

Transdisciplinary



The 30th ISTE International Conference on Transdisciplinary Engineering

July 11-14, 2023

Dusit Thani Hotel
Hua Hin Cha Am, Thailand

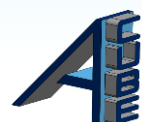
**Leveraging Transdisciplinary
Engineering in a Changing
and Connected World**



SCAN ME



Co-funded by the
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of the European Union



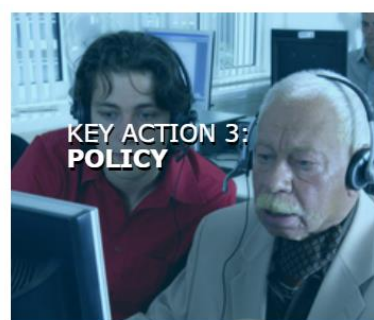
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Erasmus+ Programme
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The European Union's **Erasmus+** programme is a funding scheme to **support activities in the fields of Education, Training, Youth and Sport.**

The Programme is made up of three so-called "Key Actions" and two additional actions. They are managed partly at the national level by National Agencies and partly at the European level by the EACEA. The European Commission is responsible for Erasmus+ policies and oversees the overall programme implementation.

Erasmus+ actions managed by EACEA are listed below:



Website: https://eacea.ec.europa.eu/erasmus-plus_en



Reinforcing Non-University Sector at the Tertiary Level in Engineering and Technology to Support Thailand Sustainable Smart Industry (ReCap 4.0) has been selected for EU co-funding for Erasmus+ Key Action 2 for Capacity Building in Higher Education.

For more information, please visit: <http://recap4.ait.ac.th/>



Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry (MSIE4.0) was selected for EU co-funding for Erasmus+ Key Action 2 for Capacity Building in Higher Education.

For more information, please visit: <https://msie4.ait.ac.th/>

Transdisciplinary





Dear Participants,

Welcome to the 30th ISTE International Conference on Transdisciplinary Engineering (TE2023). The theme for the conference is "Leveraging Transdisciplinary Engineering in a Changing and Connected World."

As we are experiencing, technological advancement has created a new landscape for how business functions and exposed individuals to an open, connected world. All industrial, business, and education sectors have been challenged and have already begun to leverage technologies to improve operational performance. However, today's world is much more complex than technology alone can be the answer. Collaborative teams of people with an agile mindset and the ability to see a holistic picture and being equipped with knowledge and skills in various disciplines are indispensable to exploit the technologies effectively to create new conceptual, theoretical, methodological, and translational innovations that integrate and move beyond discipline-specific approaches to address a common problem in the changing and connected world.

TE2023 is able to attract the interest of people in academics as well as industry. We received 165 submitted abstracts from 32 countries on 6 continents and invited the authors of 140 abstracts to consider submitting their full papers. Our 100 reviewers engaged in reviewing 117 submitted papers, and upon their recommendations, we accepted 102 papers and invited their authors for oral presentations. We also invited the authors of the other 15 papers for a poster session. We are delighted to inform you that the authors of 93 papers are with us for oral presentations and of 9 papers for poster presentations.

Furthermore, five distinguished keynote speakers listed below kindly accept our invitations to share their valuable experiences and insights with our participants in different aspects, from economy to industry to technology to design and education.

- Hon. Abhisit Vejjajiva, Former Thai Prime Minister
- Dr. Sampan Silapanad, Vice President, Hard Disk Drive Operations – Thailand, Western Digital Corporation
- Prof. George Q. Huang, Chair Professor of Smart Manufacturing, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong, P. R. China
- Prof. Claudia Eckert, Professor of Design, School of Engineering and Innovation, Faculty of Science, Technology, Engineering & Mathematics, The Open University, United Kingdom
- Prof. Cynthia J. Atman, Professor, Human Centered Design & Engineering, Mitchell T. and Lella Blanche Bowie Endowed Chair, Director, Center for Engineering Learning & Teaching, College of Engineering, University of Washington, USA

Besides, we will have a few TE2023-related special issues in reputed international journals. After the conference, some authors will be invited to submit the extended versions of their TE2023 papers to one of them.

TE2023 Organizing Committee wants to express our sincere gratitude to our participants for their strong support and looks forward to welcoming all participants. Contributions in all aspects from all parties make this TE2023 successful.

For the final note, social activities and entertainment await for the participants to enjoy. We hope you will enjoy your participation at TE2023 in the Land of Smiles.

Pisut Koomsap

(Chair of the TE2023)

	10-Jul-23	11-Jul-23	12-Jul-23	13-Jul-23	14-Jul-23	
8:00	Assemble at AIT Center	Registration	ISTE Council Breakfast			8:00
9:00	Visit Learning Future Factory Laboratory, AIT	Opening and Photo	Parallel Session 3	Keynote 4	Check out and Assemble at the lobby	9:00
10:00	Visit National Electronics and Computer Technology Center (NECTEC)	Keynote 1		Coffee Break		10:00
11:00		Coffee Break	Coffee Break	Parallel Session 5	Travel to NaSatta Park (Lunch on the bus)	11:00
12:00	Lunch at Swan Lake Restaurant	Keynote 2	Parallel Session 4			12:00
13:00		Lunch at The Restaurant	Lunch at The Restaurant	Lunch at The Restaurant		13:00
14:00	Travel to Hua Hin Cha Am*	Parallel Session 1	Keynote 3	Parallel Session 6	Cultural Visit at NaSatta Park	14:00
15:00		Parallel Session 2	Workshop Session 1	Coffee Break		15:00
16:00		Coffee Break & Poster Session	Coffee Break	Keynote 5	Travel back to Bangkok*	16:00
17:00		Panel Session	Workshop Session 2	Annual General Meeting of ISTE (AGM)		17:00
18:00			Sightseeing			18:00
19:00	Pizza and Beer at San Marco	Welcome Dinner at Krua Huai Sai	Rajabhakti Park			19:00
20:00			Local Visit	Gala Dinner and Closing Ceremony at The Stable	* Extra time may be needed due to traffic around the Bangkok area	20:00
21:00			Hua Hin Night Market			21:00
22:00						22:00



