degrees, inclusion of all in educational opportunities and the promotion of a strong sense of European identity, culture, and citizenship. RUN-EU brings together a new generation of creative Europeans whereby 'learning, studying and undertaking research' enables our students to cooperate across borders, languages, and disciplines, and thus develop a strong European identity. RUN-EU will deliver on the core objectives of the European Research Area by 'fostering the free movement of researchers, scientific knowledge and innovation, and encouraging a more competitive European industry'.

We cannot underestimate the power of our new Regional European Network alliance and its potential for our regions that we all serve as Higher Education Institutes so well, continue to serve and will serve into a very bright future. We already know the RUN-EU community has a shared ethos, value system and commitment to region, that is only strengthened by our alliance. We as places of education and research have evolved in response to the needs of our students, our fellow citizens, and our environment.

Drawing on our past experiences – our future continues to be in responding to the needs of our regions, while moving beyond borders to learn, teach, and research together, bringing our unique skills, perspectives and learning to the RUN-EU community of Universities.

Through this process we have moved from the fringes of Europe to become central to what is happening in Europe, central to a new era in education and part of broader research collaborations.

And all the while we retain our common goals to positively impact our regions, to ensure access to higher education for the most marginalised, and to work closely with business and industry to meet the needs of the local economy.

RUN-EU Universities are also strong supporters of entrepreneurship in our regions - through education, incubation centres and business support.

The RUN-EU PLUS initiative plays a crucially important role in driving the research and innovation of our RUN-EU agenda and in educating researchers with the future skills required by our regional partners for their long-term strategic development. RUN-EU PLUS will enhance RUN-EU collaboration with and for society through the development and deployment of collaborative professional practice-based research degrees across the alliance.

Dr. Liam Brown
Vice President Research, Development, and Innovation,
TUS: Midlands Midwest,

Dr. Patrick Murray,
Head of Research and Technology Transfer,
TUS: Midlands Midwest

Dr Siobhan Moane
RUN_EU PLUS Project Manager, TUS Ireland

ICARUS 2022 is the second annual International Conference on Applied Research with Business and Society of our RUN-EU PLUS project and is hosted by the Technological University of the Shannon: Midlands Midwest. The inaugural conference was held in December 2021 when the RUN-EU PLUS project was just over 2 months old. This year's conference showcases researcher mobility and research collaborations across the RUN European University network and with our regional partners in their strategic priority research areas of sustainability, digitalisation, and social innovation.

The Horizon 2020 RUN-EU PLUS project (grant agreement 101035816) supports our RUN European University in its regional development goals by focusing on the strengthening of regional business and society partnerships in research and innovation across our RUN network. RUN-EU PLUS is developing professional practice-based research master's and doctoral programmes for business and society which will complement the existing RUN-EU strategic vision for teaching, learning, research, and engagement activities thereby delivering institutional and societal transformation in our regions. In addition to delivering a common research and innovation agenda, RUN-EU PLUS is mainstreaming open science skills and practices among our research community and has developed a Researcher Career Development Programme and a Research Career Evaluation system to support RUN-EU researchers in identifying clear personal career paths which will encourage inter-sectoral and international mobility during their careers. Conference participants will obtain insight into the research and innovation collaborative opportunities available through the RUN-EU PLUS project and the international mobility opportunities available to researchers. In addition, they will hear the personal experiences of researchers at all career stages including post-graduate researchers, academic research supervisors, research leaders and business partners.

We welcome you to our ICARUS 2022 conference and look forward to collaborating with you in the future.

Name

Dr. Anthony Johnston

Director of Research Development, Faculty of Business and Hospitality, Technological University of the Shannon: Midlands Midwest, Athlone Campus.

Presentation Title

Co-Design of a Sustainable Tourism Research Strategy for RUN-EU
Regional Social Impact and Innovation

Tony completed a B.A. (Hons.) in Business with Entrepreneurship in the University of Ulster (2003), an M.Litt. in Geography in the National University of Ireland, Galway (2005) and a Ph.D. in Geography in the National University of Ireland, Galway (2011).His main research interests are in tourism geographies and development, particularly how tourism interests with the United Nations Sustainable Development Goals.

Abstract

The tourism industry in Europe has been configured by crises in recent years. Covid19, war in Ukraine, climate change, and the ongoing refugee numbers across Europe, have exposed the industry to a period of rapid change. As an industry configured by Volatility, Exposure, Resilience and Adaptation, there is constant need for collaboration and interaction between academia, industry, and society.

This presentation outlines the initial steps taken to date by tourism researchers in the RUN-EU network to collaborate on digitisation, social inclusion and environmental sustainability issues. The presentation outlines the agenda, structure and outputs of a face to face meeting of tourism

Name

Prof. Dr. Erika Geser-Engleitner

Social Sciences Research Group, FHV, Austria (home)

Presentation Title.
RUN-EU Researcher Mobility – The Researcher Experience

After my studies in social and economic sciences I was managing director of the Employment Pact Vorarlberg. The Employment Pact Vorarlberg is a project that translates strategies to combat long-term unemployment into concrete employment policy measures. For 21 years I have been a university lecturer in social and economic sciences, a member of the Faculty of Social Work and Health and a member of the Social Sciences Research Group at the University of Applied Sciences Vorarlberg.

Main teaching areas are: Empirical social research, sociology, family and generations, poverty, interculturality, evaluation and impact research in the Bachelor's and Master's degree programmes in Social Work in Vorarlberg.

My research areas are: Project evaluation and impact measurement nationally and internationally, care and support system, family and generations, homelessness, poverty/wealth research, development of rural areas. In the ComEnt project (headed by Shane OSullivan TUS) I am the Austrian partner together with a colleague. I received a promotion award from the University of Linz and a science award from the Austrian Social Forum, Vienna.

Committee work: curriculum development, policy advice, media work, numerous lectures numerous lectures nationally and internationally, permanent member of the commission for awarding the title of professor of the FHV.

Abstract

RUN-EU Researcher Mobility – Researcher Experience

Facts: 4 week mobility for research staff; Host Institution: TUS Limerick; Applied Social Sciences& Technology; Dates Travelled: 10.10.2022-7.11.2022

My research interest: How do older people manage their everyday lives in rural areas in County Limerick?

Why this interest? One of the biggest challenges of the next 20-30 years in the EU will be how older people with support and care needs will manage their daily lives in rural areas. Intensive research activities are needed to meet this challenge. The topic Conditions for successful ageing, transnational care work and rural development is part of the RUN-EU research area 7.

The main outcomes of this Mobility:

- Knowledge what rural area in Limerick means and the impact it has on the lives of older people in the region;
- Acquire extensive knowledge of the Care System in Ireland and projects in this field
- Developing networks with providers of support services for older people
- Transfer of knowledge from and to TUS colleagues about social systems in Ireland and Austria and their impact.

The **quality and appropriateness** of the mobility and of the two way **transfer of knowledge** between the researcher and the host and the **quality of the supervision** and of the integration in the team/institution was very high.

The impact was not only achieved, but exceeded. My accommodation in Ballingarry made it possible to understand what rural means. Numerous field contacts with older people, social services and discussion of findings with colleagues from TUS provided a very comprehensive insight in a short period of time.

Synergies for future collaboration could be established. By integrating the researchers into the research units of the respective universities, the research units are also connected with each other, which will contribute to increased cooperation in the application and implementation of joint research projects.

Dissemination of the results: Professional knowledge gained in Ireland will be presented and discussed with local decision makers, colleagues and students in Austria/Vorarlberg.

Dr. Edit Süle

Associate Professor, System Theory Research Group, Department of Leadership and Marketing, SZE, Hungary

Presentation Title

RUN-EU Researcher Mobility – The Researcher Experience

Edit has over twenty years teaching and research experience in higher education in the field of logistics. She is the head of Supply Chain Management master program at Széchenyi University. Edit holds a PhD degree in Management and Business Administration Sciences. She has been teaching supply chain relevant courses from bachelor to doctoral level, supervising and reviewing doctoral theses. She has been working on digitalization projects of Vehicle Industry Research Center and actively leads the newly established System Theory research group. The research group operates as a Think Tank and bridges researchers from different scientific stages. As engineer and economist has taken part and managed many intralogistics and supply chain related company and research projects for long time. She is a consultant in the area of artificial intelligent based decision aid systems in procurement, intralogistics and distribution. Edit is author of two books with a proven track record in supply chain management domain. She is active member of Hungarian and international scientific and professional institutions. Edit believes in ground-breaking approaches of supply networks in research and practice through new theories, concepts, models and technologies but continuous focus on human.

Abstract

In the presentation the researcher from Széchenyi University Győr, Hungary and the RUN-EU project leader from the host institution NHL Stenden University of Applied Sciences, the Netherlands share the experience of Research Mission.

The researcher provides insight into the preparation process and the time spent by the research mobility. Former along these questions: what can be the best period for the mobility, how to find partner institution for host, how to find colleagues from the partner institution and how to build and keep contact with them before and during the stay. These questions are not as easy as they seem to be. As the research focus concerned, the researcher main field is supply chain and its coordination, modeling and optimization, she searched for research contacts in supply chain management and related domains. Hybrid reality as her research group area was the other relevant topic connected to the human-machine decision making process and cognitive biases of logistics decisions the researcher wanted to find similar or additional approach. The researcher's main objective was to initiate a research cooperation in a mutually agreed topic and as a result disseminate the outcomes in co-authored publications in high ranked journals. At the end of the research mobility two research topics became the subject of cooperation: (i) cross country analysis of cooperation in last mile delivery sector, (ii) supply network as a complex, sustainable system. There are more experience, furthermore lesson learnt is worth to share but almost the most important is that this four week time is not as long as at the first time can be thought.

Name

Dr Michael Nugent
Lecturer in Polymer Technology, TUS Ireland, Athlone Campus

Presentation Title

RUN-EU PhD Programme in Sustainable Polymer Technologies

Dr. Michael Nugent is a lecturer in the department of Mechanical and Polymer engineering, Technology University of the Shannon (TUS). He has over 28 years of experience in material processing and material characterisation. He has previously worked in industry in both Ireland and UK with industrial experience including medical device validation and quality engineering, project management, new product and process development and polymer processing. He has led numerous industry-supported research projects. He has over 23 teaching years experience from level 6 to level 10. His research interests are in polymers, drug delivery and Nano technology. He has published 11 book chapters and over 60 peer reviewed publications, over 90 conference presentations, 2 invention disclosures, one patent application and one license to the medical device industry. He is presently a principal investigator with APT and currently the supervisor for 5 PhD projects. He is an external reviewer for a number of universities and is a consultant to the medical device industry. Orcid: https://orcid.org/0000-0002-7469-

Abstract

The aim of the RUN-EU PhD Programme in Sustainable Polymer Technologies is to help TUS to become a university of the future by strengthening strategic partnerships, promoting European values and identity, and improving the quality and competitiveness of European higher education. To achieve this, it is necessary to design and create programmes that will ensure that students become engaged in exploring, assimilating, and constructing knowledge. The pillars identified for Future Jobs Ireland 2019 are: 1. Embracing Innovation and Technological Change 2. Improving SME Productivity 3. Enhancing Skills and Developing and Attracting Talent 4. Increasing Participation in the Labour Force 5. Transitioning to a Low Carbon Economy. These pillars are relevant in an European context and cognisance is required for these pillars in any programme and in particular with sustainable polymer technologies, these requirements are to the forefront. Additionally increased demand for research personnel are expected to be across all skill levels in the next 10 years, from technicians through to PhD level research leaders. The main aim of the programme is to address the need to provide additional education/skills to the professional engineers/technologists/scientists currently seeking expertise in the polymer sphere at PhD level. This will be achieved by collaboration with industry and the academic partnerships in the RUN-EU network. The presentation will discuss the approach taken, the collaborations involved and the future plans.

Name

Patrick Ruane, Special Projects Director, Johnson and Johnson Vision Care, Limerick, Ireland

Presentation Title

Professional Practice-based Research towards the Digitalisation of Manufacturing

I have a 1st Class honours degree in Engineering and on the last year of my PhD. I am with Johnson and Johnson over 25 years. I lead the design of high volume automated contact lens manufacturing lines for both JJVC in Ireland and USA. Also have many years of experience in Engineering management, Operations, R&D and Project Management.

Abstract

Simulation and optimisation approaches have been reviewed, with the aim of using these digitalization technologies to analyse and optimise a tray loader system configuration at Johnson & Johnson Vision Care Ireland. The digital model was derived from a real-world automated manufacturing line and verified/validated against actual line performance data. The model was then integrated with two different optimisation systems namely SimWrapper and an author developed optimization engine using a popular genetic algorithm meta-heuristic approach that uses the fitness of solutions to determine whether or not to evaluate them using the digital model.

This research combined a simulation/digital model (JaamSim) with an optimization engine to provide design/manufacturing engineers a valuable digitalization template/method to optimize the design of automated equipment with the aim of improving line performance. The overall system was designed and developed to demonstrate and evaluate the use of digitalization technologies during the design stage and continuous improvement stage of automated manufacturing lines.

Name

Dr Paul Archbold. Director of Sustainable Infrastructure Research Group, TUS, Ireland and Arpan Joshi, postgraduate student, TUS & IPL, Portugal

Presentation Title
Joint PhD Supervision across the RUN-EU Alliance – Case Study 1

Arpan Joshi obtained a Masters Degree in Environmental Protection from University of Hohenheim, followed by a Masters Degree in Civil Engineering Construction from IP Leiria in 2020. Arpan is currently employed as a researcher in the Centre for Rapid and Sustainable Product Development (CDRSP) in IP Leiria, Portugal, where his work focuses on research into sustainable materials for construction 3D printing using robots " Kuka and Roboplans".

Dr. Paul Archbold is a lecturer in the Department of Civil Engineering in TUS, Ireland. He is also the Director of the Sustainable Infrastructure Research Group in TUS. Paul has extensive experience in research and has supervised masters and PhD students in the area of civil engineering.

His research specialises in structural dynamics and innovative construction materials. Specifically, his main research interests are pedestrian loading of structures, composite materials in construction and concrete technology, with a focus on alternative constituent and reinforcing materials for concrete.

Paul is e member of Technical Committees for National Standards Authority of Ireland and is currently a MC member of a new COST Action.

Abstract

Arpan Joshi is a researcher at CDRSP (Center for Rapid and Sustainable Product Development) in IP Leiria. Through RUN-EU, Arpan has been successful in securing funding for a research project, which will be carried out under joint supervision of Dr. Paul Archbold (TUS, Ireland) and Prof. Florindo Jose Mendes Gaspar of IP Leiria (Portugal). The project is entitled "Sustainability of 3D printing for building construction using innovative and ecological materials"

This presentation presents the early stages of this work, viewed through two prisms. Initially, the technical knowledge developed through the early stage research is presented by the student. This work is aimed at developing a sustainable concrete suitable for 3D printing and examines the potential for use of forest biomass as a partial cement replacement to reduce carbon emissions.

Secondly, the experiences of development and joint supervision of a research project, including remote supervision are discussed. This presentation describes the evolution of the collaborative project and relates the experience of a new supervision team.

Name

Dr. João Vilaça, Head of Research, IPCA, Portugal

Presentation Title

Joint PhD Supervision across the RUN-EU Alliance – Case Study 2

João L. Vilaça graduated in Industrial Electronics and Computers at University of Minho, Portugal in 2004. In 2008, he obtained the PhD degree in Industrial Electronics from the University of Minho, Guimarães, Portugal. From 2009, he has been at the Technology Department of the School of Technology, Polytechnic Institute of Cávado and Ave - IPCA, Portugal, where he is Associate Professor. From 2009 to 2018, he was also researcher at the ICVS/3B's Laboratory, university of Minho, Portugal. In February 2018, he joined the 2Ai as researcher, where he is currently its Director. Since 2021 he is pro-president for R&D at IPCA. João direct his daily efforts towards challenge driven research, aiming to solve practical problems faced by clinicians and surgeons in their daily practice. His research work focuses on augmenting the information at the disposal of the physician and potentiating its precision. To this end, he aims to integrate multi-modality image sources combined with machine learning methodologies and personalized models to improve clinicians' scope of the patient's anatomy, as well as providing accurate diagnosis and navigation tools. His work is focused in the areas of medical imaging processing, image tracking, deep learning, artificial intelligence and collaborative robots, with over 125 indexed papers and 10 patents in the field. He found and co-chair the IEEE conference on Series Games and Applications for Heath. More than 100 students have obtained the degree under his supervision, including PhD, master and undergraduate degrees. He has been awarded competitive funding of over €4 million as PI. In projects that he was or is involved has always favoured the development of prototypes that result in 10 patents, one spin-off company - iSurgical3D, and 2 knowledge transfer to international medical companies.

Abstract

The Applied Artificial Intelligence Laboratory - 2Ai/IPCA pursues applied research advances on artificial intelligence (AI), namely in intelligent systems, human-AI collaboration, and robotics for health. The scientific vision for this research work focusses on augmenting the knowledge, information, and interaction at the disposal of agents, robots and physicians aiming to improve medical diagnoses, improve telemedicine, assist in repetitive medical tasks and enhance smart surgical rooms with robots, natural user interfaces and augmented reality. This cross-cutting themes and multidisciplinary interface fosters the generation of value through the development of innovative products and smart services, resulting from internationally highly competitive research with strong focus on knowledge transfer. In this presentation an overview of the 2Ai R&D unit PhD projects with companies will be provided, and an insight into the new join PhD projects with TUS.

Name

Dr. Norbert Kovacs, Head of the Smart Project Consulting Ltd, Hungary

Presentation Title

How Engagement with RUN-EU can support Business Development

Norbert Kovacs Ph.D., economist, associate professor at Széchenyi István University and CFO of SPCI Ltd (spin-off company), Hungary, Győr

17 years experience in teaching, training, coaching, and in statistical modelling,

8 years of company management experience;

Author of 105 articles and 5 books.

Abstract

Product development is successful if it is possible to build a profitable business on it. We review the milestones and resource requirements of the process to clarify how effective international cooperation supports the success of the process.

Name

Frank Doyle, Programme Director, Master's of Engineering in Digitalisation of Manufacturing, TUS, Ireland

Presentation Title

RUN-EU Transfer Pathways to PhD – pre-consultation process with SZE doctoral programme

Lecturer with TUS Midwest, Senior Researcher at the IDEAM Research Institute in TUS and Co-Ordinator of the Masters in Digitalisation of Manufacturing Programme.

Lectures in the Electrical Department and Supervises Industry based Researchers at Masters level.

Works in collaboration with Industry in the plastics, medical device and precision engineering sectors in the development of sustainable energy solutions through digitalisation of equipment and processes for manufacturing.

Research work has focused on energy efficiency in manufacturing with the goal of effecting behavioural change for production optimisation and carbon reduction.

Areas of Interest: Energy Efficiency Monitoring and Control, Applied Research with Industry, Digitalisation of Manufacturing.

Abstract

My current Academic and Research experience and why this programme is a suitable opportunity

Examining the journey through the SZE doctoral programme pre-consultation process.

Preparation for the comprehensive exam, making the connection between theoretical background topics from business administration and the practice based research to be carried out.

The proposed body of work to be undertaken and plans for fulfilling the doctoral programme requirements.

Name

Ms. Tania Marsh, Research Integration Project Manager, TUS, Ireland

Presentation Title

The Application and Accessibility of Open Science to Business and

Tania Marsh is the Research Integration Project Manager, leading the integration of a Research Information Management System (RIMS) for TUS. Tania has over twenty years' experience in a range of library roles, including the role of Scholarly Communications Librarian. She has lead library engagement with research and researchers, developed training, research guides and provided individual, research group and faculty supports in academic publishing, open access, bibliometrics, alternative metrics, research impact and scholarly identity. Tania is an Open Science Ambassador for the RUN-EU+ Project, a member of the Library Association of Ireland Open Scholarship Group and an Altmetrics Ambassador

Abstract

Open Access (OA) refers to the removal of major obstacles (e.g. Article paywalls) to accessing, sharing and re-using the outputs of scholarly research. The rationale is that the research process is facilitated by ensuring rapid and widespread access to research findings. OA is more equitable compared to traditional scholarly publishing, as it allows anyone with an internet connection to access, read and build upon the most up-to-date scientific literature. It has become widely accepted in the scientific community that OA promotes knowledge and enables innovation.

Research funding comes from multiple sources, including national funding agencies and industries, as well as private funders. Much primary research takes place outside of academia, inside R&D departments; if R&D in the private sector can access more research findings, this will ultimately benefit the public interest as well. Appropriate licensing and accessibility can influence re-use through commercialisation, and can empower citizens and industry to recognize great economic benefits.

Name

Dr. Virve Kallioniemi-Chambers, Education Development Specialist, HAMK, Finland

Presentation Title

RUN-EU PLUS Researcher Career Development Programme

Dr Virve Kallioniemi-Chambers works as the Education Development Specialist in the global education team at the School of Teacher Education in Häme University of Applied Sciences in Finland. She has worked for over 20 years in various teaching, research and development tasks in the field of Higher Education. In her doctoral thesis she studied the project-based pedagogical collaboration between the traditional university, the university of applied sciences and other kinds of organisations. She has written in collaboration with other researchers' articles and reports on doctoral education and the collaboration between the academia and non-academic context. She has supervised several BA theses in education, taught Marie Curie ITN doctoral students and acted also as the supervisor for one Marie Curie ITN doctoral candidate. She has been the Project Manager in several EU funded (e.g. Horizon 2020 programmes) research projects. Both the global and European perspective on the development of university education and research practices has been at the heart of her work.

Abstract

It is acknowledged that researchers require continuous training in multiple facets of research activity including disciplinary knowledge and concepts, research methods, research ethics, Intellectual Property Rights issues, data analysis methods, digital tools, Open Science, etc. There is also evidence that the research process is becoming less linear, more collaborative and more multidisciplinary with a larger diversity of outputs (see EU report Towards a Reform of the Research Assessment, 2021). In this presentation you will hear about the Researcher Career Development Programme that is available to all RUN-EU researchers and is designed to allow participation at any stage during career development. The Programme pays attention on the researchers' career paths also outside academia, on research collaboration and on the research skills required in different research environments. The training supports researcher to plan own career path in a more systematic way whether the career orientation is focusing more on academic or non-academic environment. On an individual level, the training programme acts as one step in a researcher's own educational and learning journey. In this presentation there will be given also some examples of the implemented RUN-EU PLUS workshops and the feedback gathered from them.

Name

Dr. Markus Preißinger, Head of Research, FHV, Austria

Presentation Title

Open Forum Discussion – How do academia and business/societal organisations

Markus is head of research at FHV – Vorarlberg University of Applied Sciences. He is also head of the research center energy at FHV and leader of the Josef Ressel Centre for Intelligent Thermal Energy System. His background is a classical engineering study course (diploma) with a PhD in thermal energy systems . Markus holds the illwerke vkw Endowed Professorship for Energy Efficiency.

