



Members' Newsletter – March 2022

TE2022 Conference Update (Jul 5-8, 2023 @MIT)

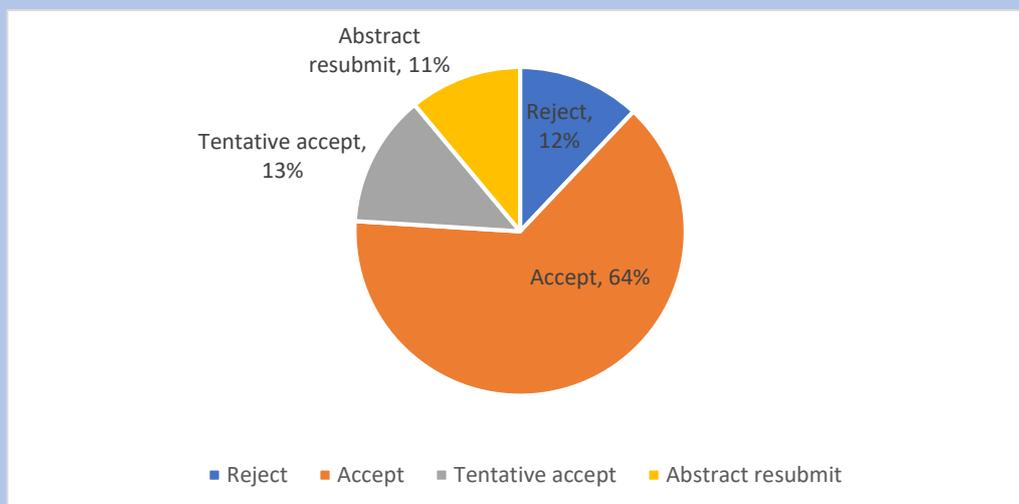
<https://te2022.org>

The TE2022 Conference Committee, MIT Conference services, and a new Student Committee have been busy preparing for our conference at MIT in Boston. 143 paper proposals (abstracts) were received from 23 countries. Scored by five members of the conference committee, 64% of these abstracts were accepted outright, and another 24% were accepted with guidance and resubmission. Six keynote speakers have agreed to join us, and a nice collection of workshops have been proposed. Three panels are being organized.

The deadline for first full paper versions was extended to March 25th. The Program Committee will kick off at the end of this month to begin the review process.

The Student Committee from several Boston area universities is considering community building activities, including site visits and dinner out in small groups. We are currently planning for 120 to 150 attendees, with the possibility that on certain days attendance will grow to 200.

Good luck to all in submitting their first full paper draft. The registration website will open up around March 25.



ISTE Membership

Our community continues to grow. Since the last newsletter we have grown from 108 to 112 members.

Although growing, as a Society we are still quite small and although bigger is not always better, we would like to extend our reach. Please continue to promote the Society through your networks and if you see any opportunities for us to touch new audiences, please let us know.

We would like to take this opportunity to spotlight one of our members, Dr Mey Goh, who has recently been promoted as Reader in Transdisciplinary Digital Manufacturing in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University. The promotion recognised her contributions to transdisciplinary research to manufacturing and industrial product-service systems in the last 20 years. At Loughborough University, she leads the Digital Automation Systems Design Laboratory in Intelligent Automation Centre and the Systems and Automation Research Unit in Wolfson School.

I have a PhD in Mechanical Engineering from University of Bristol, UK. Upon completion of PhD, I joined the Innovative design Manufacturing Research Centre at University of Bath. My work in Product-Service Systems addressed through-life Knowledge and Information Management (KIM), uncertainties and risk in costing and bidding. Through these projects, I have worked at the interface between engineering and other disciplines e.g. Management, Computer Science and problems where the people are always an essential part of the process! The experts and operators have the knowledge, experience and skills, but they are also subject to their own biases, perception and disagreement. This motivates me to develop ways and methods to better integrate the knowledge and requirements of people aspects to optimise the outcome of a human-technology as a system.

My vision is to embed transdisciplinary thinking and approaches to design inclusive and sustainable industrial systems that aligns with the aspirations of Industry 5.0. My research adopts mixed methodologies to bridge the knowledge and insights from multiple disciplines, and to underpin the development of novel data-driven approaches to support design and engineering of industrial digital technologies. Some of my recent and current projects include:

- Augmenting machine learning models with expert knowledge in low volume manufacturing*
- Visualisation methods for concept drift in machine learning models*
- Mental health and trust in automated systems*
- Data-driven human-robot interactions model*

I am currently a co-investigator of the Made Smarter Innovation: Centre for People-Led Digitalisation (2021-2025), working with Universities of Bath and Nottingham and a range of UK industry to realise the potential of a people-led approach to digitalisation. A short video on the Centre can be viewed [here](#).

Interesting Publications

In this section we identify publications which might be of interest to the community. If you come across any publications which you feel worthy of highlighting, please let us know.

DESIGNING EARLY WARNING SYSTEMS FOR DETECTING SYSTEMIC RISK: A CASE STUDY AND DISCUSSION

M Wever, M Shah, N O'Leary - Futures, 2021

Abstract: Systemic risks are potential trigger events or developments that could undermine the viability of entire networks or systems.

