The 27th International Conference on Transdisciplinary Engineering (TE2020)

The TE2020 conference is organized in cooperation with the International Society for Transdisciplinary Engineering (ISTE – http://www.intsoctransde.org). The conference will take place in Warsaw, at Warsaw University of Technology (https://www.pw.edu.pl/engpw/University), from **July 6 to 10, 2020**. Warsaw, the capital of Poland is also the national administrative, economic, cultural and scientific centre of the country. **There is a book about Poland: "About Polska" - https://www.msz.gov.pl/en//foreign_policy/public_diplomacy/publications/about_polska.**

The conference will link researchers and practitioners from industry and academia specialising in design and engineering disciplines as well as social science disciplines from around the world. On **July 6**, a set of pre-conference interactive **workshops** will bring together students, researchers, professors and experts discussing crucial topics of Transdisciplinary Engineering. After the conference, on **July 10**, **technical tour** and **industrial visit** will enable conference delegates to know more about local initiatives, joint research between industry and University, and highly promising industrial innovations.

Why Transdisciplinary Engineering?

Transdisciplinary Engineering is an emerging field that extends and transcends the initial basic concepts known as Concurrent Engineering (CE). CE has matured and has become the foundations of many new ideas, methodologies, initiatives, approaches and tools. Generally, CE concentrates on enterprise collaboration and its many different elements; from integrating people and processes to very specific complete multi/inter/trans-disciplinary solutions, taking the user into account. Current research on CE is driven by many factors like increased customer demands, globalization, (international) collaboration and environmental strategies. The successful application of CE in the past opens also the perspective for future applications like overcoming natural catastrophes, sustainable mobility concepts with electrical vehicles, and intensive, integrated, data processing, with an increasing importance of Transdisciplinarity. A transdisciplinary engineering approach transcends CE, because to design and develop solutions that are to be accepted in practice, collaboration is needed between various different disciplines, especially social-science and technical disciplines. People from both academia and practice need to collaborate to understand problems in their context, develop acceptable solutions and validate and implement solutions in practice. Methods and methodologies from both worlds are needed and need to be applied in a collaborative effort. Understanding, selecting and applying the necessary methodologies requires specific expertise and knowledge, that cannot be present in one person or discipline.

Transdisciplinarity is characterising modern research areas, in which natural sciences are related to social sciences, requiring mixed methodologies as well as the necessary expertise for achieving the work. It is expected to be a significant basis for future evolution, especially in all complex Engineering areas.

TE2020 proceedings will be published by IOSpress in OPEN ACCESS BOOK and fully indexed by Thomson Reuters/SCI, Scopus, Compendex/Ei and others.

Authors of distinguished papers will be invited to submit **extended versions** of their work to one of the following **international journals**:

- Advanced Engineering Informatics
- International Journal of Agile Systems and Management
- Journal of Industrial Information Integration
- Journal of Computational Design and Engineering
- Journal of Management Analytics
- International Journal of Computer Integrated Manufacturing
- Journal of Industrial Integration and Management

The TE2020 conference theme is "Transdisciplinary Engineering for Complex Sociotechnical Systems in the Context of Real-life Applications"

and focuses on the inter-, multi- and transdisciplinarity that drive future innovation in the context of Intelligent Factories and Industry 4.0. The concept of Industry 4.0 outlines the vision of a smart factory characterised by the complete networking of all production parts and processes: real time control via cyber-physical systems, increased use of robots, intelligent and adaptable production systems, which should contribute to greater productivity through resource efficiency. Convergence of production and interaction, work and communication increasingly require competencies from various different disciplines for remaining competitive. In addition to expert knowledge, flexibility, creativity and innovation are critical success factors for companies and their employees. However, **Industry 4.0 is not just about machines but also people**. The Internet of things, data and services are merging the physical and digital world. This is where knowledge-based services have a huge application potential. People, from different disciplines, are the bearers of this knowledge and the drivers of innovation.