Abstract

The short impulse should give an answer on the question, how academia and business/societal organisations find each other and create meaningful engagement opportunities. The presenter will present two challenges from his research career to open the discussion to anyone

Name

Dr. João Vilaça, Head of Research, IPCA, Portugal

Presentation Title

Introduction to the RUN-EU PLUS Cloud of Knowledge Portal

João L. Vilaça graduated in Industrial Electronics and Computers at University of Minho, Portugal in 2004. In 2008, he obtained the PhD degree in Industrial Electronics from the University of Minho, Guimarães, Portugal. From 2009, he has been at the Technology Department of the School of Technology, Polytechnic Institute of Cávado and Ave - IPCA, Portugal, where he is Associate Professor. From 2009 to 2018, he was also researcher at the ICVS/3B's Laboratory, university of Minho, Portugal. In February 2018, he joined the 2Ai as researcher, where he is currently its Director. Since 2021 he is pro-president for R&D at IPCA. João direct his daily efforts towards challenge driven research, aiming to solve practical problems faced by clinicians and surgeons in their daily practice. His research work focuses on augmenting the information at the disposal of the physician and potentiating its precision. To this end, he aims to integrate multi-modality image sources combined with machine learning methodologies and personalized models to improve clinicians' scope of the patient's anatomy, as well as providing accurate diagnosis and navigation tools. His work is focused in the areas of medical imaging processing, image tracking, deep learning, artificial intelligence and collaborative robots, with over 125 indexed papers and 10 patents in the field. He found and co-chair the IEEE conference on Series Games and Applications for Heath. More than 100 students have obtained the degree under his supervision, including PhD, master and undergraduate degrees. He has been awarded competitive funding of over €4 million as PI. In projects that he was or is involved has always favoured the development of prototypes that result in 10 patents, one spin-off company - iSurgical3D, and 2 knowledge transfer to international medical companies.

Abstract

A digital knowledge hub portal equipping researchers with a combination of pedagogy and research skills will be set-up. This portal will gather contributions from all the partners of the consortium. The archive portal will include different resources (texts, policy documents, informative and training materials, videos, etc) focusing on a variety of topics, namely: resilience and independent working, communication skills, networking and influencing skills, prizes and recognitions, education, areas of interest, expertise project management, personal development, strategic career planning, time management, writing and publishing skills.

Horizon 2020
European Union Funding
for Research & Innovation

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The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains. Grant Agreement Number: 101035816.

5. Conference Presentations

5.1 Dr Anthony Johnston

Director of Research Development for the Faculty of Business and Hospitality, Ireland

STRUCTURE OF TALK

- Challenges in tourism industry, policy and environment
- RUN-EU and Tourism Collaboration
- RUN-EU Plus – what are the opportunities
- Good practice in working together

www.run-eu.eu

TOURISM: AN INDUSTRY CONFIGURED BY:

SOME OF THE CURRENT CHALLENGES IN TOURISM

- Climate Change – both a driver of change and suffering from impact
- Biodiversity – both a driver of change and suffering from impact
- Production and consumption – waste, circularity, resource intensive
- Overtourism and impact on residents – many European cities and regions suffering
- Human rights, labour rights, fair pay – e.g. at mega-events such as Fifa2022 World Cup

SOME OF THE CURRENT CHALLENGES IN TOURISM

- Post COVID19 recovery – easy to close, much harder to reopen
- War in Ukraine – security landscape in Europe, mobility
- Labour costs and labour availability – increasing with inflation, availability of workforce
- Refugee crisis in Europe – 7.8 million Ukrainians dispersed in Europe in 8 months + Syria, north Africa and others over a longer period of time

WHAT ARE WE DOING SO FAR RUN EU AND RUN EU PLUS

- Co-supervision of PhD theses
- Joint degree
- Researcher and PhD student mobility visits
- Development of SAPs – Ethics and Values in Tourism and Hospitality
- Application for Erasmus KA2 (250k) and Alliance for Innovation (1m) in development
- Discovery mission to connect who we are in RUN-EU with some of these identified challenges

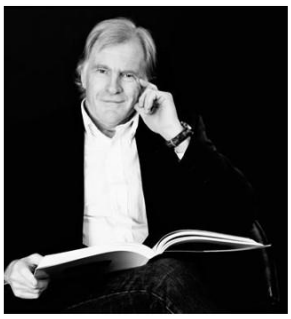
WP5 RESEARCH TOURISM DISCOVERY MEETING OCTOBER 22

- **2 days in Athlone**
- **Researchers from Athlone, Limerick, Hungary, Netherlands and Portugal**
- **PhD students**
- **Industry representative case study**
- **External experts**

www.run-eu.eu

WP5 RESEARCH TOURISM DISCOVERY MEETING OCTOBER 22

- **Presentation from Professor Terry Stevens (Visiting Professor in TUS)**
  - To inspire and encourage
- **Presentation of current Erasmus Key Action 2 partnership**
  - To illustrate structure
- **Presentation of current sample industry challenge**
  - To give an example of a real-world live project



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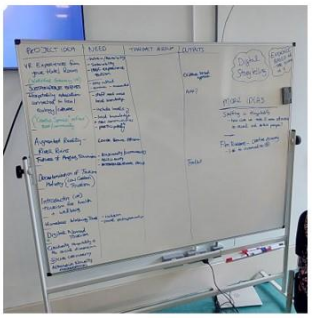
OUTCOMES

- Decision to apply for up to 4 Erasmus Key Action 2 Projects (Spring 2023)
- Work is ongoing in developing suitable projects
- Commencement of further joint PhD supervision



Key pillars of Erasmus Plus Applications

- Inclusion and Diversity
- Environmental sustainability
- Digital dimension
- Participation and civic engagement

FUNDING VALUE

- The proposed funding model consists of a menu of 3 single lump sums, corresponding to the total grant amount for the project: **120 000 EUR, 250 000 EUR and 400 000 EUR**. Applicants will choose between the 3 pre-defined amounts according to the activities they want to undertake and the results they want to achieve. Applications to be submitted March 2023.
- Ideal first step into EU funding world
- Bridges teaching – research and impact journey
- Tangible outputs to most applications

WHAT WORKED SO FAR:

First steps:

- Online meeting to plan
- In an-person meeting to build momentum
- Follow up online meetings on Zoom
- Coordination of application

NEXT STEPS

- Developing meaningful RUN-EU to industry/ policy/ federations and bridging our academia – industry/ policy research gap – PhD partnerships
- Promoting value of research to tourism industry
- Applications – at least 4 to be submitted in Spring 2023
- Continued bilateral partnerships within network
- Please contact Anthony.Johnston@tus.ie

5.2 Dr Erika Geser-Engleitner

Social Sciences Research Group, FHV, Austria (home) and TUS, Ireland (host)

FHV
Vorarlberg University
of Applied Sciences

REGIONAL UNIVERSITY NETWORK
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RUN-EU Researcher Mobility – Researcher Experience

Prof.(FH) Mag. Dr. Erika Geser-Engleitner

Facts of my RUN-EU Research Mobility

- 4 week mobility for research staff;
- Host Institution: TUS Limerick; Applied Social Sciences& Technology;
- Host: Shane OSullivan
- Dates travelled: 10.10.2022-7.11.2022

Seite 2 © FHV – Prof.(FH) Dr. Erika Geser-Engleitner; RUN-EU Researcher Mobility – Researcher Experience

My research interest

How do older people manage their everyday lives in rural areas in County Limerick?

What do they intend to do if they need support and care?

Why this interest?

- One of the biggest challenges of the next 20-30 years in the EU will be how older people with support and care needs will manage their daily lives especially in rural areas.
- Intensive research activities are needed to meet this challenge.
- The topic conditions for successful ageing, transnational care work and rural development is part of the RUN-EU research area 7.

My field access

- A cottage in Ballingarry was my accommodation
- E- bike was my means of transport
- I talked with older people in shops, on the street, in garages, in inns, in pubs...
- with social service providers;
- Research on the internet and in libraries
- Talks with colleagues from TUS

Some results

- Living in rural Limericks means being dependent on the car. Older people drive cars even though they have difficulty walking.
- They rely heavily on neighbourhood help.
- There are services such as home nursing and mobile support services. However, these are very few hours a week.
- Nursing homes are strictly rejected
- Almost all respondents hope to get help from their children, although some of them live further away
- Care workers from Eastern European countries play no role in Ireland

Some results

- The danger of loneliness and isolation were mentioned several times.
- Projects such as Mans' sheds and walking groups were visited. They are important to stay healthy and maintain social contacts.
- State support for older people in need of care differs between Austria and Ireland. State support is higher in Austria.
- In summary, I have gained a comprehensive knowledge of the lives of older people in rural Limerick.

The main outcomes of this Mobility

- Developing networks with providers of support services for older people
- Transfer of knowledge from and to TUS colleagues about social systems in Ireland and Austria and their impact.

Mary O'Doherty
Manager
085 1901899
Voluntary Housing Support Services
8 Ballycummin Village
Raheen
Limerick V94 C5K6
www.vhss.ie
Registered Charity No : 20067908

Evaluation results

- The **quality and appropriateness** of the mobility,
- the **two way transfer** of knowledge between the researcher and the host
- and the **quality of the supervision** and of the integration in the team/institution was **very high**.

Bridget Kirwan; Catherine Carty; Carole Glynn

Hi Erika,
I am happy to meet with you over the next while, from a social perspective there are initiatives in Tipperary related t eg. Mens sheds, Active retirement groups, Walking groups whose focus is keeping people engaged when they are active.

At later stages there are Day care centres whose focus is primarily on engaging older people and providing activities for them one day (or perhaps more) per week. They will usually come to a centre for these activities.

It would be good to chat and see what works best for you.

Best wishes,

Bridget

Impact

- The impact was not only achieved, but exceeded.
- Numerous field contacts with older people, social services and discussion of findings with colleagues from TUS provided a very comprehensive insight in a short period of time.

Synergies for future collaboration

- Could be established and intensified
- By integrating the researchers into the research units of the respective universities, the research units are also connected with each other, which will contribute to increased cooperation in the application and implementation of joint research projects.

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Technological University of the Shannon: Midlands Midwest
Ollscoil Teicneolaíochta na Sionainne: Lár Tíre Iarthar Láir
www.tus.ie

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FHV
Vorarlberg University of Applied Sciences

Dissemination of the results

Professional knowledge gained in Ireland will be presented and discussed with local decision makers, colleagues and students in Austria/Vorarlberg.

Quote

"Where are you from?
From Austria.
Ah, where Hitler came from."

Quote

"Oh you are brave you ride a bike!

No, I am not brave, I am a foreigner."

Quote

"Why do so many houses have a dog? Is it so dangerous here?

No, we love dog. And when you come home, someone is happy."

Thank you
for your attention

5.3 Dr Edit Süle

Marketing and Management, SZE, Hungary (home) and Agnes Brinks, RUN-EU PLUS Project Co-ordinator, NHL Stenden, Netherlands (host)

ICARUS 2

RUN-EU Research Mobility
Researcher and Host Institution Experience

Dr. Edit Süle researcher
Associate Professor
Head of Supply Chain Management MSc
Széchenyi University of Győr Hungary

Agnes Brinks MSc
RUN-EU PLUS coordinator
NHL Stenden University of Applied Sciences
Leeuwarden the Netherlands

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Széchenyi University of Győr Hungary

↓

NHL Stenden University of Applied Sciences
Leeuwarden the Netherlands

Agenda

ICARUS 2

- Subject of Research Mobility
- Preparation Process from two points of view
- Researcher experience
- Outcome of Research Mission
- Lesson learnt from the experiences and suggestions for future participants

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Subject of Research Mobility

ICARUS 2

RUN-EU Research Mission

- Duration: 4-week research mobility
- Sending Institution: Széchenyi University of Győr Hungary
- Host Institution: NHL Stenden University of Applied Sciences Leeuwarden the Netherlands
- When: November 2022
- Target of the Mobility: *International research cooperation, collaboration in joint study programs at different levels and joint supervision of doctoral students*

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Preparation process from two points of view

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Researcher Preparation Process

- Determining the targeted research and other areas for cooperation
- Selection of the targeted university
- Making contact with the host institution
- Research plan for the visit
- Arrangement of the stay

Host Institution Preparation Process

- Getting to know an application for research mobility
- Enabling connection between the researcher and the host university colleagues
- Continuous relationship
- Managing expectations

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Researcher experience

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- Initial phase of the visit
- Way of communication
- Knowing each other's research interest
- Find common areas for collaboration in research and education
- Agree in joint research and supervision of PhD students
- Working on joint research plan
- Phases completed and further steps

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Outcome of Research Mission

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- Cooperation in two research areas
  1. Analysis of cooperations in last mile delivery sector
     - Preparation of qualitative primary research in city logistics for a cross-country analysis
     - Preparation of a publication idea in a scopus indexed Q1-Q2 journal for a cross-country comparison in last mile delivery sector
  2. Supply network as a complex sustainable system (supply network in a new approach)
- Preparation of an agreement for joint supervision of doctoral students
- Mapping of the opportunity of SAP and joint/double degree in digital supply chain domain

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Lesson learnt from the experiences and suggestions for future participants

ICARUS 2

From the researcher side

- Longer time for the preparation
- Knowing the steps of the background process
- Keeping continuous communication with the host institution
- Being persistent during the preparation

From the host institution side

- Communication to internal research staff
- Making responsibilities and processes clear
- Managing expectations

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ICARUS 2

Acknowledgement: Funding is available to support the outward mobility of RUN-EU researchers and students who wish to engage in eligible research mobility activities at one of the RUN-EU higher education institutions. The purpose of the initiative is to support the creation and development of international research collaboration within the alliance. These research mobility activities are expected to support the development of new networks, facilitating knowledge transfer and the generation of novel innovative societally-impactful research project ideas, fostering interdisciplinary research and empowering the independence of our researchers and innovators. The funding by Erasmus plus (RUN-EU) and Horizon 2020 (RUN-EU PLUS) supports the joint development of research activities on different levels within the RUN-EU consortium.

ICARUS 2

Thank you for your attention!

Dr. Edit Süle
sule.edit@ga.sze.hu
Agnes Brinks MSc
agnes.brinks@nhlstenden.com

5.4 Dr Michael Nugent

Lecturer in Polymer Technology, TUS, Ireland

ICARUS 2

Michael Nugent

"RUN-EU PhD Programme in Sustainable Polymer Technologies"

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Overview

ICARUS 2

RUN-EU PhD Programme in Sustainable Polymer Technologies

- TUS vision
- Sustainable Polymer Technologies
- Irish Polymer Industry
- PhD programme
  - Ongoing research
- RUN-EU Case study collaborations

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TECHNOLOGICAL UNIVERSITY OF THE SHANNON: MIDLANDS MIDWEST (TUS: MMW)
TU VISION AND TU MISSION

ICARUS 2

The TU vision is to be a catalyst for positive change and innovation across regions. The TU goal is to become an accessible, progressive and impactful technological university – a higher education institute that reflects the educational demands and economic needs of the regions and the communities served.

TU mission The TU aspires to be a contemporary and engaged technological university distinguished by outstanding learner experience, international focus and impactful and applied research. The TU will lead continued social and economic growth for the benefit of the communities it serves. The TU will strive to be a leading provider of higher education that is student-centred, research-informed, industry-relevant, and accessible to all

TUS

Sustainable Polymer technologies

ICARUS 2

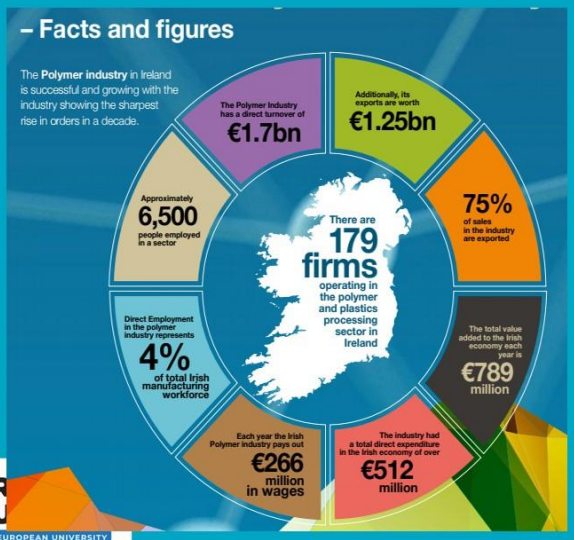
TUS

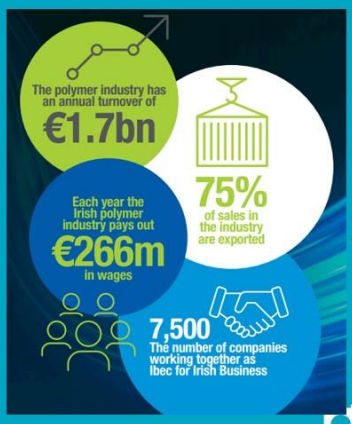
THE IRISH POLYMER INDUSTRY

ICARUS 2

– Facts and figures

The **Polymer industry** in Ireland is successful and growing with the industry showing the sharpest rise in orders in a decade.



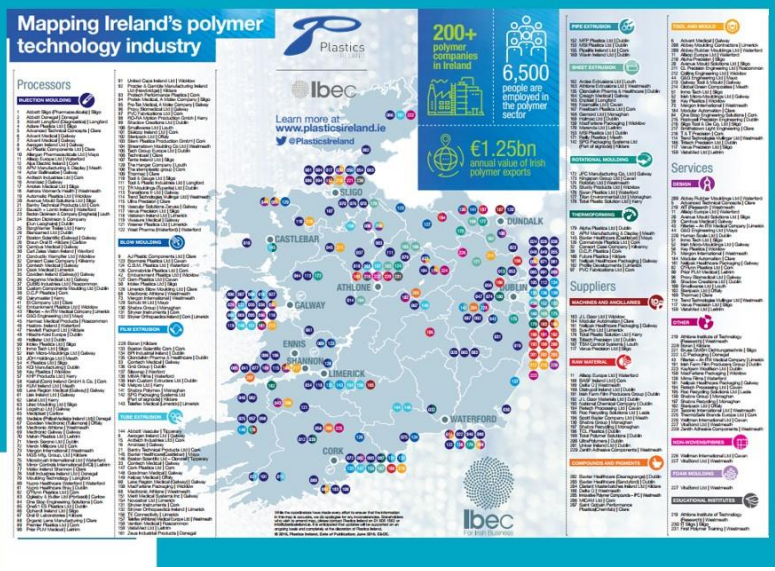


EUROPEAN UNIVERSITY

TUS

MAPPING THE IRISH POLYMER INDUSTRY

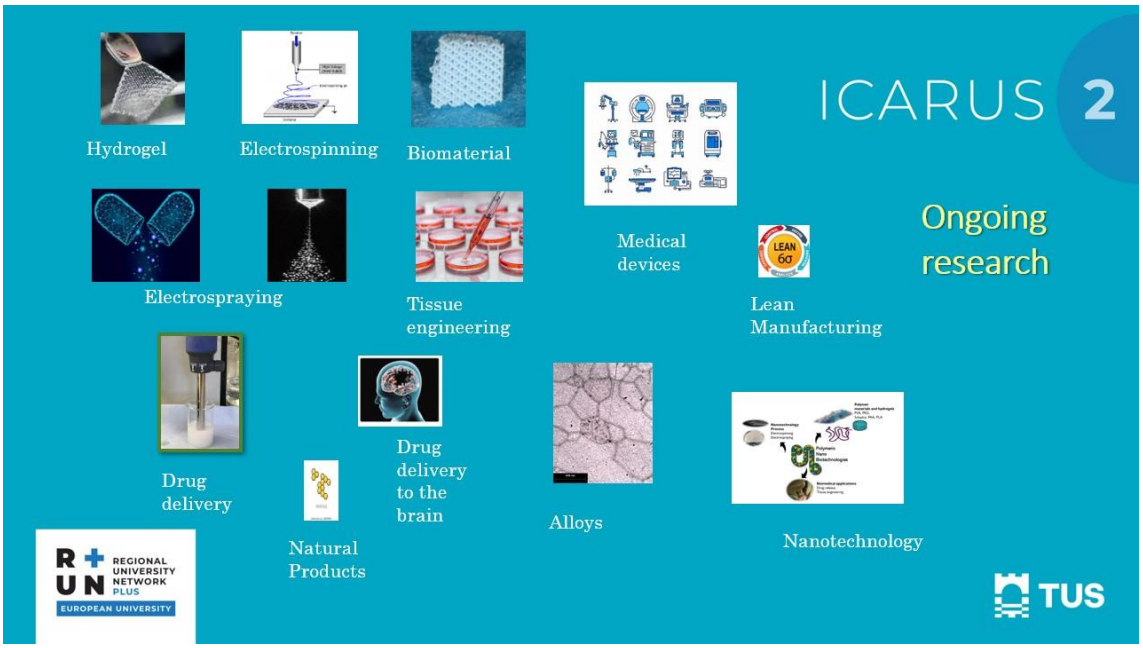
ICARUS 2



MOVING AWAY FROM LOW COST / HIGH VOLUME TO HIGH VALUE PRODUCTS →

- HIGHLY SKILLED WORKFORCE REQUIRED
- WELL PAID JOBS

TUS


ICARUS 2
Ongoing research
Hydrogel
Electrospinning
Biomaterial
Medical devices
Electrospraying
Tissue engineering
Lean Manufacturing
Drug delivery
Drug delivery to the brain
Natural Products
Alloys
Nanotechnology
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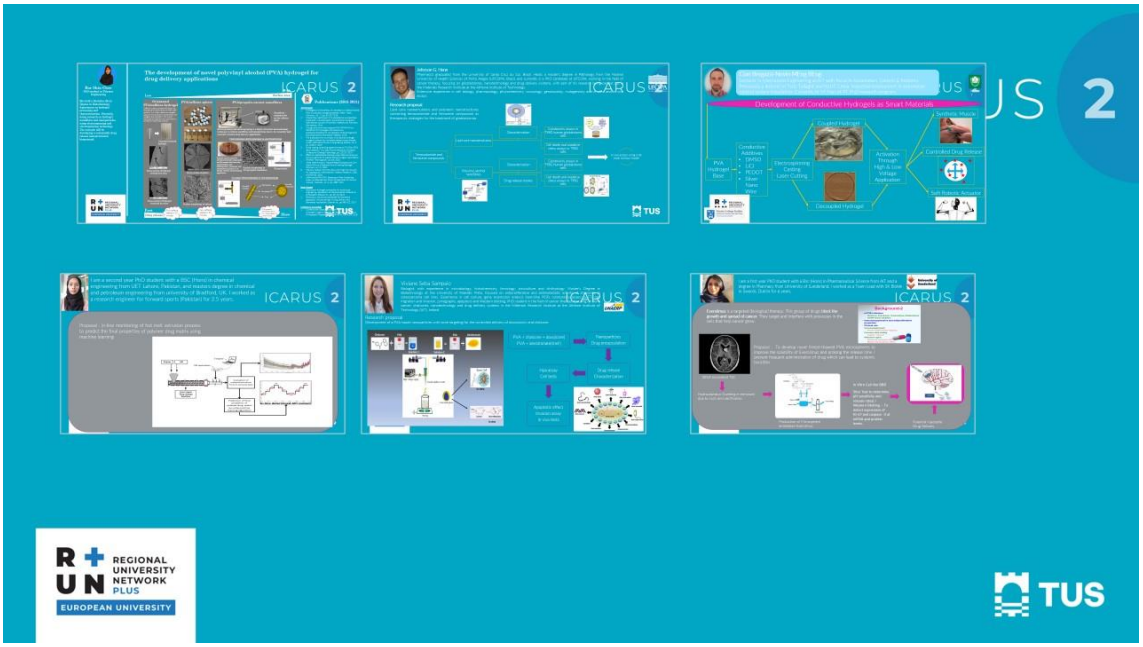
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Bor Shin Chee
PhD student in Polymer Engineering

She held a Bachelor (Hon) Degree in Biotechnology. Experiences in hydrogel processing and characterisation. Presently, doing research on hydrogel nanofibres and nanoparticles using electrospinning and electrospraying technology. The outcome will be developing a sustainable drug release nanostructured biomaterial.