Growing complexity in systems make such risks both more likely to occur and more difficult to anticipate. The tools for detecting systemic risk have not kept pace with these challenges; traditional methods are too intermittent, too slow, and too narrow in focus for timely systemic risk detection. However, recent developments in big data analysis and artificial intelligence (AI) have the potential to revolutionize Early Warning Systems (EWSs) for detecting systemic risk. EWSs that are supported by these technologies could provide users with earlier warning signals of a wider range of risks and more up-to-date measures of the fragility of the system against these risks. This area of research is nascent and lacks a robust methodology for designing such EWSs. Addressing this issue, the present paper:

- 1) identifies the characteristics of competent EWSs;
- 2) outlines an approach for designing such EWSs; and
- 3) illustrates the value of this approach, by discussing the conceptual design of an EWS for detecting biosecurity incursions in the New Zealand pastoral industries

Knowledge integration in transdisciplinary sustainability science: Tools from applied critical realism

J Cockburn - Sustainable Development, 2021

Abstract: Transdisciplinarity, which seeks to transcend the limits of existing disciplines and the boundaries between science and society, has become a hallmark of sustainability science. Since transdisciplinarity requires researchers to co-produce knowledge by drawing together diverse knowledge systems, knowledge integration becomes a key challenge. However, the practice of knowledge integration brings to the fore tensions around philosophy, methodology and the role of the researcher. The purpose of this paper is to demonstrate the value of applied critical realism in enabling knowledge integration in transdisciplinary research, and in engaging these important tensions. I introduce tools from applied critical realism to enable knowledge integration across disciplinary and science-society boundaries in sustainability science. Using an illustrative case of place-based social-ecological research from South Africa, I demonstrate the application of these tools. I conclude with a reflection on how they enable reflection on tensions related to philosophy, methodology and researcher positionality, identifying some of the challenges I experienced in putting these tools to work.

Research Opportunities

The TREND Research Group (University of Bath), have a PhD studentship available to research transdisciplinarity within the automotive sector. You can find more details here <https://lnkd.in/dNuTDxP>. Please be aware, because of the way that this PhD is funded there are eligibility criteria which we are not able to change. For more details refer to the website.

The Made Smarter Innovation: Centre for People-Led Digitalisation (<https://vimeo.com/638588643>) has a number of PhDs / researcher positions available to research adoption of industrial digital technologies in the manufacturing sector. Applicants are welcome from any discipline. For further details of our current vacancies please contact the Centre at P-LD@bath.ac.uk

Other News

ISTE LinkedIn Group: Members have increased from 52 (15th Dec), to 53 members (23 March 2022). To access the group, click on this link [ISTE LinkedIn Group](#)

52nd Annual Tecnológico de Monterrey Research and Development Conference - Transdisciplinary Research and Education Panel

On March 2-4 at Monterrey City, Mexico, the 52nd annual Tecnológico¹ de Monterrey Research and Development conference was held. This time in a hybrid format with more than 5,000 attendees. The conference is a window in which students, researchers, practitioners, and institution stakeholders can openly share and discuss knowledge creation and practical implementations. One of the star events of the conference was the Panel for Transdisciplinary Research and Education. Chaired by Professor Federico Trigos (EGADE Business School) coordinating the panel included Professor Linda Newnes (University of Bath, UK), President of the International Society of Transdisciplinary Engineering (ISTE), Professor Bryan Moser (MIT, USA), Chair of the 2022 ISTE conference (forthcoming on July 5-8 at Cambridge MA USA).

The panel focused on the transdisciplinary idea that a new mindset can successfully approach many significant challenges of our time. This perspective requires a multi-dimensional approach with a set of engineering and non-engineering disciplines considering all stakeholders. In this sense, transdisciplinarity can flexibly handle the ambiguity and dynamics involved in complex, fast-paced, changing environments. This process imbues cognition to stakeholders and ecosystems.

Both panellists spoke about examples of Transdisciplinary projects that were born with this approach, and related the challenges and lessons learned. Professor Newnes explained how transdisciplinarity is practiced at the University of Bath in the new “Centre for People-Led Digitalisation” the purpose of which is to increase industrial productivity. Professor Moser also detailed the goals and planned activities to be held at the Transdisciplinary conference for this summer.

The panel concluded with the spirit that to successfully approach the ambiguity and complexity of many of our current challenges, the work guided by a transdisciplinarity mindset is paramount to the endeavour.



The panel was held at the main conference hall with around 60 remote attendees plus many in site ones.

Translation of a portion of David Garza (president of Tecnológico de Monterrey) closing conference message (in the media):

We concluded the 52nd edition of the Tec research conference, which brought together researchers from all the campuses of Tecnológico de Monterrey with experts such as Michael Young, Nobel Prize in Physiology and Linda Newnes, president of the International Society of Transdisciplinary Engineering, among others. For research to really have a great impact and achieve changes in our country, it is necessary to redouble efforts and have the support of all sectors.

¹ Tecnológico de Monterrey is an educational institution based in Mexico composed of 26 Campi, 94,400 students (high school, undergrad and grads in 7 schools), 21,100 professors and collaborators.

We are keen to hear from our members. If you have anything you would like to include in the next edition of the ISTE newsletter, please email sl2091@bath.ac.uk