In this context, Industry 4.0 also needs to be promoted through appropriate innovation and engineering approaches. Special attention should be also paid to human aspects and social reflections: **sustainable development, resource-efficient production system, innovative and successful economy, active participatory and collaborative processes, impact of technologies on human beings and societies. Social innovation** is a targeted reconfiguration of human-focused practices with the aim of better solving problems or satisfying needs by makes a contribution to human and social progress.

Transdisciplinary Engineering means the design and development of complex sociotechnical systems. Their creation, design and development are challenging and complicated in practice. These processes need intensive collaboration across different disciplines (technical as well as social sciences, from both academia and practice). The design spaces in many such real-life problems are often extremely large and difficult to penetrate. Research teams and practitioners try to use different methods and tools relevant for the problem at hand. The need to verify and validate such complex systems in real-life practice is actually one of the most important issues together with the development of suitable solutions.

The topics include but are not limited to:

The TE conference series welcomes papers on topics that address transdisciplinary engineering topics. Important for characterising papers as transdisciplinary engineering papers is that they address issues like:

1. The need for collaboration between different disciplines, not only technical ones and including practice
2. Methods for managing and supporting multidisciplinary teams as well as measuring their performance
3. Operational methods in transdisciplinary environments
4. Theoretical contributions to transdisciplinary engineering
5. Ways to prepare students for work in a transdisciplinary environment

The following list of keywords indicates the areas of interest for the conference. It is not an exhaustive list. If you as an author wish to submit a paper that can be characterised as transdisciplinary, then please, do so.

Product and process design:

- Design of Personalized Products and Services
- Product and production platforms
- Transdisciplinary Engineering for design optimisation
- Democratisation of design
- Citizen-/ community-led design
- Concurrent Engineering
- Human-centered Design

Man-machine interactions:

- Ergonomics, Human Factors and Social Sustainability
- Human-Robot Collaboration

Team Working:

- Managing cultural and disciplinary differences
- Methods for Transdisciplinary Teamwork
- Transdisciplinary Team Performance Measurement
- Collaborative Design Environments

Transdisciplinary approaches to:

- Decision Support Tools and Methods
- Value Engineering
- Risk Management
- Knowledge Management
- Enterprise Knowledge Management
- Cost Modelling, Analysis, and Engineering
- Additive and Subtractive Manufacturing
- Smart Factory, IoT, and Industry 4.0

- Digitization and Virtualization

Education:

- Transdisciplinary approach to education design and operation
- Transdisciplinary student projects

Collaboration and Management:

- Supply Chain Management
- Supply Chain Logistics
- Sustainable Energy Transition

Systems:

- Modelling of Complex Transdisciplinary Systems
- Transdisciplinary Systems Engineering
- Product Service Systems

Transdisciplinary Approaches to Sustainability:

- Sustainable Manufacturing Engineering
- Circular Economy
- Global Challenges
- Sustainable Energy Transition

Theoretical contributions to:

- Transdisciplinary Engineering Thinking and Practice
- Transdisciplinary Systems Thinking

Important Dates:

~~**December 31, 2019**~~ **January 10, 2020**
Abstract submission and workshop proposal deadline
~~**January 15, 2020**~~ **January 25, 2020**
Abstract notification
February 10, 2020
Full paper submission deadline
March 31, 2020
Notification of paper acceptance
April 1, 2020
Registration Opening
April 10, 2018
Final Paper submission
April 2020
Hotel information on website

Presentations:

Accepted papers can only be included in the proceedings when they have been presented in the conference. A maximum of two presentations per registered attendee is allowed.

Chairs:

Conference Chair

Jerzy Pokojski, Warsaw University of Technology (PL)

Program Chair

Linda Newnes, University of Bath (UK)

Program Co-Chairs

Susan Lattanzio, University of Bath (UK)

Wojciech Skarka, Silesian University of Technology (PL)

Margherita Peruzzini, University of Modena and Reggio Emilia (IT)

Josip Stjepandic, PROSTEP AG (DE)

Nel Wognum, Delft University of Technology (NL)

Cees Bil, Royal Melbourne Institute of Technology (AU)

Fredrik Elgh, Jönköping University (SE)