The development of novel polyvinyl alcohol (PVA) hydrogel for drug delivery applications

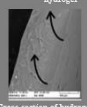
ICARUS 2

Low — Surface area — High

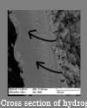
Orientated PVA/caffeine hydrogel

Caffeine is used to prepare fast dissolving drug delivery systems due to its high water-solubility. It is widely used as an analgesic adjuvant/mild stimulant in combination with analgesic (e.g. ibuprofen). This type of medicines can augment their bioavailability and deliver rapid onset of action

Uniaxial-stretched hydrogel

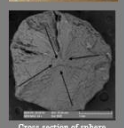


Cross section of hydrogel stretched for once

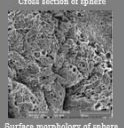


Cross section of hydrogel stretched for twice

PVA/caffeine sphere



Cross section of sphere



Surface morphology of sphere

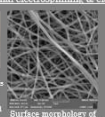
PVA/propolis extract nanofibres

Nanofibres / nanoparticles on the collector plate

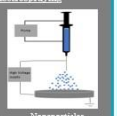
Electrospinning and electrospraying is a highly attractive nanotechnology technique to produce nanofibres and nanoparticles due to its versatility and resultant tuneable drug delivery applications

Conventional electrospinning & electrospraying

Propolis extract contains abundant phenolic compounds and flavonoids that have the antimicrobial, anti-inflammatory, anticancer and antioxidant activities. It is ideally used for wound healing application.

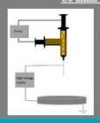


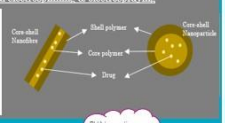
Surface morphology of PVA/propolis Nanofibres



Nanoparticles

Co-axial electrospinning & electrospraying





Fast — Drug release — Slow

Fully caffeine release in 20 minutes

Fully caffeine release in 60 minutes

PVA/propolis nanofibres held a fully drug release up to 8 hours

Publications (2018-2021)

Journal paper

1. Investigation of the effects of orientation on freeze/thawed Polyvinyl alcohol hydrogel properties, Mater. Today Commun., vol. 17, pp. 82–93, 2018.
2. Freeze-thaw electrospun PVA-dacarbazine nanoparticles: preparation, characterization and anticancer evaluation, International Journal of Polymeric Materials and Polymeric Biomaterials, 2019.
3. A tough and novel dual-response PAA/P(NIPAAM-co-PEGDMA) IPN hydrogels with ceramics by photopolymerization for consolidation of bone fragments following fracture, Biomedical Materials, 2019.
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Book Chapter

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Conference proceeding

1. Synthesis and Characterisation of [illegible] Hydrogel Cryogenic Spheres by Biomedical Applications, Orthopaedic Proceedings, Vol. 100-B, No. SUPP_24, 2018.

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Jeferson G. Henn

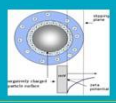
Pharmacist graduated from the University of Santa Cruz do Sul, Brazil. Holds a master's degree in Pathology from the Federal University of Health Sciences of Porto Alegre (UFCSPA), Brazil, and currently is a PhD candidate at UFCSPA, working in the field of cancer therapy, focusing on glioblastomas, nanotechnology and drug delivery systems, with part of his research being carried out in the Materials Research Institute at the Athlone Institute of Technology.
Extensive experience in cell biology, pharmacology, phytochemistry, toxicology, genotoxicity, mutagenicity and *in vitro* and *in vivo* assays.

ICARUS

UFCSPA

Research proposal

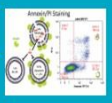
Lipid core nanoemulsions and polymeric nanostructures containing temozolomide and ferrocene compounds as therapeutic strategies for the treatment of glioblastomas



Temozolomide and ferrocene compounds

- Lipid core nanoemulsions
  - Characterisation
    - Cytotoxicity assays in T98G human glioblastoma cells
    - Cell death and oxidative stress assays in T98G cells
- Polyvinyl alcohol nanofibres
  - Characterisation
    - Cytotoxicity assays in T98G human glioblastoma cells
    - Cell death and oxidative stress assays in T98G cells
  - Drug release studies

In vivo assays using a rat brain tumour model



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Viviane Seba Sampaio

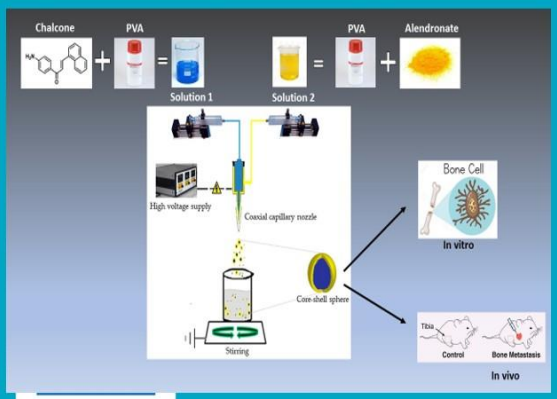
Biologist, with experience in microbiology, histochemistry, limnology, pisciculture and ichthyology. Master's Degree in Biotechnology at the University of Ribeirão Preto, focused on antiproliferative and antimetastatic activity of chalcones in osteosarcoma cell lines. Experience in cell culture, gene expression analysis (real-time PCR), cytotoxicity assays (MTT), cell migration and invasion, zymography, apoptosis and Western blotting. PhD student in the field of cancer therapy, focusing on bone cancer, chalcones, nanotechnology and drug delivery systems in the Materials Research Institute at the Athlone Institute of Technology (AIT), Ireland.

ICARUS 2

UNAERP

Research proposal

Development of a PVA-based nanoparticles with bone targeting for the controlled delivery of doxorubicin and chalcone.



PVA + chalcone + doxo(core)
PVA + alendronate(shell)

→ Nanoparticles
Drug encapsulation

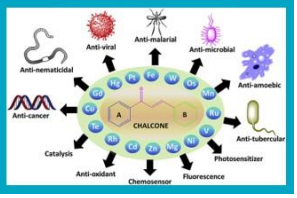
↓

Drug release
Characterization

→ Hpa assay
Cell tests

↓

Apoptotic effect
Invasion assay
In vivo tests



I am a first year PhD student with a Bsc (Hons) in Pharmaceutical Science from AIT and a degree in Pharmacy from University of Sunderland. I worked as a Team Lead with SK Biotek in Swords, Dublin for 6 years.

University of Sunderland

ICARUS 2

Everolimus is a targeted (biological) therapy. This group of drugs **block the growth and spread of cancer**. They target and interfere with processes in the cells that help cancer grow.

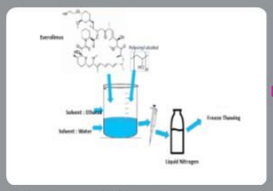
SEGA associated TSC

Proposal : To develop novel freeze-thawed PVA microspheres to improve the solubility of Everolimus and prolong the release time / prevent frequent administration of drug which can lead to systemic toxicities

↓

Hydrocephalus (Swelling in the brain) due to cysts and calcification

→



Production of Microsphere embedded Everolimus

→

In Vitro Cell line BBB

Slice Test to determine pH sensitivity and release rates) / Western Blotting – To detect expression of Ki-67 and caspase -3 at mRNA and protein levels.

→

↑

Potential Injectable Drug Delivery

Cian Bregazzi-Nevin MEng BEng

Lecturer in Mechanical Engineering at AIT with focus in Automation, Control & Robotics. Previously a lecturer in TUD Tallaght and NJUT China. Industrial employment in automated control system installation. Currently in 1st Year of PT PhD research program.

RUS

Development of Conductive Hydrogels as Smart Materials

PVA Hydrogel Base

Conductive Additives
- DMSO
- LiCl
- PEDOT
- Silver Nano Wire

Electrospinning
Casting
Laser Cutting

Coupled Hydrogel

Decoupled Hydrogel

Activation Through High & Low Voltage Application

Synthetic Muscle

Controlled Drug Release

Soft Robotic Actuator

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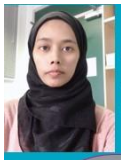
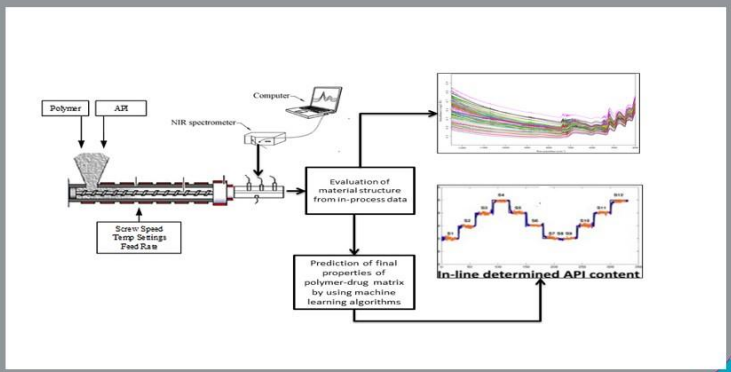
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



I am a second year PhD student with a BSC (Hons) in chemical engineering from UET Lahore, Pakistan, and masters degree in chemical and petroleum engineering from university of Bradford, UK. I worked as a research engineer for forward sports (Pakistan) for 2.5 years.

ICARUS 2

Proposal : in-line monitoring of hot melt extrusion process to predict the final properties of polymer drug matrix using machine learning



ICARUS 2

SUSTAINABLE POLYMER TECHNOLOGIES

Approximately 225kg of waste packaging was generated per person in 2020,
91kg of paper and cardboard,
62kg of plastic,
37kg of glass,
20kg of wood,
14kg of metal packaging per person.
In 2020, 62% of total waste packaging was recycled.

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SUSTAINABLE POLYMER TECHNOLOGIES

FUTURE JOBS 2019 a focus on sustainability,
energy efficiency, and renewable energy combined with a major reduction in reliance onfossil-based resources.
This includes the bioeconomy which aims to maximise the use of our renewable biological resources to create economic activity, employment and a sustainable society. Ireland is particularly well placed to develop a strong bioeconomy.

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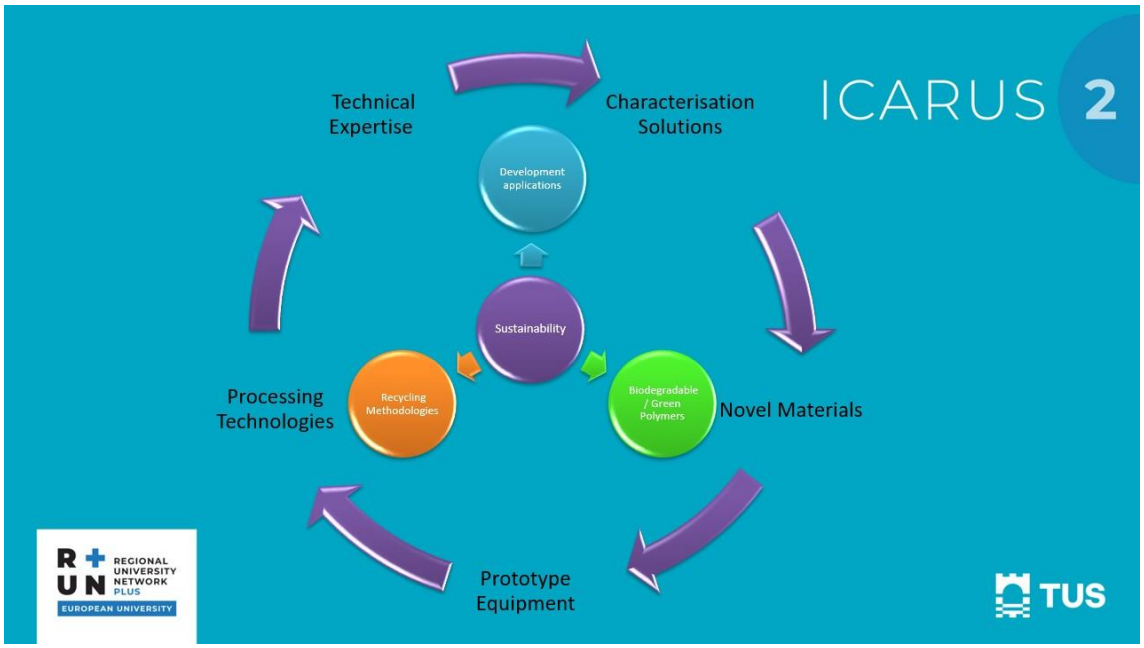

ICARUS 2

SUSTAINABLE POLYMER TECHNOLOGIES
Case study

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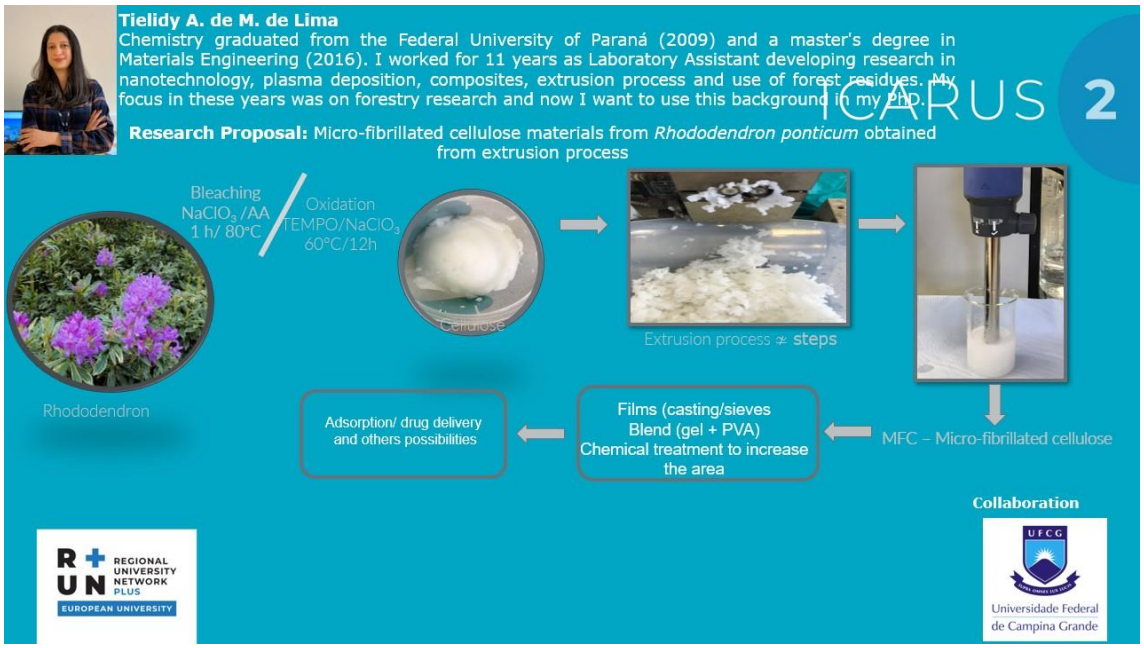
Tielidy A. de M. de Lima
Chemistry graduated from the Federal University of Paraná (2009) and a master's degree in Materials Engineering (2016). I worked for 11 years as Laboratory Assistant developing research in nanotechnology, plasma deposition, composites, extrusion process and use of forest residues. My focus in these years was on forestry research and now I want to use this background in my PhD.
ICARUS 2
Research Proposal: Micro-fibrillated cellulose materials from Rhododendron ponticum obtained from extrusion process
Bleaching
NaClO3 /AA
1 h/ 80°C
Oxidation
TEMPO/NaClO3
60°C/12h
Cellulose
Extrusion process ≠ steps
Rhododendron
MFC – Micro-fibrillated cellulose
Films (casting/sieves
Blend (gel + PVA)
Chemical treatment to increase the area
Adsorption/ drug delivery and others possibilities
Collaboration
Universidade Federal de Campina Grande
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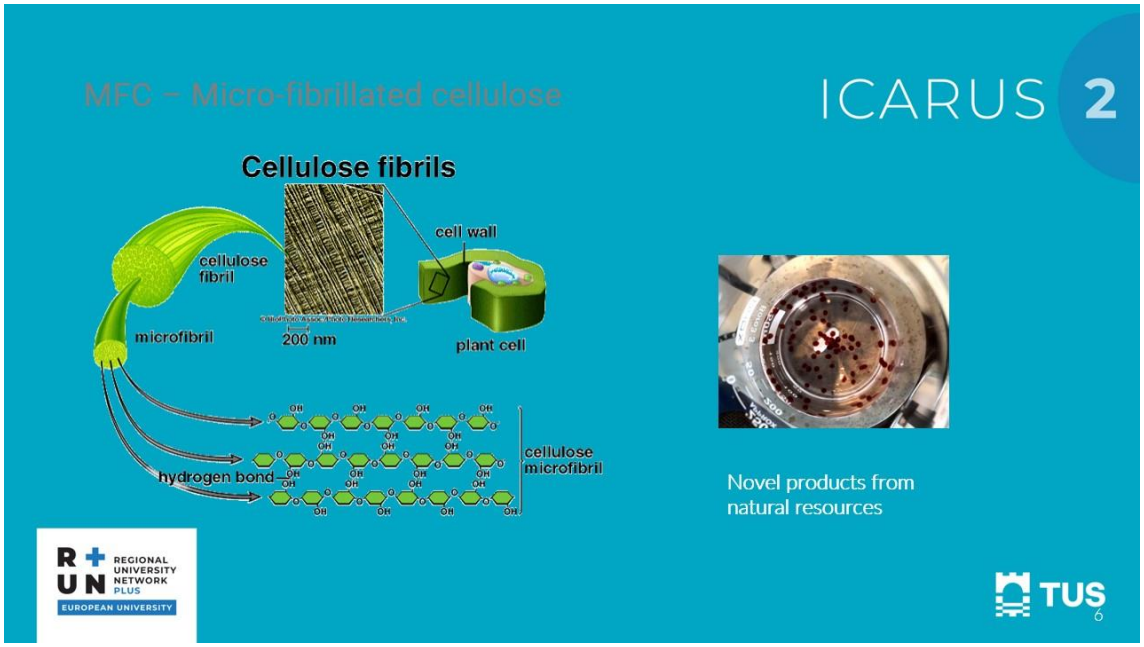
MFC – Micro-fibrillated cellulose
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Cellulose fibrils
cell wall
cellulose fibril
microfibril
200 nm
plant cell
hydrogen bond
cellulose microfibril
Novel products from natural resources
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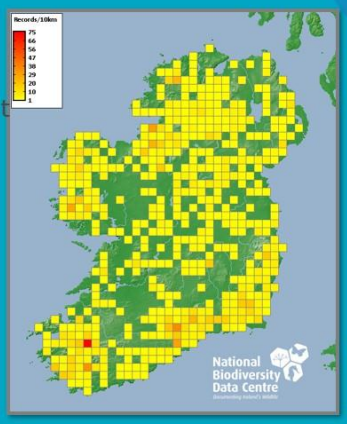
Rhododendron ponticum

Shrub - large perennial evergreen
Native to the Iberian Peninsula and Asia
Ireland - 18th Century - as an ornamental garden plant



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Rhododendron ponticum

Leaves

Freshstem

Old stem

Flower

Biorefinery proposal (antioxidants, MFC, scaffolds, biomaterials, cell viability)

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HAMK
HÄMEEN AMMATTIKORKEAKOULU
UNIVERSITY OF APPLIED SCIENCES

POLITÉCNICO DE LEIRIA | CDRSP CENTRE FOR RAPID AND SUSTAINABLE PRODUCT DEVELOPMENT

2

Scaffolds

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HAMK
HÄMEEN AMMATTIKORKEAKOULU
UNIVERSITY OF APPLIED SCIENCES

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Wood Leaves and flowers

Accelerated solvent extraction

Extraction - different solvents

Hydrogel 500µg/mL

antioxidants (ABTS, DPPH), GC/MS

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Final year undergraduate project investigating the effects of natural indigo on polypropylene.

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Natural Indigo and PP

HAMK HÄMEEN AMMATTIKORKEAKOULU UNIVERSITY OF APPLIED SCIENCES

TUS Technological University of the Shannon: Midlands Midwest Ollscoil Teicneolaíochta na Sionainne: Lár Tíre Iarthar Láir www.tus.ie

ICARUS 2

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RUN-EU Short Advanced Programme (SAP)

ICARUS 2

Circular Design, starting from a variety of concepts, passing through several important approaches and methodologies, and finally covering some specific tools.

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"PhD Skills"

ICARUS 2

1. Demonstrate a systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of the discipline or field of learning.
2. Critically discuss approaches to the creation and interpretation of new knowledge, through original research, or other advanced scholarship, of a quality to satisfy review by peers
3. Demonstrate a significant range of the principal skills, techniques, tools, practices and/or materials which are associated with the discipline or field of learning.
4. Critically evaluate abstract problems that expand and redefine existing procedural knowledge.

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"PhD Skills"

ICARUS 2

5. Exercise personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent contexts.
6. Communicate results of research and innovation to peers; engage in critical dialogue; lead and originate complex social processes.
7. Critique the broader implications of applying knowledge to particular contexts.
8. Scrutinise and reflect on social norms and relationships; whilst leading actions to change them.

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Thank You

5.5 Patrick Ruane

Special Projects Director, Johnson and Johnson Visioncare, Limerick, Ireland

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APPLICATION OF A HYBRID SIMULATION APPROACH TO AID THE DESIGN AND DEVELOPMENT OF AN AUTOMATED MANUFACTURING LINE

Johnson & Johnson Vision Care

- **Patrick Ruane**
- **Course: Doctor of Philosophy (Eng)**
- Dept of Electrical & Electronic Engineering
  - **Dr Patrick Walsh**
  - **Dr John Cosgrove**
  - **Dr Siobhan Moane**

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TUS · POLITÉCNICO DE LEIRIA · HAMK · IPCA · NHL STENDEN · SZÉCHENYI EGYETEM · FHV Vorarlberg University of Applied Sciences

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INTRODUCTION

Johnson & Johnson Vision Care

TUS

- Johnson & Johnson Vision Care (JJVC)
  - Subsidiary of **Johnson & Johnson** – Largest Healthcare company in the world.
  - Design and Manufacture Vision Correction Contact Lenses
  - Global Contact Lens Market of $8B annual sales, JJVC have >40% market share.
  - JJVC Contact Lens business growing ~ 5%/pa. (Need for additional Mfg Equip)
  - JJVC 2 sites (Florida and Limerick, Ireland)
  - Limerick – Largest Contact Lens plant in the world.

- Patrick Ruane
  - Special Projects Director - Johnson & Johnson Vision Care
    - BEng (Mech/Mfg Eng) with 30yrs Industrial Experience
    - Design Director responsible for the design/development of fully automated manufacturing lines for Contact Lenses.
    - Project Director for many Capital Projects in excess of $500MM total.
  - Personal Motivation for PhD:
    - Develop expertise in Simulation & Optimization.
    - Personal desire to continuously pursue new learnings.
    - Deliver a new approach/system to the business.
    - Career Advancement.

JJVC TECHNOLOGY

- Highly Automated Manufacturing Equipment (> 60 Lines Total)
  - Manufacturing Line cost in excess of $30MM
  - Primary KPI's are: Quality, Safety & Lenses per shift (LPS)
  - Fully Integrated Manufacturing Lines Consisting of:
    - Injection Moulding Machines
    - Monomer dosing systems.
    - LED Curing tunnels.
    - Robotics
    - Linear Synchronous Motor Technology
    - Servo Drives
    - Conveyors
    - Intelligent Sensing
    - Vision Inspection
    - Sterilization Systems
    - Packaging & Case Packing
    - PLCs, Active Factory and Historian Databases

JJVC PROBLEM DEFINITION

Based on:

1. Literature Review.
2. Industrial Experience.
3. Management feedback:
4. Discussion with OEMs:

Four significant issues were identified:

1. Reduce overall time for manufacturing equipment delivery.
2. Reduce time for equipment design phase.
3. System/Approach to verify concept designs for continuous improvement.
4. System to aid in predicting Line capability.

RESEARCH INTRODUCTION

Simulation and optimisation approaches have been reviewed, with the aim of using these digitalization technologies to analyse and optimise a Tray Loader system configuration at Johnson & Johnson Vision Care Ireland.

This research **combined a simulation/digital model (JaamSim) with an optimization engine** to provide design/manufacturing engineers a valuable digitalization template/method to optimize the design of automated equipment with the aim of improving line performance.

The digital model was **derived from a real-world automated manufacturing line** and verified/validated against actual line performance data.

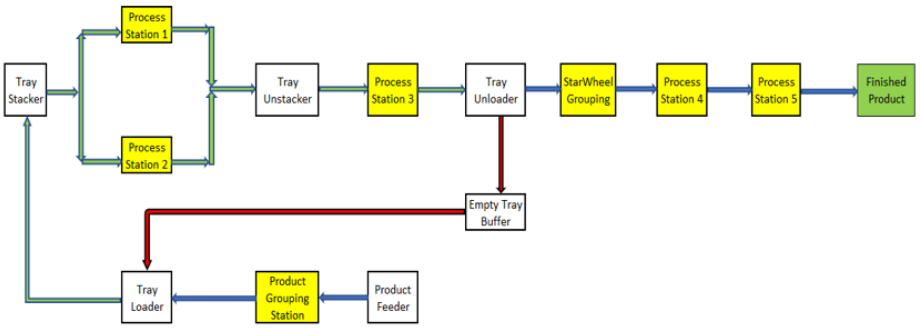
The model was then **integrated with two different optimisation systems namely SimWrapper and an author developed optimization engine** using a popular genetic algorithm meta-heuristic approach that uses the fitness of solutions to determine whether or not to evaluate them using the digital model.

The overall system was designed and developed to demonstrate and **evaluate the use of Digitalization to support the design of automated manufacturing lines**.

DIGITAL MODEL & OPTIMIZATION ENGINE ADVANTAGES

1. Test different scenarios using digital model and determine the impact to line performance.
2. Test new line design early in the line development process.
3. Determine impact of workstation changes (Cycle time , MTBF and MTTR) on overall line performance. (New & Existing Lines)
4. Determine Optimum Line conditions in a MOOP.
5. Reduce line design time by ~ 3 – 4 Months
6. Reduce time to market ~ 6 – 8 Months : (24mth Project).
7. Reduce impact of making line changes before/after FAT/SAT.
8. Valuable tool for Engineering to use in manufacturing line development.

Tray Loader System Overview



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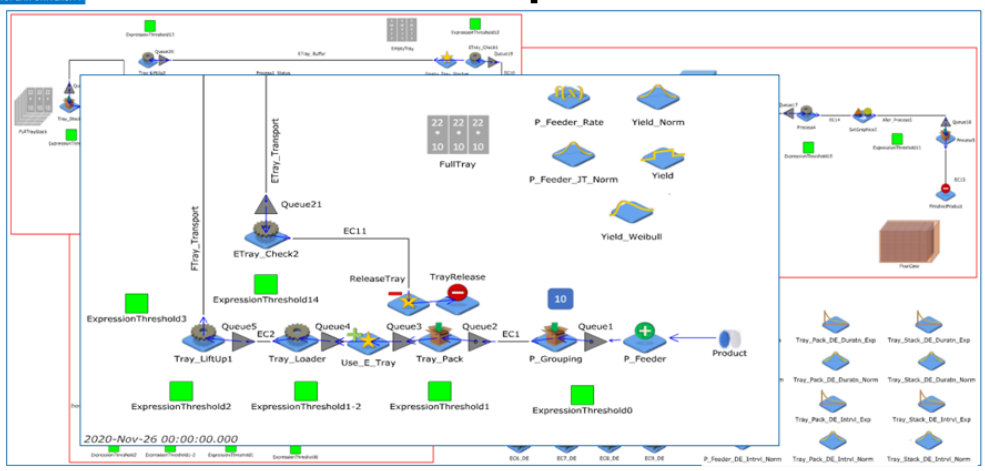
Tray Loader System Digital Model Developed



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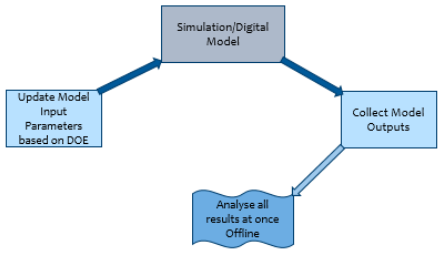
DIGITAL MODEL VALIDATION

- Collection of live data from the actual Tray Loader system (Factory Talk & Historian Database)
  - Throughput/Yield: 5GT Production Line #60 – Every Shift over 3 Months (24/7 Operation).
  - Station Uptime Data: 5GT Line #60 – Every Station over 129,000 Mins.
- Model Verified and Validated based on:
  - Development of simulation model input parameters
    - P_Feeder_Rate : Distribution & Parameters – (Johnson Transformation)
    - Yield (Distribution & Parameters – Weibull Distribution)
    - MTBF Distributions & Parameters
    - MTTR Distributions & Parameters
  - Operating Thresholds (Conditions the allow Object/Station to Operate)
  - Statistical Tests for comparing simulated and actual system data (two sample t tests).
  - Statistically show that data from the Simulation Model has a prediction error of ~ 0.2%

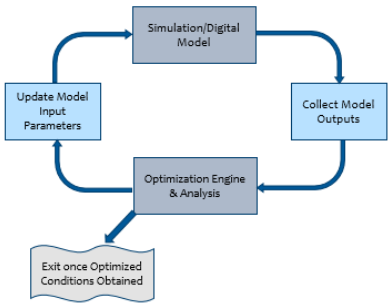
DIGITAL MODEL/SIMULATION OPTIMIZATION CURRENT STRATEGY



Existing Simulation/Digital Model

1. No Optimization capability
2. Open Loop
3. Manual update of Model input parameters.
4. Manual review of model outputs.
5. Manual decision making of new model input parameters.
6. Time consuming, cumbersome and slow.

DIGITAL MODEL /SIMULATION OPTIMIZATION NEW STRATEGY



Goal: Allows designer to choose multiple simulation inputs to vary and then apply one or more constraints and objectives. Determine best settings/line design in order to maximize and/or minimize specific objectives.

Method: Use advanced metaheuristic search methods to drive iterative simulation runs with different simulation input combinations

JaamSim does not have Optimization Engine.

Process:
- Define initial Factors and Setting range.
- Execute Simulation Run -> Produce Output.
- Optimization Engine -> Analyse Outputs & then recommend new factor settings
- Execute New Simulation run.
- Repeat Process until Outputs are Optimized.

Benefits
- Optimization Engine recommends
- Optimum Line Factors/Settings
- Accuracy increased.
- Faster to Obtain Optimum Solutions.

Tray Loader System
- 7 Factors (21 – 31 Levels each factor)
- >2.6 Billion solution combinations
- Impossible to find optimum solution using standard techniques

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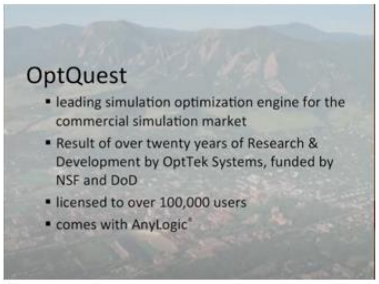
SIMWRAPPER BLACK BOX OPTIMIZATION



System: General-purpose commercial optimization software known as SimWrapper® operates by treating the objective function evaluation as a black box. Developed by OptTek System, Inc.

Method: It supports constrained or unconstrained optimization with one or more objectives, and allows linear, nonlinear, or more complex functions using the **OptQuest** Engine.

SimWrapper is a cross-platform, Java application that can be used to wrap any new or legacy model.

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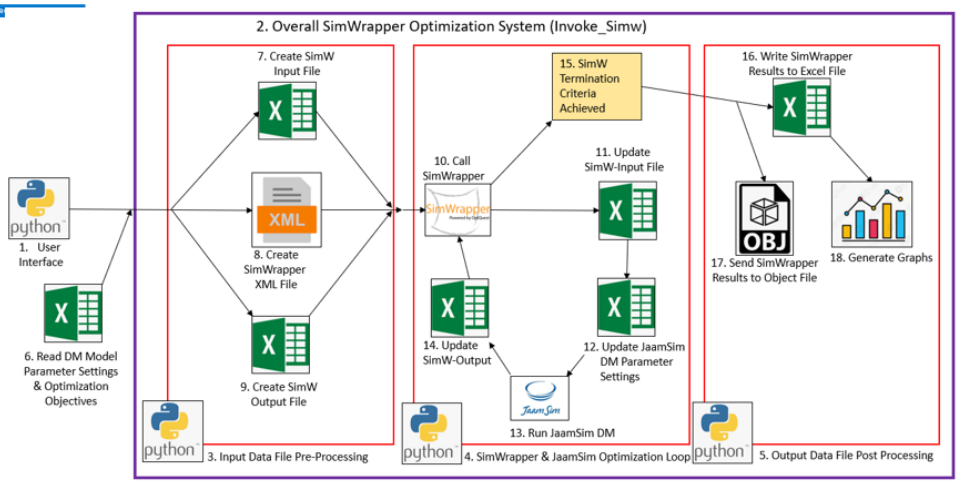
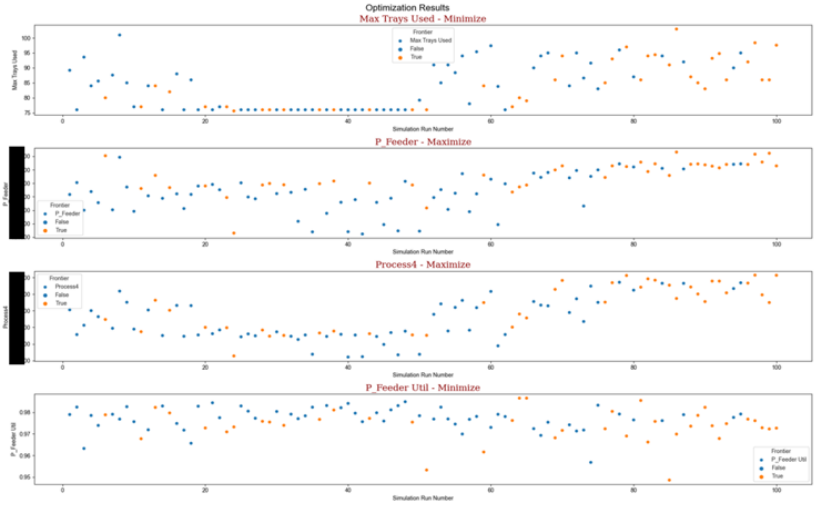
OVERALL SIMWRAPPER INTEGRATION WITH TRAY LOADER DM



SIMWRAPPER OPTIMIZATION RESULTS



GENETIC ALGORITHMS

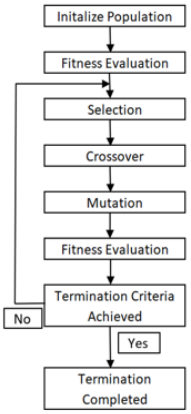
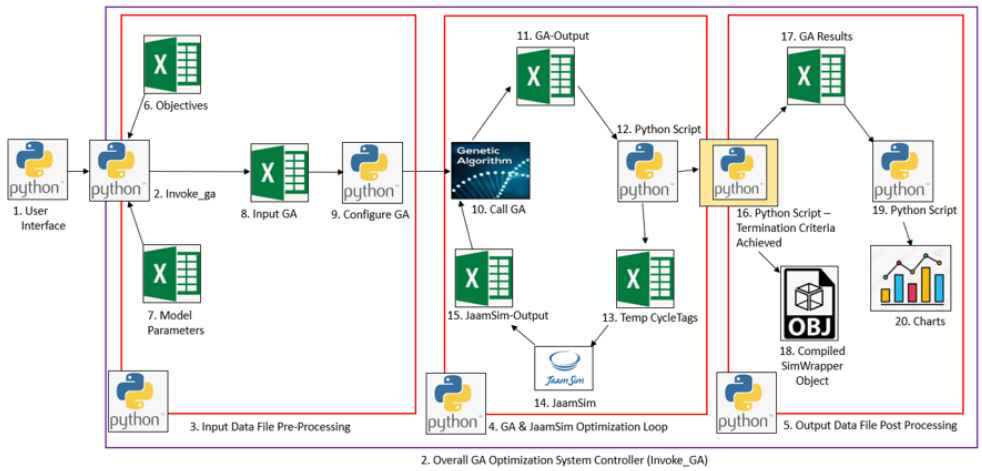


Figure 8.2: Genetic Algorithm Flowchart (Kok, et al. 2015)

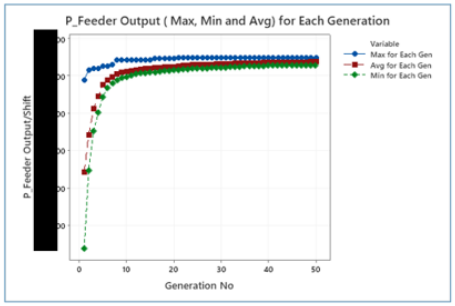
- Meta-Heuristic Optimization Method due to capability of finding optimal solutions.
- Simulates the process of evolution (Population of solutions -> Apply genetic operations to each reproduction.
- GAs are based on Darwin's Theory of Natural Evolution. This algorithm reflects the process of natural selection where the fittest individuals are selected for reproduction in order to produce offspring of the next generation.
- Several GA config parameters are required (Pop Size, Crossover, Mutation
- Fitness value – Test degree of how good a solution is.

OVERALL GA INTEGRATION WITH TRAY LOADER DM

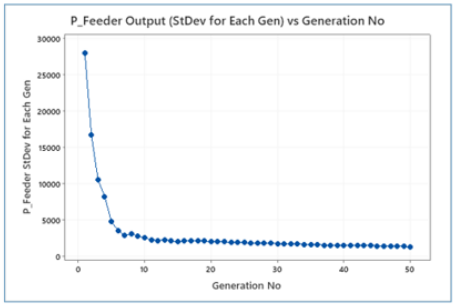


2. Overall GA Optimization System Controller (Invoke_GA)

NSGA-II OPTIMIZATION ENGINE TESTING(SINGLE OBJECTIVE)



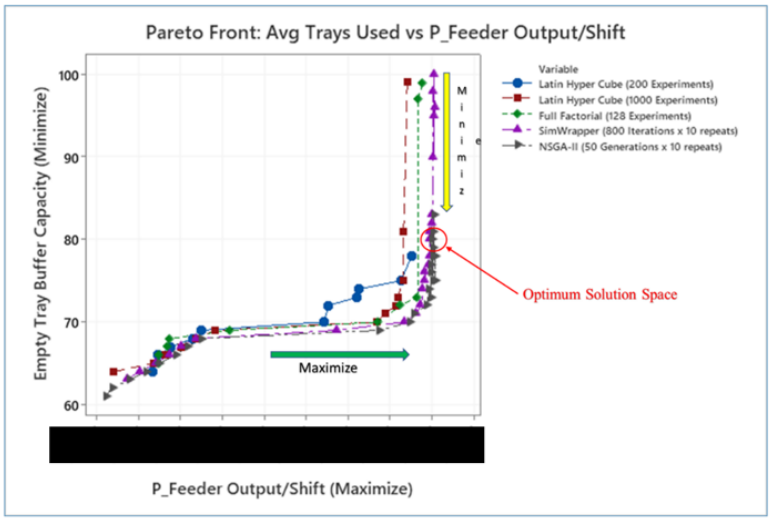
NSGA-II Optimization Run #1.



NSGA-II Optimization Run #1.

Indicating that the NSGA-II optimization Engine has reached an Optimum solution.

PARETO FRONT OF TRAYS USED VS P_FEEDER OUTPUT (2 OBJECTIVES)



RESEARCH SUMMARY

1. Digital Model of Tray Loader System developed using JaamSim (Verified and Validated) ~ 0.2% Prediction error.
   a. Actual line data collected (throughput, station uptime, cycle time, yield) over 3 month time period.
   b. Sensitivity studies completed
2. Metamodel development and how this model can be used very quickly to show the impact of line parameter/design changes have on the line performance (throughput).
3. Optimization system developed using both a black box optimizer (SimWrapper) & Genetic Algorithm (NSGA-II).
4. Study completed to compare the performance of both engines (1, 2 & 3 objective optimization problems).
5. The GA optimization engine allows:
   a. User configured, specific to the system application problem.
   b. Allows for further refinement to obtain better solutions.
6. Enables further research for other types of applications to maximize performance from automated manufacturing lines.

PUBLICATIONS

Ruane, P. (2022, June 10). Validation of a Simulation/Digital Model for Use. *Johnson & Johnson Innovation Summit*. Johnson & Johnson Vision.

Ruane, P., Walsh, P., & Cosgrove, J. (2021). A Review of Simulation Models used for Manufacturing Equipment Design . *International Manufacturing Conference (IMC37).* Athlone, Ireland.

Ruane, P., Walsh, P., & Cosgrove, J. (2021). An Approach to Verification and Validation of a Digital Twin for an Industrial Use-case. *International Manufacturing Forum Series (IMFS 2021).* Portugal: Politecnico De Leiria.

Ruane, P., Walsh, P., & Cosgrove, J. (2022, October 26). Development of a Digital Model and Metamodel to Improve the Performance of an Automated Manufacturing Line. *Journal of Manufacturing Systems*, 538-549. doi:https://doi.org/10.1016/j.jmsy.2022.10.011

Ruane, P., Walsh, P., & Cosgrove, J. (2022, August 31). Simulation and Genetic Algorithms to Improve the Performance of an Automated Manufacturing Line. *ACTA Technica Jaurinensis - ATJ, 15*(3), 174-187. doi:https://dx.doi.org/10.14513/actatechjaur.00668

Ruane, P., Walsh, P., & Cosgrove, J. (2022). Validation of a Digital Simulation Model for Maintenance in a High-Volume Automated Manufacturing Facility. *5th IFAC Workshop on Advanced Maintenance Engineering, Services, and Technology. 55*, pp. 127-132. Bogotá, Colombia: ELSEVIER. doi:https://doi.org/10.1016/j.ifacol.2022.09.195

Ruane, P., Walsh, P., & Cosgrove, J. (n.d.). Using Simulation Optimization to Improve the Performance of an Automated Manufacturing Line. *4th International Conference on Industry 4.0 and Smart Manufacturing* (pp. 1-10). Procedia Computer Science.

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R+UN REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

THANK YOU!

ANY QUESTIONS ?

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5.6 Dr Paul Archbold

Director of Sustainable Infrastructure Research Group, TUS
Arpan Joshi, PhD Student, TUS & IPL, Portugal

TUS & IP LEIRIA

TUS
Technological University of the Shannon: Midlands Midwest
Ollscoil Teicneolaíochta na Sionainne: Lár Tíre Iarthar Láir

POLITÉCNICO DE LEIRIA
CDRSP CENTRO PARA O DESENVOLVIMENTO RÁPIDO E SUSTENTADO DE PRODUTO

BACKGROUND

SUSTAINABLE INFRASTRUCTURE RESEARCH GROUP (SUIR) TUS

- Staff and postgraduate students
- General area of sustainable infrastructure, circular economy
- Sustainable concrete technology,
- Digitisation of construction processes
- Innovative construction materials and processes
- Quality management in construction.

BACKGROUND

CENTRE FOR RAPID AND SUSTIANABLE PRODUCT DEVELOPMENT (CDRSP), LEIRIA

- Staff and postgraduate students
- Emerging technologies
- Advanced materials
- Sustainable manufacturing and manufacturing of green technologies

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INTRODUCTION

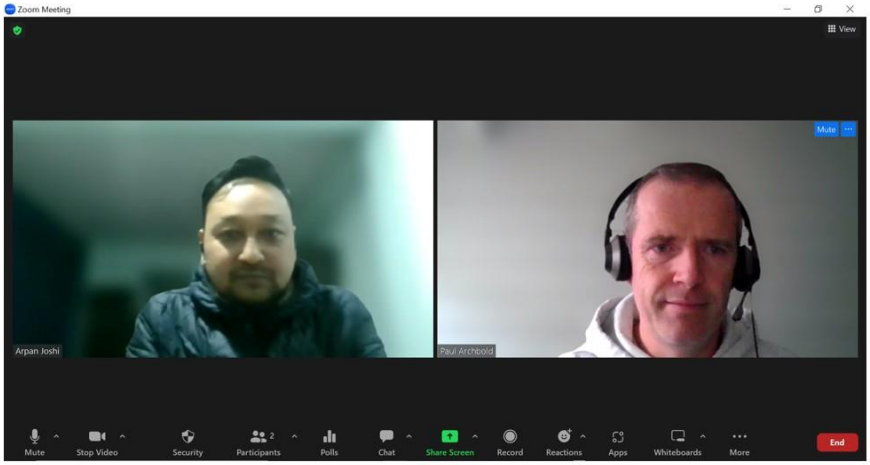
www.run-eu.eu

TUS RUN-EU PHD SCHOLARSHIP CALL 2022

- Initial contact by Arpan
- Application submitted for PhD jointly supervised by Paul Archbold (TUS) and Florindo Jose Mendes Gaspar (IPLeiria)
- Successful in securing funding
- Arpan commenced work on his PhD in October 2022

LEIRIA

PHD SUPERVISION



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RESEARCH TO DATE

Incorporation of Forest Biomass-Based Flyash in Cement for 3D Printing

Arpan Joshi

www.run-eu.eu

RESEARCH MOTIVATION

a. European Green Deal and Sustainable Development Goals

b. Circular Economy

c. 1 ton of cement = 1 ton CO2

d. 4.4 billion metric tons of cement is produced in 2020 (Lim,2020)

e. To utilize circular resources such as BMFA in cement for sustainable 3D printing

RESEARCH MOTIVATION

Why Biomass Flyash (BMFA)?

a. Production of **BMFA increases** each year
b. DEGs promotes the use of biomass for the production of electricity

RESEARCH MOTIVATION

Why BMFA?

c. **Management of waste:** Waste material generated in power plants and industries for the generation of heat and electricity

OBJECTIVE

a. To utilize the waste (BMFA) as a partial replacement of cement **(10%, 15%, 20% and 30%)** for sustainable 3D printing

b. To compare the rheology of mortar composition developed after the partial replacement of cement with various BMFA content at a constant slump flow value of **14.5 cm**

c. To understand the relationship between **yield stress, plastic viscosity on printability and buildability**

d. To understand the **pumpability and workability** of the mortar with increasing content of BMFA in the mix.

MATERIAL AND METHODS

1. **Particle size distribution of Biomass Flyash (BMFA)**

   a. D10 = 9.75 µm

   a. D50 = 123 µm and

   b. D90 = 433 µm respectively

According to ASTM C618, Fly Ash can be classified as
➢ Class F Pozzolan if **SiO2+ AL2O3+Fe2O3** > 70%

2. **Chemical composition of BMFA by mass percentage**

SiO_2	Al_2O_3	Fe_2O_3	CaO	Cr_2O_3	K_2O	SO_3	Na_2O	MgO	TiO_2	P_2O_5	MnO
69.4	6.6	1.6	9.9	5.2	2.5	1.2	1	0.6	0.4	0.2	0.1

MATERIAL AND METHODS

1. **Cement:** CEM I 42.5 R
2. **Sand:** Maximum aggregate size of **1mm**
3. **Superplasticizer:** (1%) Woerment FM 422
4. **Filler:** Limestone filler (15%)
5. **Mix Ratio:** 1:2

MATERIAL AND METHODS

Measurement of Rheological Parameters

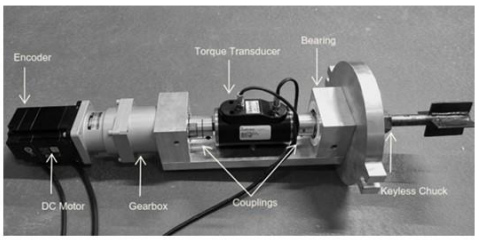


Figure: Torque sensor with vane apparatus

MATERIAL AND METHODS

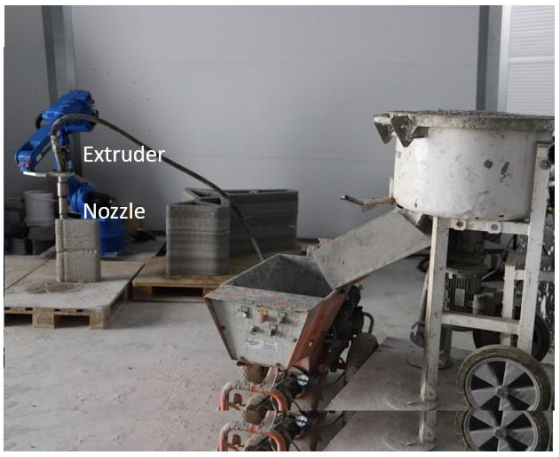


Figure: Experimental setup of 3D concrete printing

MATERIAL AND METHODS

Buildability = Ability to retain shape once extruded.

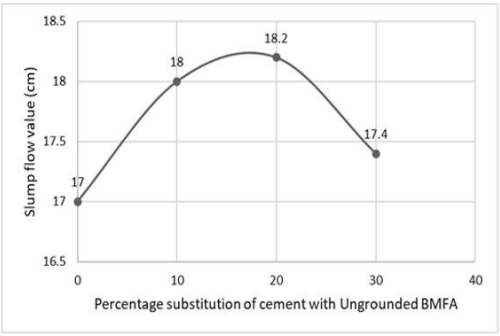
Criteria to Assess Buildability:

- number of concrete layers that could be built without noticeable deformation of the lower layers
- maximum height printed before collapsing

Figure: Assessment of buildability

RESULTS AND DISCUSSION – SLUMP FLOW AT CONSTANT WATER

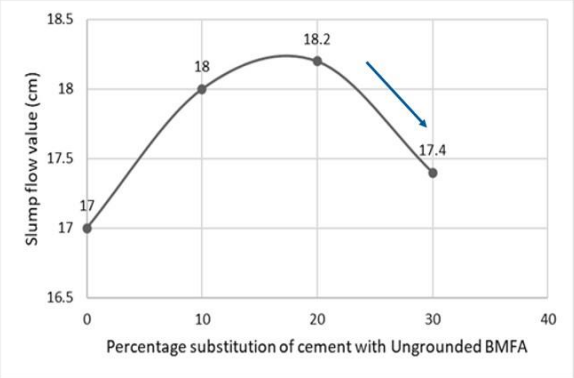
1. Constant water to binder ratio **(w/b=0.4)**
2. Slump flow value increased with increasing replacement of cement up to 20%



- Fineness, Spherical shape and Glassy surface
- Ball bearing effect

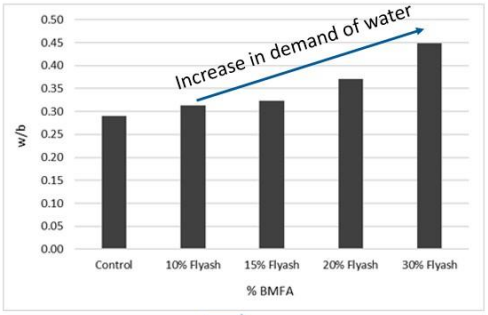
RESULTS AND DISCUSSION – SLUMP FLOW AT CONSTANT WATER

- Decrease in slump beyond 20% replacement
- Decrease in workability
  - ➢ Porous structure
  - ➢ Absorption of more water



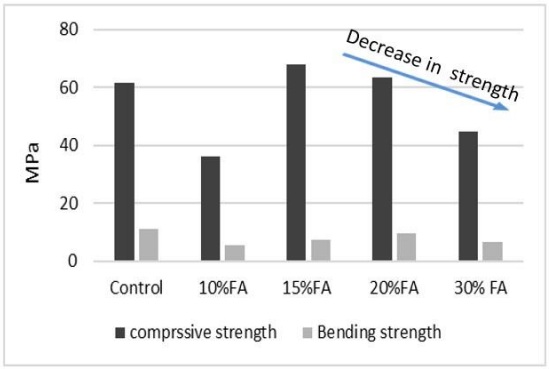
RESULTS AND DISCUSSION – SLUMP FLOW (CONSTANT SLUMP OF 14.5CM

Water demand increases with increasing partial replacement of cement



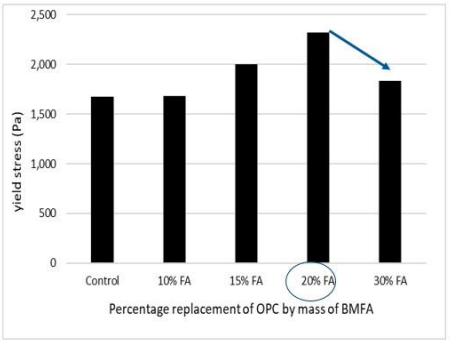
RESULTS AND DISCUSSION – COMPRESSIVE STRENGTH

1. The mortar mix with 10% BMFA exhibited lower compressive strength
2. Decrease in compressive strength after 15% replacement with BMFA
3. The better compressive strength with application above 10% BMFA might be due to
   - Filling effects
   - Better compaction



RESULTS AND DISCUSSION - RHEOLOGY: STATIC YIELD STRESS

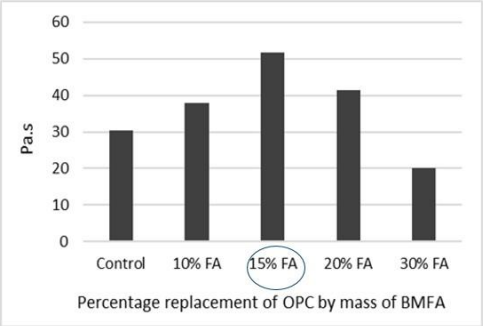
1. Improved yield stress with all percentage BMFA
2. The decrease in yield stress for 30% replacement is due to the increase in w/b ratio
3. The trend of increasing yield stress until 20% BMFA resembles closely with the slump flow behaviour



RESULTS AND DISCUSSION – RHEOLOGY: PLASTIC VISCOSITY

1. Plastic viscosity increases with increasing percentage of BMFA until 20% replacement of cement

2. The decrease in plastic viscosity for 30% replacement is due to the increase in w/b ratio

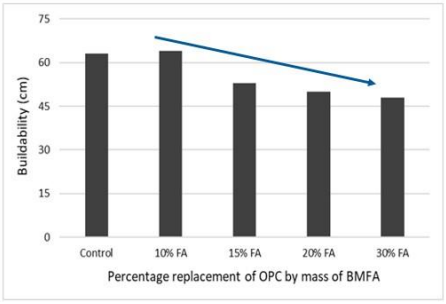


RESULTS AND DISCUSSION - BUILDABILITY

1. Highest buildability was observed for 10% BMFA

2. Decrease in buildability with increasing BMFA

3. The results of buildability are not in line with the yield stress and plastic viscosity



4. The key factors that played role in buildability are: mortar composition, **w/b ratio** and the **water absorption** by the binders and aggregates

CONCLUSION

1. The replacement of cement with BMFA up to 20% will attain a buildability level that is comparable to that of the control mix

2. However, taking into consideration of better pumpability and buildability, the **mix with 10% BMFA** might be preferred since it exhibits similar **plastic viscosity** and **buildability** as compared to control mix and performed well in the 3D printing process

3. Even for mixes with similar slump flow values, differences in the composition lead to **different behaviour** in terms of buildability and printability when stress is applied

FUTURE WORK

1. The results of this study allow a better understanding of the effect of BMFA in concrete 3D printing and serve as a basis for further research and applications

2. Further investigations on following properties are needed to fortify the results obtained

- Rheological behaviour
- Properties influencing 3D printing such as Pumpability, Flowability, Printability and buildability

FUTURE RESEARCH

- Paul Archbold

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RESEARCH EXPANSION

- Guest Editors for Special Issue
- Potential development of SAP
- Framework in place for further PhD students

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NEXT STEPS

FINAL THOUGHTS

- Exciting new avenue for joint research
- RUN-EU and Run-EU+ instrumental in bringing research institutes together
- Remote supervision works (so far)!!
- Upside to Covid-19 pandemic

5.7 Dr João Vilaça

Head of Research, IPCA, Portugal

REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

Joint PhD Supervision across the RUN-EU Alliance

- Collaborative Professional Pratice-based Doctoral Programmes -

João L. Vilaça, IPCA, Portugal

ICARUS 2022 - International Conference on Applied Research with Business and Society

14-12-2022

Horizon 2020 European Union Funding for Research & Innovation
The content of this publication represents the views of the author only and is his/her sole responsibility. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains. Grant Agreement Number: 101004506.

TUS · POLITÉCNICO DE LEIRIA · HAMK · IPCA · MILI STENDEN · SZÉCHENYI ISTVÁN · HVA

Overview

- IPCA R&D
- IPCA Ongoing PhD with Medical Companies
- New Joint PhD (IPCA + TUS)

IPCA INSTITUTO POLITÉCNICO DO CÁVADO E DO AVE

RUN REGIONAL UNIVERSITY NETWORK EUROPEAN UNIVERSITY

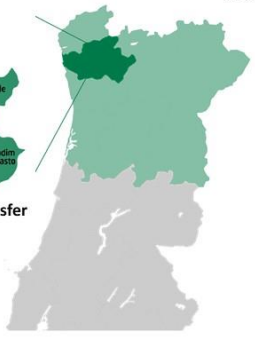
IPCA R&D

IPCA INSTITUTO POLITÉCNICO DO CÁVADO E DO AVE

RUN REGIONAL UNIVERSITY NETWORK EUROPEAN UNIVERSITY

IPCA REGION

STRONG CONNECTION WITH THE BUSINESS PRODUCTIVE SECTOR



Applied research and knowledge transfer

- Co-promotion R&D projects
- Internships
- High Specialized services
- Business Advisory Committee
- R&D&I ecosystem

COMPANIES

SME:

Continental Mabor; Coindu, Bosch; Primavera BBS, Gabor,...

Strong exporting vocation and intensity

Significant evolution in the innovation indicators: High investment in R&D Companies > national average

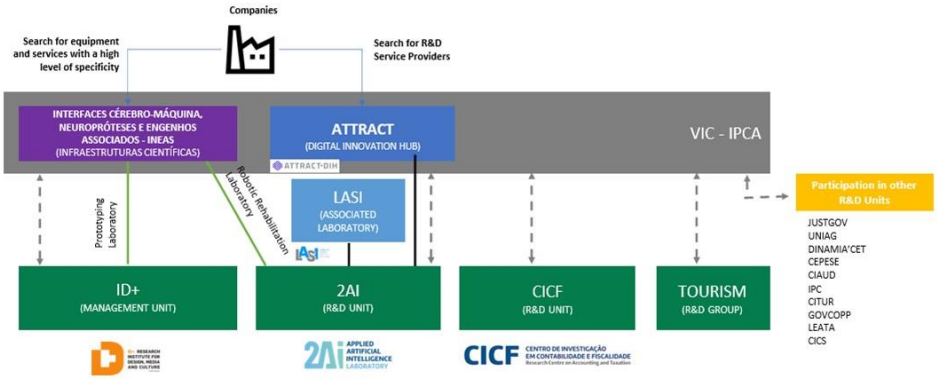
Significant rise in the sector of medium technological intensity

Increase in the services sector: new technologies and tourism

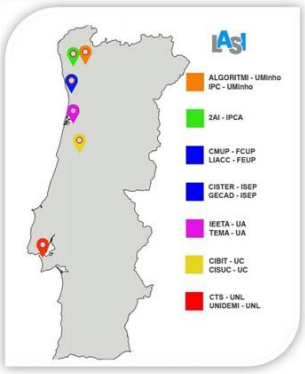
Anchor Companies:

Leica; Louropele; Vishay; TMG; Lameirinho; Fortunato Frederico; Pizarro; DST; Casais; Torrestir; Bysteel; Celoplas; Impetus; Valerius; Kristaltek; Solidal,...

R&D+I STRUCTURE



LASI vision is to advance edge knowledge in Intelligent Systems to support our society in an innovative, ethical, and sustainable path for the 21st century.



5 Thematic lines

- Innovative and Sustainable Industries
- Smart Cities, Energy and Mobility
- Infrastructures and Highly Connected Society
- Health and Well-being
- Public Administration and Government

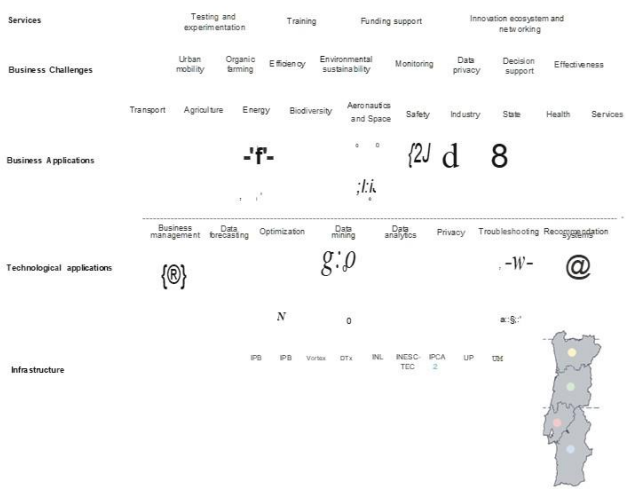
13 R&D units
7 Universities/Polytechnics
534 Integrated Members

IPCA

211 APPLIED ARTIFICIAL INTELLIGENCE LABORATORY

il Uiit AT RAC

ArTificial InTelligence and High-PeRformAnce CompuTing@ Portugal Digital Innovation Hub



IPCA Ongoing PhD with Medical Companies

IPCA INSTITUTO POLITÉCNICO DO CÁVADO E DO AVE

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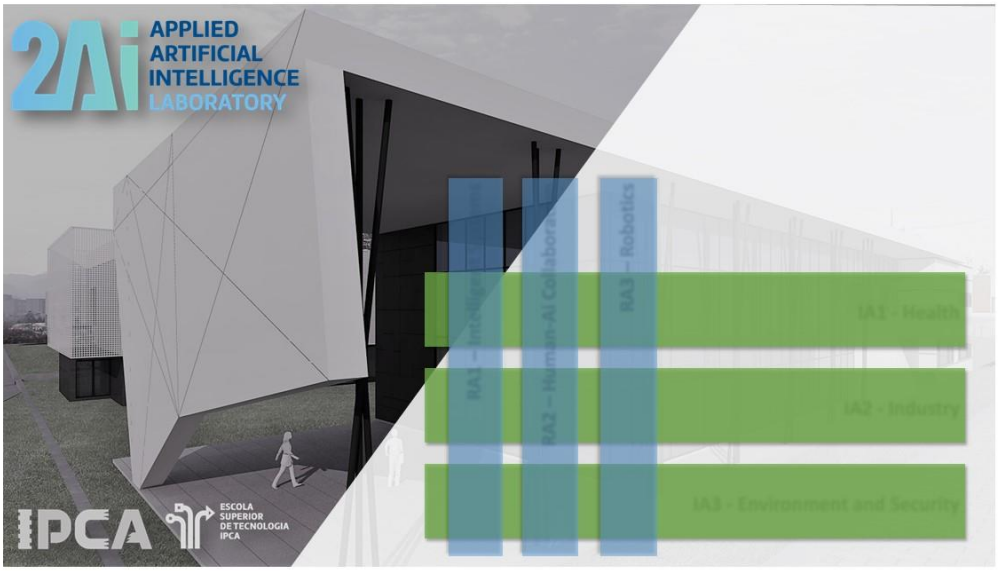
2Ai
APPLIED
ARTIFICIAL
INTELLIGENCE
LABORATORY
IPCA
ESCOLA
SUPERIOR
DE TECNOLOGIA
IPCA


2Ai
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ESCOLA
SUPERIOR
DE TECNOLOGIA
IPCA
IA1 - Health
IA2 - Industry
IA3 - Environment and Security

KidneyNAV

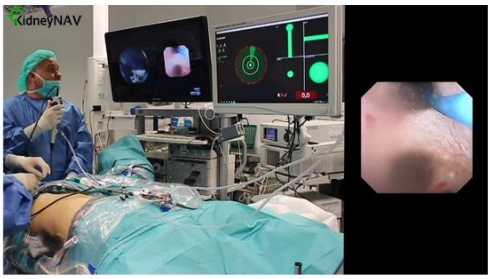
Navigation system for percutaneous renal access based on electromagnetic navigation system.

KIDNEY STONES

- Affects **10%** of the population worldwide
- Male predominance of **80%**
- Recurrence rate close to **50%**
- Kidney stones can form anywhere in the urinary tract

Partners

IPCA

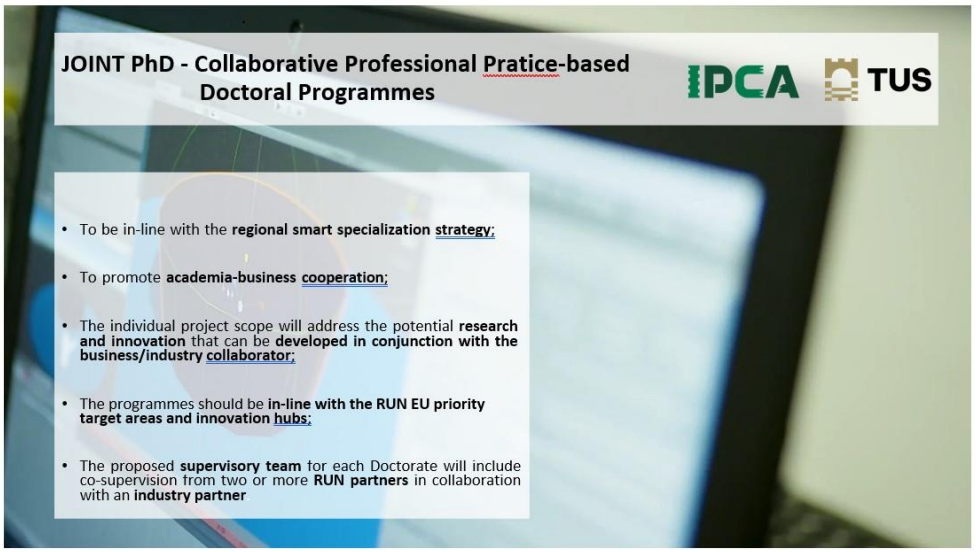


- ✓ Broad the PRA procedure to surgeons less specialized Eliminate X-ray imaging
- ✓ Improve preoperative planning
- ✓ Reduce surgery time
- ✓ Minimize potential surgical complications
- ✓ Decrease human errors
- ✓ Reduce surgery costs

2Ai APPLIED ARTIFICIAL INTELLIGENCE LABORATORY


JOINT PhD – Professional Research Based Programme
Programme: PhD in Medical Technology
Duration: 4 Years (240 ECTS); 2021-2024
Parteners: IPCA(2Ai R&D Unit); UM(ICVS R&D Unit); MEDTECH Company
Fields: Artificial Inteligente; Medical Robotics; Surgical Navigation; Surgical Sciences;
Number of PhD Students: 6


NEW JOINT PhD
IPCA &
TUS
IPCA
INSTITUTO POLITÉCNICO DO CÁVADO E DO AVE
RUN
REGIONAL UNIVERSITY NETWORK
EUROPEAN UNIVERSITY



JOINT PhD - Collaborative Professional Pratice-based Doctoral Programmes

IPCA TUS

FCT
Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

Total Budget: 935 k€

Number of PhD programmes: 11

Type of GRANT: International PhD Scholarship

GRANT Value: 1144€/month (Portugal)
1954€/month (abroad)

PRR
Plano de Recuperação e Resiliência

Universal Code: C644937233-00000047
Programme: Agendas/Alianças Mobilizadoras Para A Reindustrialização

Total Budget: 670 k€

Number of PhD programmes: 11

Type of GRANT: International PhD Scholarship

GRANT Value: 1144€/month (Portugal)
1954€/month (abroad)

JOINT PhD - Collaborative Professional Pratice-based Doctoral Programmes

RUN- EU Innovation Hub:
Future and Sustainable Industries

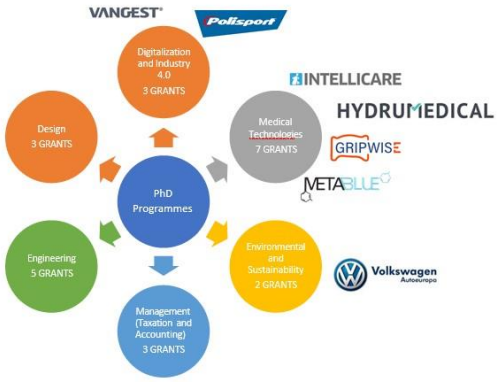
RUN-EU Research Areas:
Creative Art, Design & Materials Thinking

IoT & Cybersecurity

Smart, Sustainable & Advanced Manufacturing

Climate Change – Circular Economy & Decarbonisation

Health & Wellbeing



JOINT PhD - Collaborative Professional Practice-based Doctoral Programmes

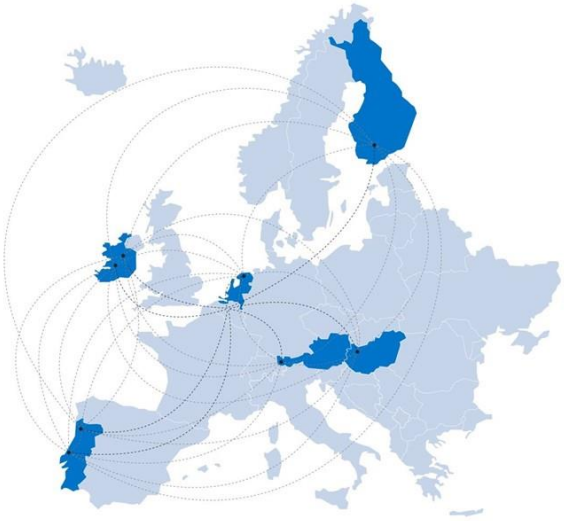
JOINT PhD RUN-EU PLUS	Curricular Units/modules	ECTS	Semester/Year	Institution
Structured 60 ECTS (1 year) + Research Project 120 ECTS (2 years)	Literature Review	10	1/1 (tutoring)	IPCA + TUS
	Thesis Plan	15	2/1 (tutoring)	IPCA + TUS
	Participation in international conference	5 ECTS per participation	During the course	IPCA + TUS
	Publication in International Journal indexed in the Web of Science or Scopus or Patent	10 ECTS per publication	During the course	IPCA + TUS
	RUN SAP - Short Advanced Programs	2 ECTS per SAP of 1 week (maximum of 5 SAPs = 10 ECTS)	During the course	All RUN Institutions
	Ethics, Scientific Integrity and Good Practices	5 ECTS	2/1 (e-learning)	TUS
	Research Methodology and Scientific Writing	5 ECTS	1/1 (e-learning)	TUS
	Internships	5 ECTS per participation (2 weeks)	During the course	IPCA + TUS + Company
	R&D Laboratory Rotations	5 ECTS per participation (2 weeks)	During the course	IPCA + TUS + R&D Unit or R&D Dep. of a Company

Thank you
for your attention

João L. Vilaça
jvilaca@ipca.pt

IPCA INSTITUTO POLITÉCNICO DO CÁVADO E DO AVE

RUN REGIONAL UNIVERSITY NETWORK EUROPEAN UNIVERSITY



5.8 Dr. Norbert Kovacs

Head of the Smart Project Consulting Ltd, Hungary

REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

How Engagement with RUN-EU can support Business Development

Norbert Kovács, Ph.D.
associate professor, Széchenyi István University
CFO and owner, Smart Project Consulting Informatics Ltd., Győr, Hungary

Horizon 2020 European Union Funding for Research & Innovation
The content of this publication represents the views of the author only and is his/her sole responsibility. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains. Grant Agreement Number: 101005810.

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REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

PRESENTATION STRUCTURE

- Personal background
- Characteristics of our company
- Methodology of our company
- Hunting Zone
- The Process of Development of a New Product
- How the international cooperation can support Business and/or Product Development

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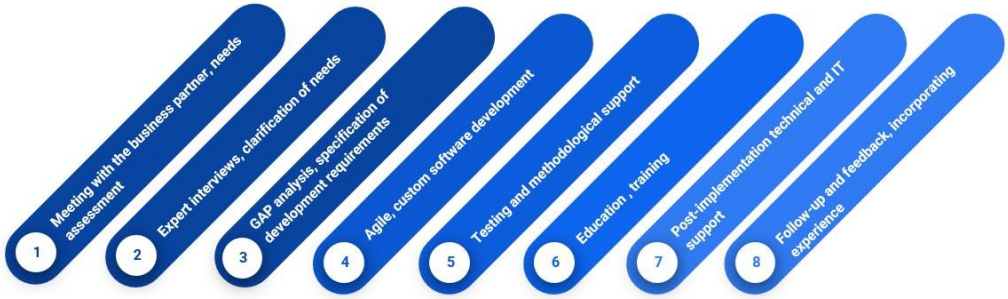
PERSONAL BACKGROUND

- Personal background
  - Research
    - Basic
    - Applied research
    - And experimental development.
  - Lecturing, teaching, training, coaching
  - Entrepreneurial activities

Characteristics of our company and

- **Name of the company** - **S**mart **P**roject **C**onsulting **I**nformatics Ltd., spin-off company
- **Year of foundation** - 2020
- **Address 1 Egyetem Tér, Building MC 114., Győr, H-9026, Hungary, website** - spci.hu
- **Number of employees** - 13
- **Professional Competences** - software development, database management and data mining, statistical and econometric analysis, modelling
- **Activities**
  - ***Services*** - Custom software development, Data mining and data visualization, Investment Appraisal, Risk management and project portfolio management, Mobile App Development, Surveying Consumer Preferences and Customer Satisfaction
  - ***Products and projects*** - Voter, agrostat.hu, Smart Project Portfolio Manager
- **Relationship with the Széchenyi István University**

Methodology of our company



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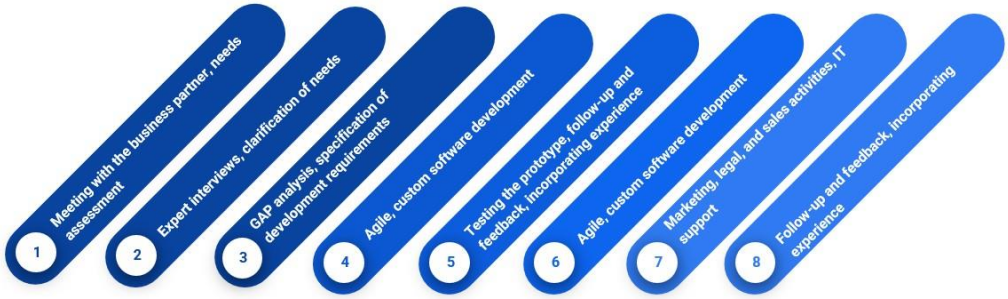
The Process of Development of a New Product



How an international cooperation can support Business and/or Product Development

- Meeting with the business partner, needs assessment
- Expert interviews, clarification of needs
- GAP analysis, specification of development requirements
- Agile, custom software development
- Testing the prototype, follow-up and feedback, incorporating experience
- Follow-up and feedback, incorporating experience

Thank you for your attention!

norbertkovacs@spci.hu

+36304843605

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5.9 Frank Doyle

Programme Director, Master's of Engineering in Digitalisation of Manufacturing, TUS, Ireland

REGIONAL UNIVERSITY NETWORK PLUS
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RUN-EU TRANSFER PATHWAYS TO PHD PRE-CONSULTATION PROCESS WITH SZE DOCTORAL PROGRAMME

Frank Doyle,
Lecturer in Electrical and Electronic Eng. Dept.
Co-ordinator for the Masters in Digitalisation of Manufacturing Programme.
Technological University of the Shannon: Midlands Midwest

Horizon 2020 European Union Funding for Research & Innovation
The content of this publication represents the views of the author only and is his/her sole responsibility. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains. Grant Agreement Number: 101005810.

TUS · POLITÉCNICO DE LEIRIA · HAMK · IPCA · NHL STENDEN · SZÉCHENYI EGYETEM · FHV Vorarlberg University of Applied Sciences

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PRESENTATION STRUCTURE

- Personal background / Research activities / Publications / Research plan
- The SZE Doctoral application process
- Consultation process
- An outline of the Comprehensive Exam, written & oral
- An overview of my planned research work and its projected timeline

PERSONAL BACKGROUND / RESEARCH ACTIVITIES

Lecturing in the Electrical Department with TUS Midwest, Limerick, Ireland

Senior Researcher at the Irish Digital Engineering and Advanced Manufacturing (IDEAM) Research Institute in TUS

Co-ordinating the Masters in Digitalisation of Manufacturing Programme.

Supervising Industry based Researchers at Masters level.

Research projects in collaboration with Industry in the plastics, medical device and precision engineering sectors in the development of sustainable energy solutions through digitalisation of equipment and processes for manufacturing.

Research work has focused on energy efficiency in manufacturing with the goal of effecting behavioural change for production optimisation and carbon reduction.

PUBLICATIONS

Covering the topics of Energy Efficiency in Industry and Digitalisation of Manufacturing.

ORCID ID - https://orcid.org/0000-0002-2866-9510

Article Title	Title of Journal	Date of publication
A Case Study Analysis of Energy Savings Achieved Through Behavioural Change and Social Feedback on Manufacturing Machines	Sustainable Design and Manufacturing 2019	2019
Steps towards digitization of manufacturing in an SME environment	Procedia Manufacturing	2019
A Review of Interoperability Standards for Industry 4.0	Procedia Manufacturing	2019
A case study on the analysis of an injection moulding machine energy data sets for improving energy and production management	eceee Industrial Summer Study 2018	2018-07
Machine level energy data analysis – development and validation of a machine learning based tool	eceee Industrial Summer Study 2018	2018-07
An approach to optimising compressed air systems in production operations	International Journal of Ambient Energy	17/02/2018
A methodology for electricity monitoring and targeting (M&T) in an Irish precision engineering SME	International Journal of Sustainable Engineering	03/09/2017
A methodology for verified energy savings in manufacturing facilities through changes in operational behaviour	Eceee Industrial Summer Study Proceedings	2016-07
An Approach to Electricity Monitoring and Targeting (M&T) in Irish Precision Engineering SME	Sustainable Design and Manufacturing 2016	2016
Design of an Embedded Sensor Network for Application in Energy Monitoring of Commercial and Industrial Facilities	Energy Procedia	2015-12
A methodology for determining auxiliary and value-added electricity in manufacturing machines	International Journal of Production Research	02/09/2015

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RESEARCH PLAN

The proposed research will focus on how **data** relevant to optimization of operations and processes may be obtained in **regulated manufacturing environments** in a manner which is acceptable within the confines of existing regulations.

Operational technology (OT) and Information Technology (IT) are critical elements in discrete and batch processing manufacturing operations. However access to actual production equipment and resulting data streams is controlled and tightly restricted.

Continual and successful operation of manufacturing processes require effective maintenance of equipment. To understand system behavioural characteristics at various stages of operations of production entails relevant data capture and analysis to associate production activities and potential failure events.

Regulatory requirements and IT security concerns **restrict** the deployment of computing equipment in the workplace thus **alternative** methods are needed to capture the data required.

RESEARCH PLAN

While control recipes used by Programmable Logic Controllers (PLC's) are understood to be Operational Data and thus protected, the actual live data tags on PLC's are seen as Factory data and separate from protected data and thus seen as useable in the quest for independent intelligent analysis of systems.

Linking this data source with additional sensor (current, vibration, environment) data can make it possible for 5G connected Edge devices to deploy machine learning to update Cloud based Dashboards with advanced knowledge of potential failure of components such as seals and bearings on critical equipment.

This PhD proposal aims to investigate a new approach which integrates data from multiple sources of control data (PLC, motors, drives) and additional sensors (current, vibration, environment).
This will allow generation of time series profiles of processes to monitor run-in sequences for critical bearings in a manufacturing process.

It aims to estimate remaining useful life (RUL) of bearings, and predict bearing failures in order to avoid catastrophic failures, loss of batch and consequential downtime.

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THE SZEEDS^{M} DOCTORAL PROGRAM IN BUSINESS ADMINISTRATION WITH A TRANSDISCIPLINARY APPROACH

This program is based in the Széchenyi University in Gyor Hungary.

It provides an English-language mediated education offering two specializations in the doctoral training.

The Management Specialization focuses on various fields of business administration.

The Transdisciplinary Specialization aims at opening novel perspectives on current issues in business administration under complex economic and social circumstances by directing attention to problem solving and decision making.

The ideal incoming cohort has Master's Degrees in relevant fields, appropriate level of work experience and excellent verbal and written communication skills in English.

The Call for Applications can be found at https://szeeds.sze.hu/szeedsm-call-for-applications

SZE DOCTORAL APPLICATION PROCESS

Items required to be submitted for the application include the following:

- Copy of university degree
- Professional CV,
- List of publications,
- Research plan (max. 4000 character spaces)
- Half-page long cover letter
- Letters of recommendation (from a teacher, workplace manager, a professional, etc.),
- Foreign Language Proficiency of two languages
  Certificates (state-recognized medium "level B2") can be accepted of the following languages: English, German, French, Italian, Russian, Latin, Spanish.

CONSULTATION PROCESS

After completing the Application process I was invited to visit the University.

Meeting with Professors from the Department including the Director of the Doctoral Program.

- Research background
- Finding the gap in Research
- Proposed research plans
- Comprehensive Exam process - Written / Oral

Tour of University and Research Laboratories

Regular consultation with the Program manager was available to provide guidance on the application process and the Comprehensive Exam.

COMPREHENSIVE EXAM (COMPS)

The **COMPS** https://szeedsm.eu/comprehensive-exam consists of two exams.

1. **Theoretical** - written part

   In the written exam the applicants will give evidence of their background knowledge.

   The aim is to verify that candidates have the necessary foundations in the knowledge background and research methods which will enable them to pursue and develop their research.

   Candidates are given 8 questions from a previously published list of twenty questions.

   Selecting 4 of these questions provides an opportunity to demonstrate an understanding of the topic and how the concept or premise may or may not apply to the proposed research.

COMPREHENSIVE EXAM (COMPS)

2. The **Oral part**

   This is an interview with the COMPS Committee which will take place shortly after the written test . COMPS 'interviews' are free-flowing conversations, lasting up to an hour per applicant.

   The COMPS Committee is eager to know how the applicant can give account of their

   - Literature studies,
   - Choosing journals for their new ideas and contributions,
   - Research design to support quantitative and qualitative data analyses in the post-COMPS period and
   - Any foreseeable limitations for their research.

COMPS - STUDENT ASSESSMENT II SUBMISSION

- The Student Assessment II submission and its reviews will be given to the COMPS Committee members before the oral part of the COMPS where a discussion about this submission will be held.
- Applicants who are applying to the program via COMPS are expected to submit an extended abstract (1400 words, approximately 7×200 words).
- The template of the extended abstract is as follows:
  1. Problem scope
  2. Gap in literature
  3. Purpose
  4. Research Design / data collection and analysis
  5. Overview of the main result(s)
  6. Originality of finding(s) and argument(s)
  7. Limitations.

CURRENT RESEARCH PLAN

My research plan has evolved towards the investigation of a real-time sensing solution (including acoustic emissions) for monitoring industrial parameters and providing decision support for maintenance and operation functions in a pharma plant.

If successful the approach will have potential for further deployment in other manufacturing sectors such as the food industry

Month	2	4	6	8	10	12	14	16	18	20	22	24
Review of Existing research												
Conference Publication												
Design Methodology and Tools integration												
Journal Publication												
Industrial Case study												
Journal/Conference Publication												
Review of Existing research												
Results and Conclusion												
Journal Publication												
Presentation of Thesis												

5.10 Tania Marsh

Research Integration Project Manager, TUS, Ireland

TUS

The Application and Accessibility of Open Science to Business and Society

Tania Marsh
Research Integration Project Manager
@tania_marsh13
https://orcid.org/0000-0003-0171-9968

Topics covered

- What is Open Science?
- What is Open Access?
- Why publish Open Access & What are the benefits?
- How do I publish Open Access?
- Do I have to?

What is Open Science?

Open Science Definitions

- "Open science refers to a new approach to the scientific process based on cooperative work and new ways of disseminating knowledge, improving accessibility to and re-usability of research outputs by using digital technologies and new collaborative tools" (European Commission, 2018a)
- "Open Science is transparent and accessible knowledge that is shared and developed through collaborative networks" (Vicente-Saez y Martínez, 2018)
- "Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods" (FOSTER)

UNESCO Definition

- is an inclusive construct that combines various movements and practices
- to make multilingual scientific knowledge openly available, accessible and reusable …
- to increase scientific collaborations and sharing of information
- for the benefits of science and society …
- It comprises all scientific disciplines … and scholarly practices,
- it builds on the following key pillars: open scientific knowledge, open science infrastructures, science communication, open engagement of societal actors

https://en.unesco.org/science-sustainable-future/open-science/recommendation

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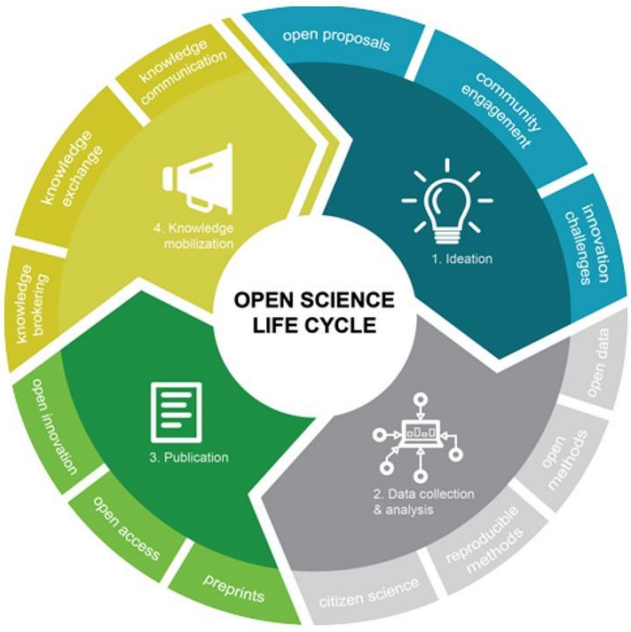
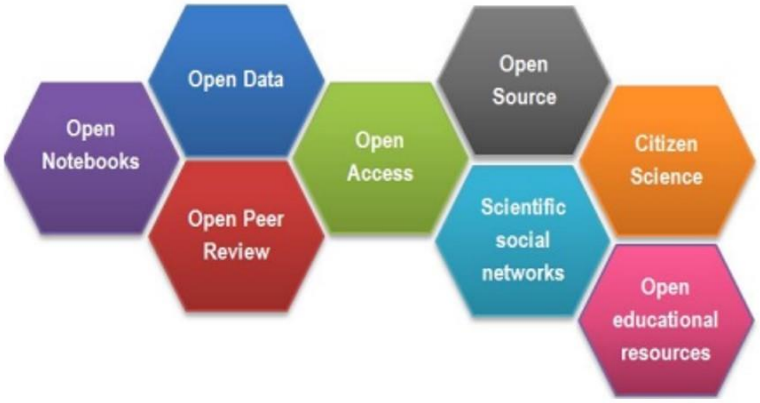


The open science life cycle includes:

- Tackling innovation challenges and engaging the community during ideation
- Encouraging citizen science and integrating open methods and open data during data collection and analysis
- Encouraging access to publications prior to peer review (preprints) as part of the publication process
- Using open access publications to exchange and communicate data and information during the final stage of knowledge mobilisation

https://science.gc.ca/site/science/en/open-science-helping-make-science-accessible-all-canadians

An ecosystem comprising of many ‘parts’



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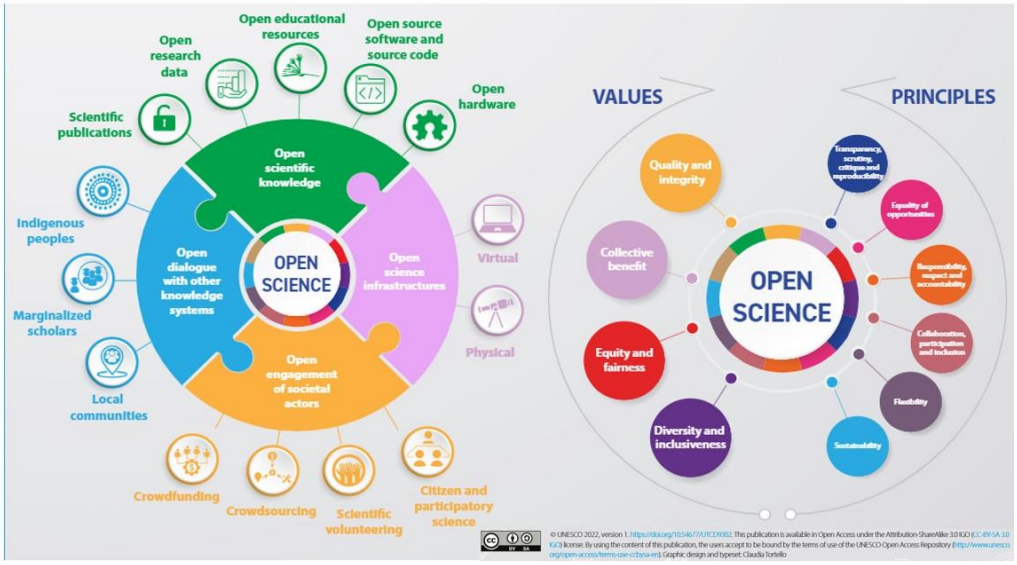
UNESCO recommendation on Open Science at a Glance



What is Open Access?

What is Open Access?

Open Access (OA) is a publishing and distribution model that makes scholarly research literature (articles, book chapters, data, etc.) freely available online, allowing unrestricted access with no reading or subscription fee, sometimes after an agreed period has elapsed since initial publication.

It complements and extends the established practices and rigorous selection of publications in peer reviewed journals and elsewhere, operating in parallel with conventional publication channels.

Tip: Install Open Access Browser Extension and/or Unpaywall browser extension

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History of Open Access

The term "open access" was first coined in three public statements in the 2000s:

- Budapest Open Access Initiative in February 2002,
- Bethesda Statement on Open Access Publishing in June 2003,
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in October 2003.

However, in practice it dates back much further

- 1971: Project Gutenberg – 60k+ free, public domain text file eBooks
- 1983: GNU Project – MIT, free software license (NU stands for Not Unix)
- 1991: arXiv – “Archive”, holds over 1.9m eprints, hosted in Cornell

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Why OA? What are the benefits?

Open Access provides several advantages over traditional scholarly publication methods:

- Eliminates inequalities in access to knowledge
- Greater Exposure - discoverable via search engines such as Google Scholar
- Faster transmission - preprints
- Greater impact of scholarship
- Higher citation counts for authors *(47% citation advantage)*
- Long term preservation of work
- Gives the taxpayer access to tax-funded research – supporting/enabling citizen science
- Enhance research reputation
- Enables and encourages interdisciplinary approaches to research

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Open science allows you to benefit from current scientific findings. It increases efficiency and quality of research, allows for an expansion of innovation, and escalates collaboration.

Efficiency: Increased access to publications and journals can reduce the duplication of research and the cost of creating and reusing data. It allows others to build and expand on prior work without repeating the same information.

Quality: Due to a wider evaluation, open science makes research more reproducible, allowing for more replications and validations of data. This helps alleviate the issue of manipulation of data.

Innovation: Open science provides individuals with an increased access to research, which in turn, leads to more innovation of new products and ideas.

Collaboration and Societal Benefits: Increased access to research and publications allows for an increase in national and global collaboration. This speeds up the transfer of knowledge and assists in addressing issues that require a wider range of attention and collaboration – for example, global warming.

https://blog.theopenscholar.com/en/open-science-purpose-benefits#:~:text=Open%20science%20allows%20you%20to,of%20innovation%2C%20and%20escalates%20collaboration.&text=Increased%20access%20to%20publications%20and,of%20creating%20and%20reusing%20data.

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How do I publish Open Access?

- Green Open Access
- Gold Open Access
  - Transformative Agreements

Green Open Access

Green Open Access publishing refers to the **self-archiving** of published or pre-publication works for free public use.

Authors provide access to a version of their publication (with publisher permission) via an institutional repository such as Research@THEA or a subject specific repository.

OpenDOAR, is the 'authoritative directory of academic open access repositories', you can be confident it meets funder requirements on open access if registered here.

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What version can I make OA?

- Most journal publishers allow the self-archiving of the Authors Accepted Manuscript with an embargo period attached to the conditions.
- Sherpa Romeo (aggregates and analyses publisher open access policies from around the world and provides summaries of publisher copyright and open access archiving policies on a journal-by-journal basis). Information from here should be double checked against the policies of individual journals as policies change over time. If at all unsure, please contact the library for guidance.

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Terminology can vary from publisher to publisher; the table below should help you to decide which version is necessary for your particular needs.

Version Stages	Definition	Alternative terms
Submitted Version	The version originally submitted to the journal before peer review process and corrections	Preprint, Author's original draft
Accepted Version	The accepted version, after peer review but prior to the final publishers copy-editing and layout	Postprint, Accepted Manuscript, Author's Accepted Manuscript
Published Version	An exact digital replica of the published article	Postprint, Version of record, Final version, Publisher's version

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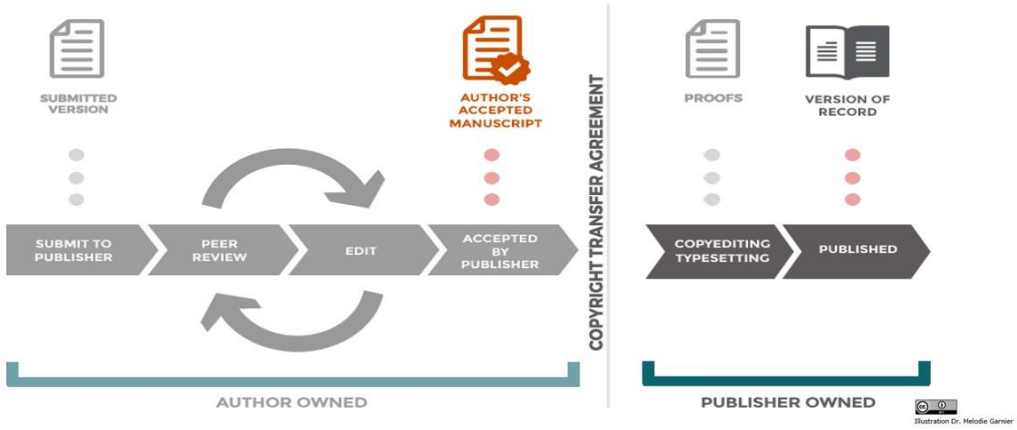
Act on Acceptance

Deposit in Institutional Repository; Research@THEA



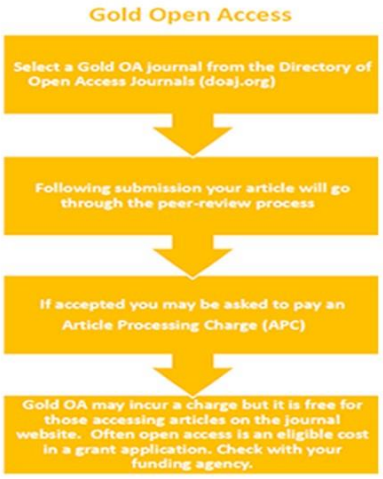
Gold Open Access

Publish article Open Access in a journal, sometimes for a fee, known as an "article processing charge" or "APC".

The journal may be exclusively Open Access, or it may have a mixture of Open Access and subscription-only articles. These are referred to as HYBRID journals.

The publisher makes the final version of record article freely available (OA) **immediately upon publication**.

The cost of publication is usually covered by a one-off fee, an article processing charge / APC, paid by the author. The average cost of an APC is approx. €2,000 per paper (ex. VAT at 23% in Ireland, goods VAT elsewhere).

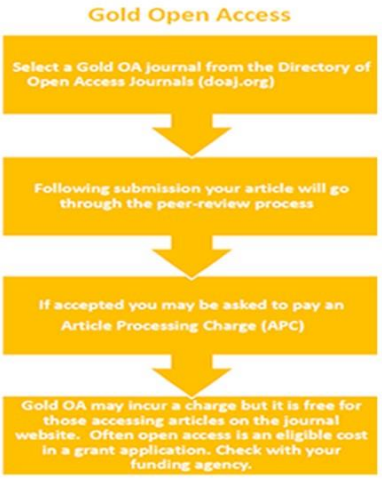


Gold Open Access

APCs vary from journal to journal, covering the entire cost of the publication process e.g. peer-reviewing, editing, publishing, maintaining and archiving, and allows immediate access to the full text versions of the research articles.

APCs for open access is often an eligible cost in a grant application. The Budget for Publications = Average APC x number of expected publications

DOAJ: Directory of Open Access Journals
An online directory that indexes and provides access to high quality, open access, peer-reviewed journals.



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Transformative Agreements/Read & Publish Agreements

"Transformative agreement" is an umbrella term describing those agreements negotiated between institutions (libraries, national and regional consortia) and publishers in which former subscription expenditures are repurposed to support open access publishing of the negotiating institutions' authors, thus transforming the business model underlying scholarly journal publishing.

NB: Always check with your library what local open access policies & agreements are in place.

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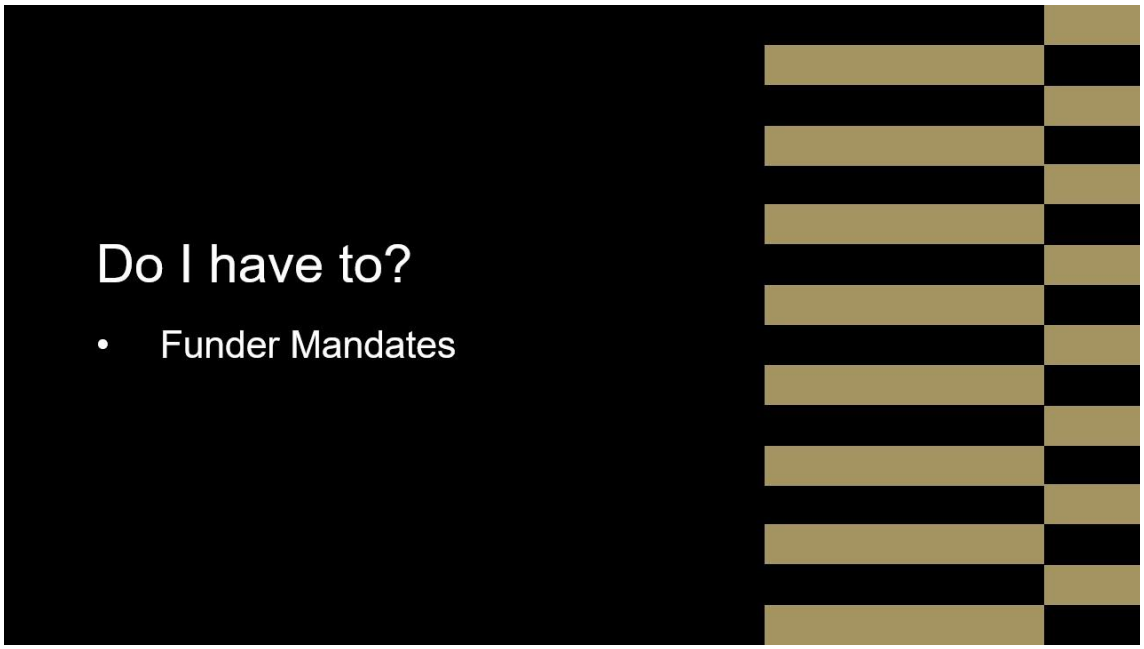


Funder Mandates

The following are just some of the funding agencies have open access requirements pertaining to publications arising from your research and, increasingly, your data:

- European Commission Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020
- European Research Council (ERC) Open Access Guidelines for researchers funded by the ERC
- Horizon Europe

Many National funders have mandates in place – always check when applying for funding so you can 'build in' the cost of OA publishing

- Sherpa Juliet – "searchable database and single focal point of up-to-date information concerning funders' policies and their requirements on open access, publication and data archiving."

RUN-EU PLUS is organising an **Online Workshop on Introduction to Open Science** in January 2023.

Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable the reuse, redistribution and reproduction of the research and its underlying data and methods.

The movement is becoming more relevant due to the demand for transparency in the code of conduct and the demands of funders.

Workshop on Introduction to Open Science

18 January 2023 · 13h00-14h30 CET

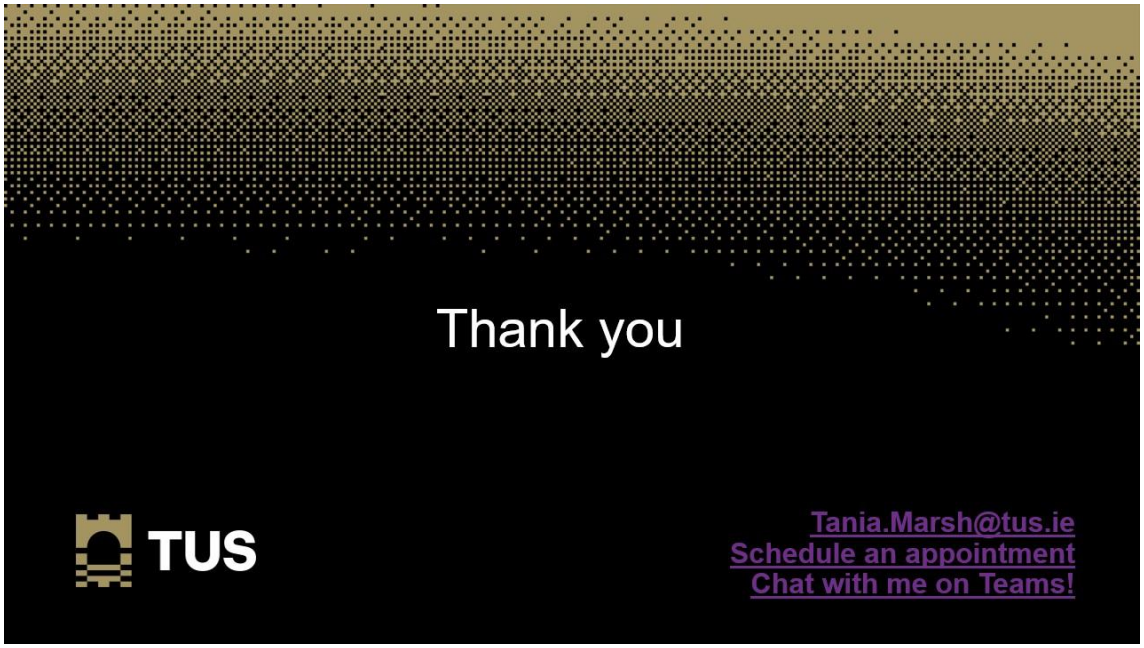
The workshop on Introduction to Open Science will focus on:

- Definition of Open Science
- The importance of Open Science in each research phase
- Open Science in the European Union
- Open Science in the RUN-EU universities

It is open to all RUN-EU researchers and students and will take place via MS Teams.

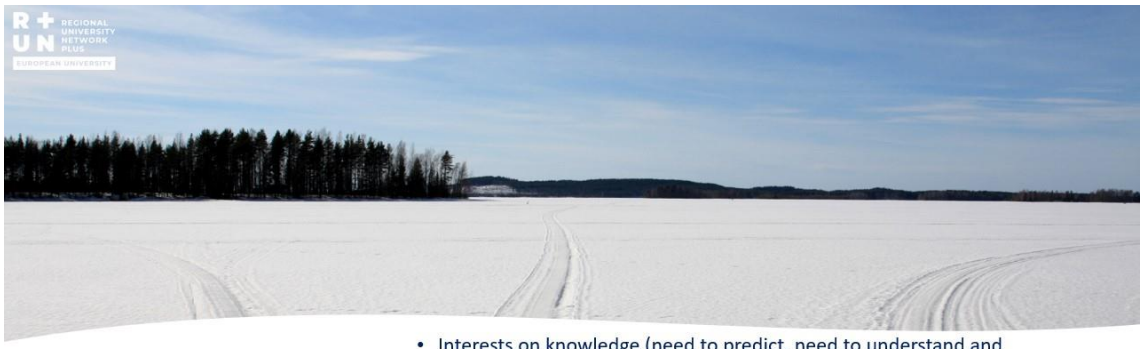
REGISTER BY 17 JANUARY

REGISTRATION NOW OPEN – **CLICK HERE**



5.11 Dr Virve Kallioniemi-Chambers

Education Development Specialist, HAMK, Finland



RESEARCHERS' CONTINUING LEARNING

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- Interests on knowledge (need to predict, need to understand and interpret, need to find critical approach, etc.):
  - RUN-EU: practice-based research, citizen science, participatory, empowerment of people, innovations, etc.
  - RUN-EU : regional – international dimension
- Also, the research process is undergoing 1) digital transformation and is becoming 2) less linear and 3) more collaborative and open, and 4) more multidisciplinary with a larger diversity of outputs (EU report Towards a Reform of the Research Assessment, 2021).

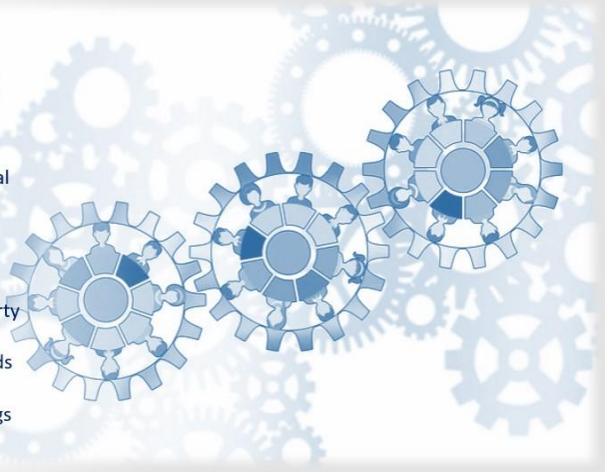
➡ Researcher career development training programme?

Virve Kallioniemi-Chambers 14.12.2022

REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

PRACTICE-BASED RESEARCHER, SOME CHALLENGES TO FACE

- **Acting both in academic and non-academic context! (temporal aspect!)**
  - **Organisational cultures**, sometimes cultural shock
  - Information and knowledge from **many sources**
  - Lack of knowledge **on the career paths**
  - **Different practices**, incl. intellectual property rights
  - **Company's** needs – **global** trends and needs – **scientific knowledge**
  - **Different concepts** used in different settings
  - How to cope with the **uncertainty**, **uniqueness** and potential **conflicts** in different environments?



Virve Kallioniemi-Chambers 14.12.2022

RUN-EU RESEARCHERS, SKILLS AND COMPETENCES

E.g.,

- Skills to **build bridges** between different actors in collaboration,
- abilities to undertake **transnational cross-networking** between researchers and stakeholders,
- abilities to **construct knowledge** and **research practices in different environments**,
- skills to **integrate the knowledge from different sources** and **communicate it** to different kind of collaborators
- abilities **to form research questions**,

- abilities **to face uncertainty** in research environments,
- skills **in business and innovation practices**,
- possess **a co-creative and experimental approa**ch,
- skills **to identify and understand context**,
- skills to **take local-global approaches to the phenomeno**n under investigation (skill sustainability),
- best practice in **open science and citizen science** are familiar to the researcher,
- abilities to pay attention on the **wellbeing** of themselves others and an increase in awareness of good practice in promoting equality in the research community,
- abilities to plan their **career paths!**

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Virve Kallioniemi-Chambers 14.12.2022

Strengthening Human Capital

RUN-EU PLUS
Researcher Career Development Framework Programme

Informed by:
1. RUN-EU PLUS grant agreement (promises made)
2. EU reports (EURODOC)
3. RUN-EU PLUS audit and gap analysis
4. Researcher consultation (9 June registration questions & breakout sessions)

Annual Programme

Theme 1 Research skills	Theme 2 Transferrable skills	Theme 3 Career Development
• Research methodologies • Research integrity • Research ethics • Academic writing • IP management • Open Science • Data Analysis	• Communication • Practise-based thinking • Intercultural awareness • Well being • Time Management	• Project management • Funding applications • Report writing • Mobility • Career planning/evaluation • Skills gap identification • Teaching/supervision • Enterprise

Researcher tools: Researcher career evaluation system & Cloud of Knowledge Portal

Existing researcher skills training programmes across RUN-EU

New researcher skills training programmes across RUN-EU

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REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

RESEARCHER CAREER DEVELOPMENT

TRAINING PROGRAMME 2022

1.JUNE
OPEN SCIENCE WORKSHOP ON OPEN ACCESS
13h00-17h00 CET

2.JUNE
OPEN SCIENCE WORKSHOP ON FAIR DATA
13h00-17h00 CET

9.JUNE
ATTRACTIVE RESEARCHER CAREER PATHS
10h00-16h00 CET

6.SEPTEMBER
HOW TO BE A SUCCESSFUL RESEARCHER
10h00-16h00 CET

20.SEPTEMBER
APPROACHES TO EARLY-STAGE RESEARCHER SUPERVISION
10h00-16h00 CET

REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

RESEARCHER CAREER DEVELOPMENT EVALUATION TOOL

- Evaluation in RUN-EU, focus NOT just on the publications!
- researchers possess the tools and channels available to them which they can use for improving their skills to undertake their own research **skills self-assessment** and **learn to develop their career paths and training** according to their identified needs.

-> CONTINUING, INTERESTING, COLLABORATIVE LEARNING PROCESS ☺

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RUN-EU researcher career evaluation tool:

- supports **researchers' career development on all researcher career stages,**
- support researchers' competences especially in the **features of practice-based research**; team performances! emphases the quality of work! Open Science!
- supports the development of RUN-EU researcher **recruitment and collaboration practices**,
- supports **the trainers** of RUN-EU researchers to plan and implement their training based on the general objectives of RUN-EU,
- supports the assessment and development of the RUN-EU **researcher training programme content, practices, and the quality.**

Virve Kallioniemi-Chambers 14.12.2022

Thank you!
Kiitos!

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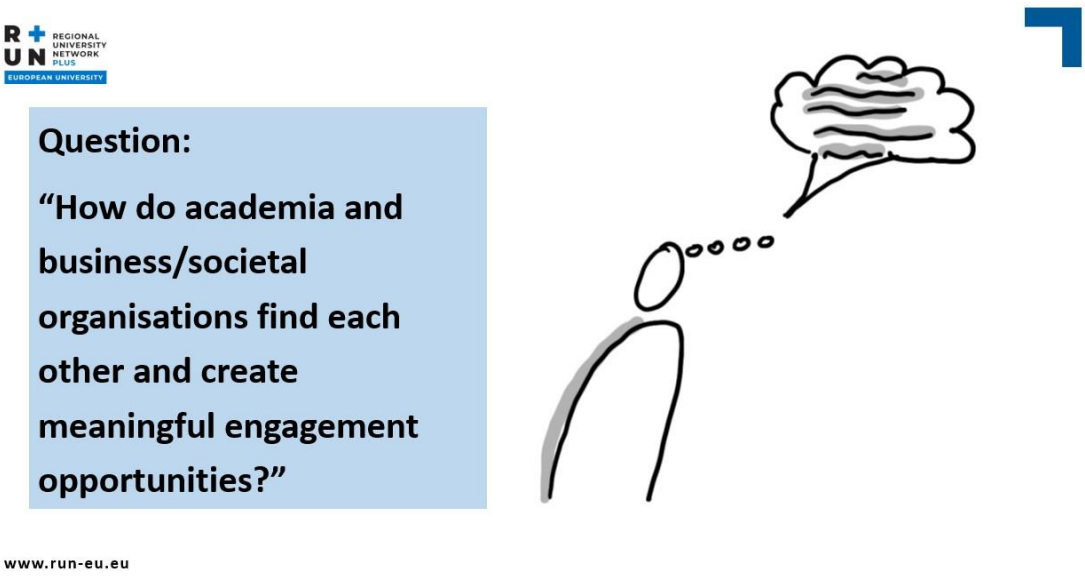
5.12 Dr Markus Preißinger

Head of Research, FHV, Austria

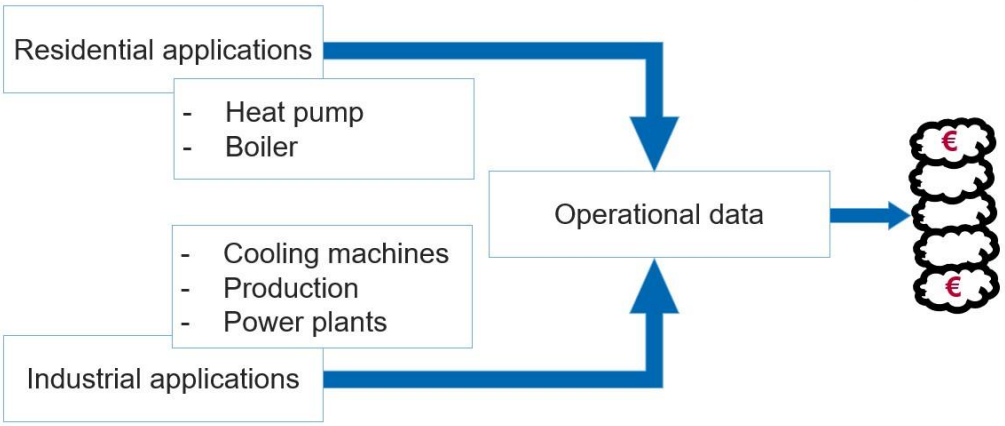


1) Academia has to foresee the problem

2) Academia has to take care of bureaucracy

SEEING PROBLEMS

LOCAL OPERATIONAL DATA



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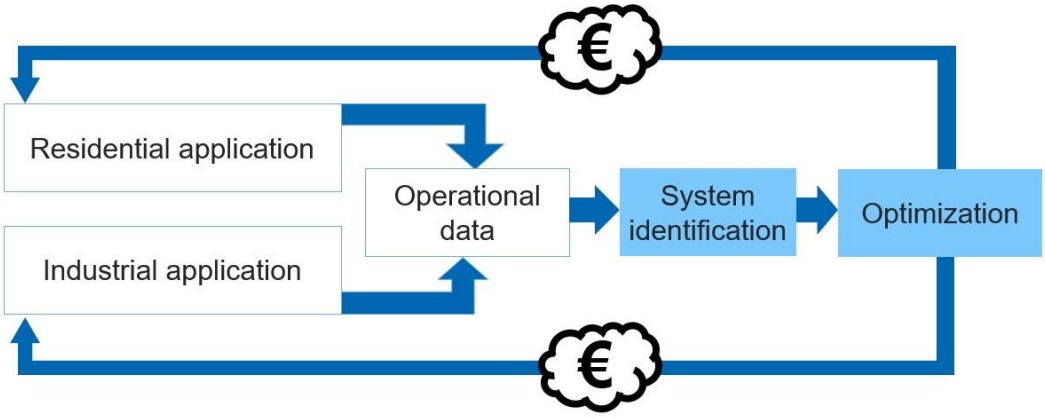

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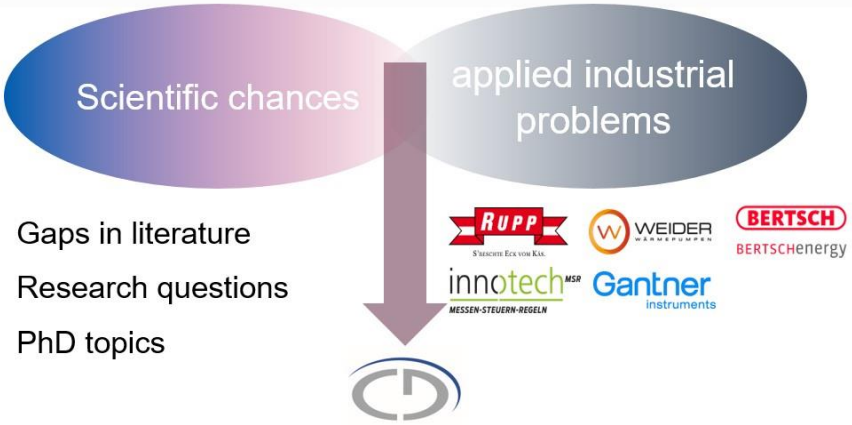

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TAKE OVER BUREAUCRACY

COMPETENCES WITH/FOR INDUSTRY

EFRE:

Industry of the future – data-based, energy efficient, sustainable

COIN:

Lab for Accelerated Lifetime Testing

CDG:

Josef Ressel Center for Intelligent Thermal Energy Systems

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OVERALL SUMMARY

Markus, you nailed our problem and you promised that we don‘t have to write working hours – where can we transfer the money?

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R+UN REGIONAL UNIVERSITY NETWORK PLUS
EUROPEAN UNIVERSITY

THANK YOU!

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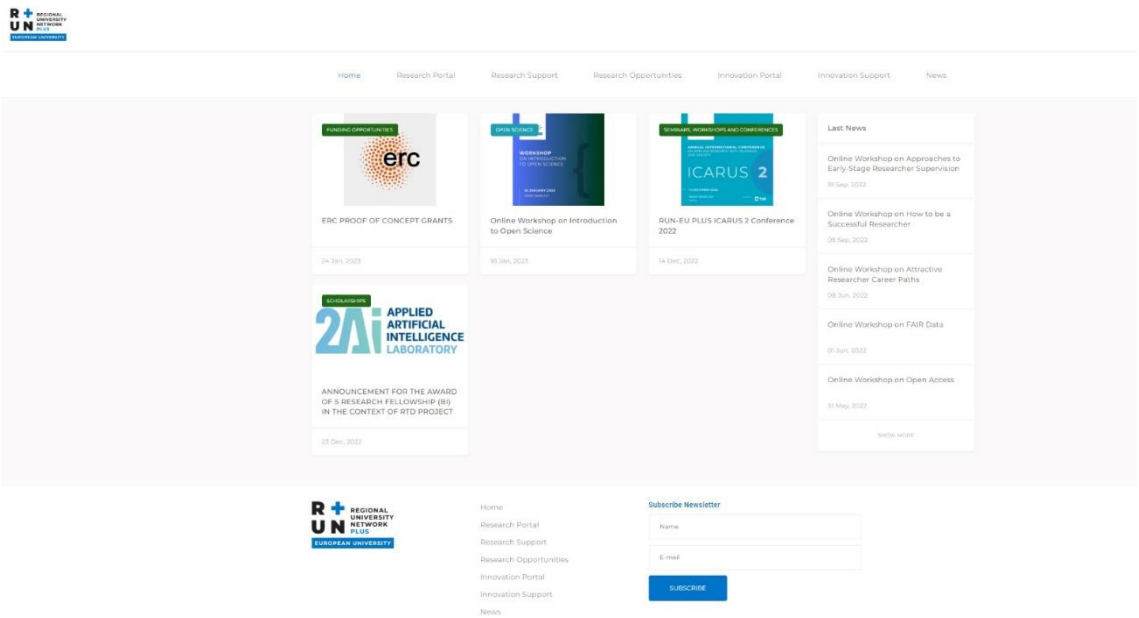
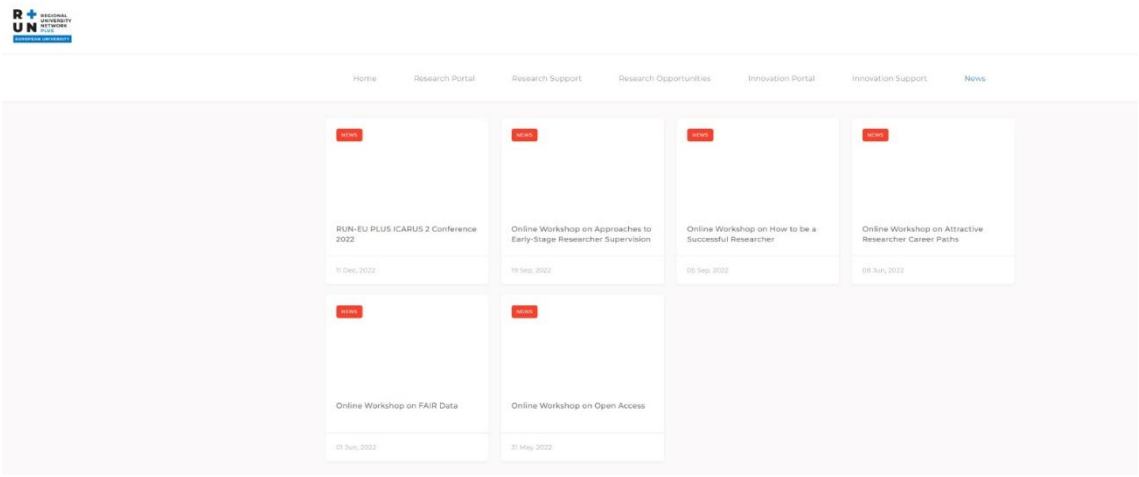
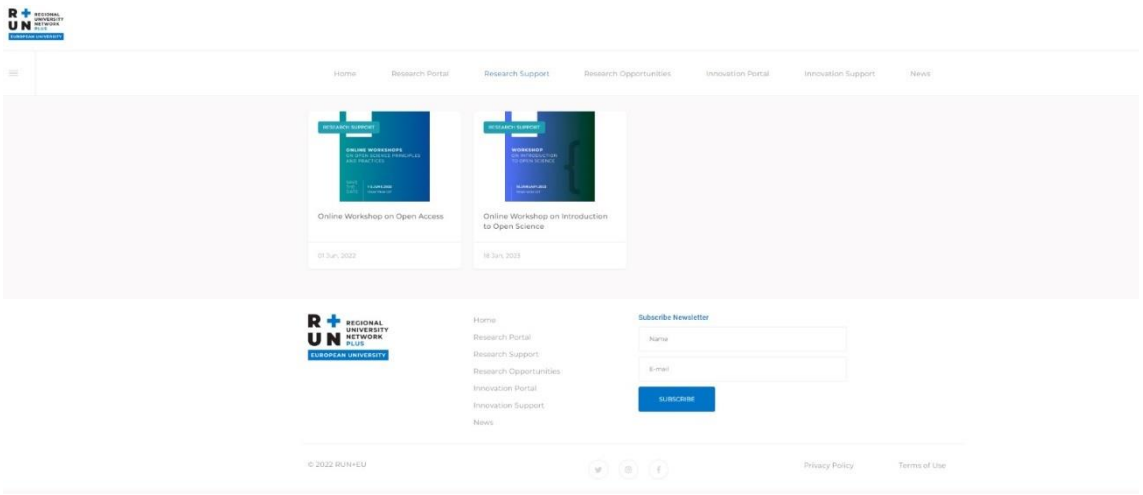
5.13 Dr João Vilaça

Head of Research, IPCA, Portugal

- RUN-EU PLUS Cloud of Knowledge Portal demonstration



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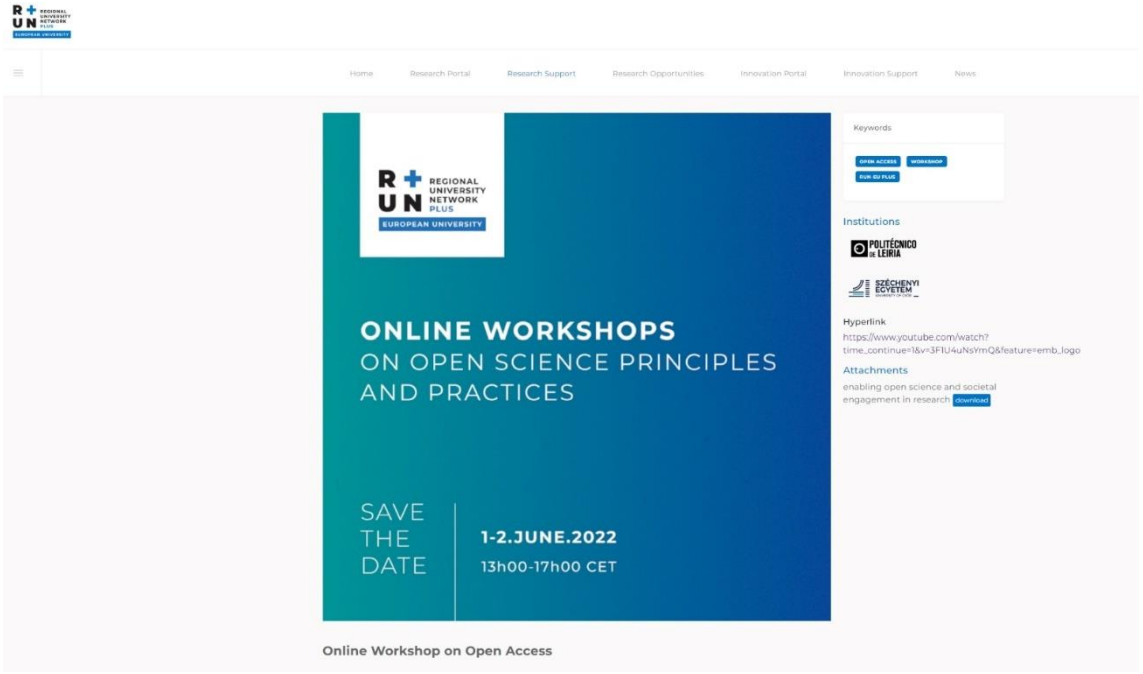
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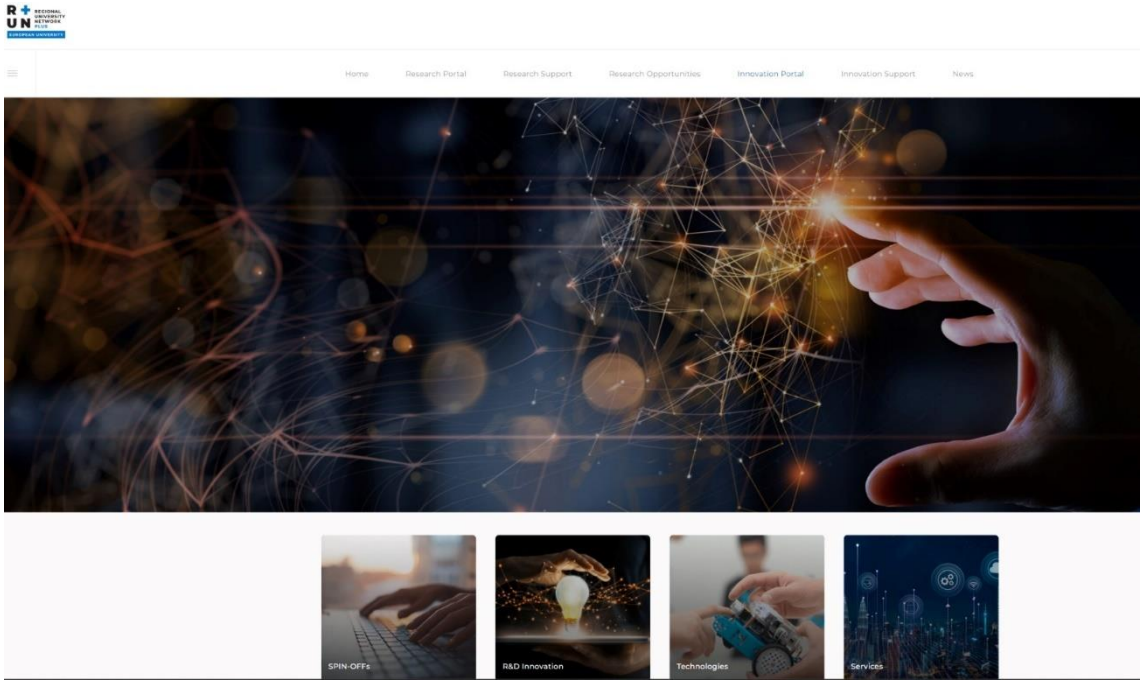
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6.0 Participant Feedback

All ICARUS 2 attendees were invited to provide feedback via an online questionnaire which was made available to them throughout the duration of the ICARUS 2 conference, and which was also circulated to them upon its completion.

As the invitation to provide feedback on the conference is still open, the feedback presented here is preliminary and a complete report on the feedback survey will be presented in RUN-EU PLUS Deliverable 2.7 Quality Assessment and Monitoring Report – 2nd report which is due M24 (30th September 2023).

To date, a total of 64 responses were received. Overall, the responses were very positive with the majority (95 %) of conference attendees either in strong agreement or in agreement that the conference objectives were clear and useful. **Image 2** presents these findings.

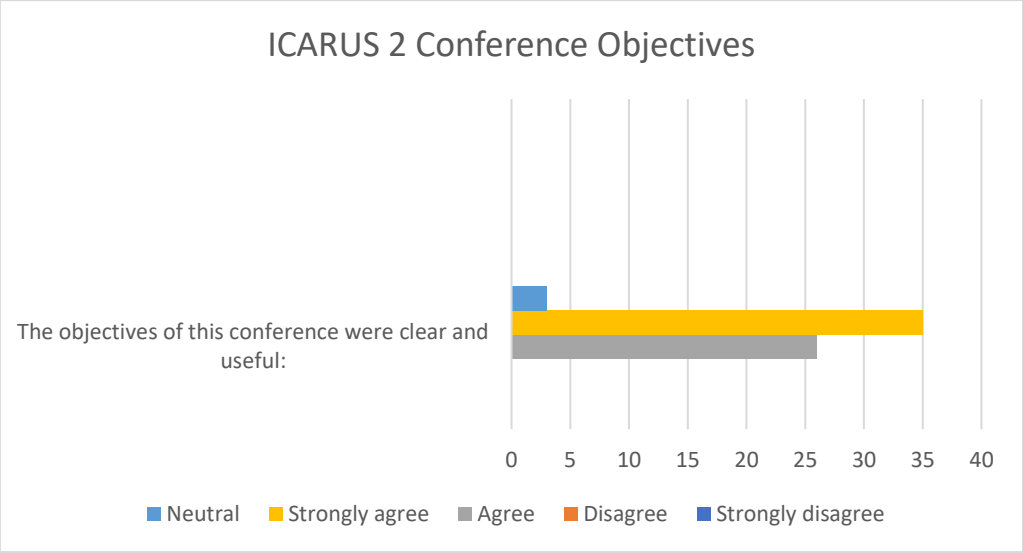


Image 2- Preliminary feedback on RUN-EU PLUS ICARUS 2 conference objectives

Image 3 presents the preliminary results pertaining to the satisfaction of conference attendees with the information that was provided by presenters during the ICARUS 2 conference. Once again, the responses were very positive with 53 attendees (83%) believing that the information provided was 'just right', 8 attendees (12.5 %) believing that it was too advanced and only 3 (4.5 %) finding it too basic.

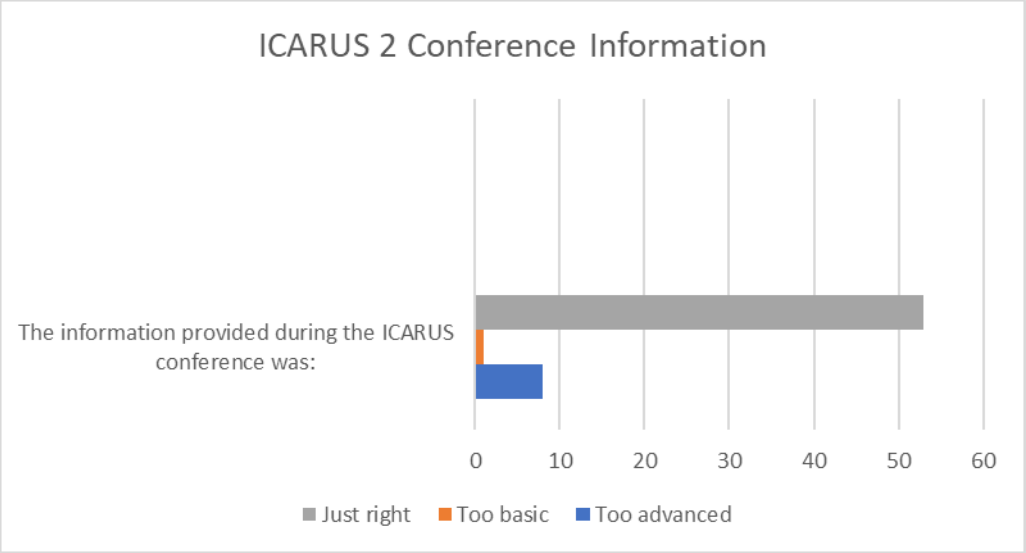


Image 3- Preliminary feedback on RUN-EU PLUS ICARUS 2 conference information

Table 1 provides insight into the personal opinions of attendees when invited to provide feedback on what they liked most about the ICARUS 2 conference. In summary, attendees believed that the conference was well organised, and the atmosphere was relaxed and friendly. In addition to the variety of topics covered, attendees appreciated the research experience which the presenters brought to their presentations as well as the personal experiences which they shared. Attendees also pointed to the fact that the conference provided them with insight into the opportunities provided by RUN-EU PLUS to them, such as mobility.

Table 1- Preliminary feedback on RUN-EU PLUS ICARUS 2 conference – individual feedback

Attendee responses on what they liked most about the ICARUS 2 conference	
• Diversity of topics and scope • Hearing about how other people engage with RUN-EU • The presentations and the smile of everyone • Multiple international presenters across the RUN-EU Alliance • Knowing what other projects different RUN-EU universities are working on for a better picture of RUN-EU PLUS • Brought a number of research environments to the fore • Hearing personal stories of researchers • PhD opportunities • I liked the fact that most of the presentations had an industry-based perspective • There was excellent variety and a good balance between technical and general information • The presentation of on-going work • Sharing experiences • The chair and real research experiences shown • The conference offered a variety of topics, and the presenters were straight to the point • Very informative and well structured	• It was very useful to understand the type of mobility research experiences that already took place • The case studies of practice-oriented research engaging business industry and health care sector • The possibility to hear presentations from different actors' point of view • Professional, yet friendly atmosphere • Hearing other experiences, practical approaches, learning from others experience and gaining institutional knowledge • Well-organized conference, dynamic working • The excellent and insightful presentations • Hearing how other lecturers/researchers got up and running with PhD students • Relevant researchers with resounding achievements • The different aspects of researcher mobility/business cooperation • Engagement of the presenters and the applicability component on business and society

As stated previously, the feedback presented here is preliminary and a full, in-dept report will be provided in RUN-EU PLUS Deliverable 2.7 (Quality Assessment and Monitoring Report – 2nd report) which is due M24 (30th September 2023).

7.0 ICARUS 2 Dissemination article

RUN-EU PLUS ICARUS 2, December 2022

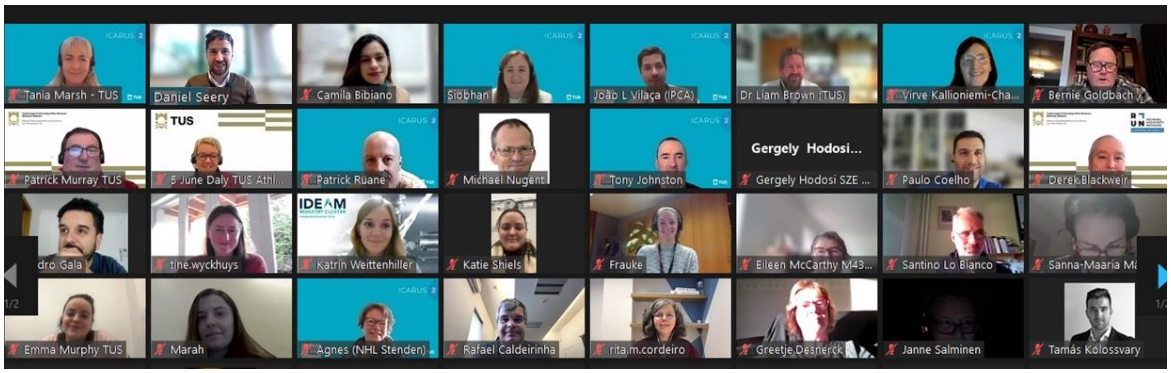
On 14th December 2022 TUS hosted the second iteration of the ICARUS 2 conference as part of the RUN-EU PLUS project, chaired by Dr Siobhán Moane the project manager. The conference was hosted online on the Zoom platform and attended by delegates from all RUN-EU partners, including TUS, NHL Stenden, The Polytechnic of Leiria (IPL), Häme University of Applied Sciences (HAMK), The Polytechnic of Cávado and Ave (IPCA), University of Győr – Széchenyi István University (SZE) and The Vorarlberg University of Applied Sciences (FHV). We were also delighted to extend a special welcome to our new partners from the University of Burgos (Spain) and Howest University of Applied Sciences (Belgium), alongside many industry and society partners, and postgraduate researchers.

A packed agenda saw 13 papers presented covering current research projects including tourism, engineering, and social sciences. Good practice case studies included presentations on professional employment practice-based PhDs, Open Science, Researcher mobility and joint PhD supervision. The session was closed with a presentation from Dr. João Vilaça (IPCA) introducing the RUN-EU PLUS "Cloud of Knowledge" Portal which will go live in 2023.

In his opening remarks, President Vincent Cunnane (TUS) remarked that "The RUN-EU PLUS initiative plays a crucially important role in driving the research and innovation of our RUN-EU agenda and in educating researchers with the future skills required by our regional partners for their long-term strategic development. RUN-EU PLUS will enhance RUN-EU collaboration with and for society through the development and deployment of collaborative professional practice-based research degrees across the alliance."

292 delegates registered for the conference, increasing the attendance against the 2021 iteration, with strong attendance throughout the day. Feedback was gathered on MS Forms with

attendees reporting high levels of satisfaction with the new knowledge presented the level of complexity of the papers and the opportunity to learn about the various RUN-EU PLUS initiatives.



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