Click on each block to see the detail.

July 11, 2023, 9:30 – 10:30
Venue: Napalai Ballroom



Hon. Abhisit Vejjajiva
Former Thai Prime Minister

Title of the Keynote:
**Driving a Value-Based Economy with
Transdisciplinarity in a Changing and Connected World**

Short bio: Hon. Abhisit Vejjajiva was Thailand's 27th Prime Minister, holding the post from December 2008 to August 2011. He has been elected to Parliament for eight terms since 1992. He served as Government Spokesperson during 1992-1994 and as a Minister Attached to the Prime Minister's Office during 1997-2001. Besides, he has assumed many other responsibilities over two and a half decades, including Deputy-Secretary to the Prime Minister for Political Affairs, Chairman of the House Education Affairs Committee, and Leader of the Opposition in the House of Representatives for three terms. Within the Democrat Party, he has also assumed many positions: Party Spokesman, Deputy Party Leader, and from 2005-2019, Party Leader. He also served as Chairman of the Council of Asian Liberals and Democrats in 2017-2018. Born in Newcastle-upon-Tyne in the United Kingdom in 1964, after completing his primary education in Thailand, he returned to the United Kingdom to study at Eton College. He later graduated with a Bachelor's Degree in Philosophy, Politics, and Economics (PPE) with 1st class Honours from Oxford University, where he also earned a Master's Degree in Economics. In addition, he obtained another Bachelor's Degree in Law from Ramkhamhaeng University, Thailand. Before entering politics, he was an instructor at the Chulachomklao Royal Military Academy from 1987 to 1988 and at the Faculty of Economics, Thammasat University from 1990 to 1991.

July 11, 2023, 10:45 – 11:45
Venue: Napalai Ballroom



Dr. Sampan Silapanad

Vice President, Hard Disk Drive Operations – Thailand
Western Digital Corporation

Title of the Keynote: Don't Solve by Set Assumptions

Short bio: Dr. Sampan has started his career at National Semiconductor, before moving to Seagate Technology, and then to Western Digital. His expertise and experience have been in the field of Electronics and HDD manufacturing for 40 years.

During this period, he has initiated several projects related to linking the industry with skill development for Thailand's manpower and has been actively involved in such projects, connecting with the government, society and all stakeholders as a representative of Western Digital.

Presently, Dr. Sampan is a board member in 9 ministries covering works in the areas of education, society, science and technology, and environment. He is also President of Thailand's Electronics and Computer Employers Association (ECEA), and Co-chair of the World Association for Cooperative Education (WACE). With effective implementation of student development programs in industries for 14 years, more than 1,500 students have joined the program including 300+ foreign students from 100+ local and overseas universities.

He has received many awards from both Thai and international organizations on his effort and achievement in raising the quality of education system and addressing the UN's Sustainable Development Goals and ESG's.

Dr. Sampan graduated with a Bachelor's degree in Mechanical Engineering from Kasetsart University, Thailand. He earned a Master's degree in Management from Sasins Graduate Institute of Business Administration of Chulalongkorn University, Thailand. He was bestowed an Honorary Doctorate of Industrial Engineering from Suranaree University of Technology, Thailand.

July 12, 2023, 13:00 – 14:00
Venue: Napalai Ballroom



Prof. Cynthia J. Atman

Professor, Human Centered Design & Engineering
Mitchell T. and Lella Blanche Bowie Endowed Chair
Director, Center for Engineering Learning & Teaching
College of Engineering
University of Washington, USA

Title of the Keynote: **Good Designers do “X”**

Short bio: Cynthia J. Atman is the founding director of the Center for Engineering Learning & Teaching (CELT), a professor in Human Centered Design & Engineering, and the inaugural holder of the Mitchell T. & Lella Blanche Bowie Endowed Chair at the University of Washington. She was director of the Center for the Advancement of Engineering Education (CAEE), a national engineering education research center that was funded by the National Science Foundation. Her research focuses on design expertise, engineering design learning, considering context in engineering design, and the use of reflection to support learning. She is a fellow of the American Association for the Advancement of Science (AAAS) and the American Society for Engineering Education (ASEE). Dr. Atman holds a Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

July 13, 2023, 9:00 – 10:00
Venue: Napalai Ballroom



Prof. Claudia Eckert

Professor of Design
School of Engineering and Innovation
Faculty of Science, Technology, Engineering & Mathematics
The Open University, United Kingdom

Title of the Keynote:

Transdisciplinary Ecosystem of Methods

Short bio: Claudia Eckert is Professor of Design at the Open University, the British distance education university, where she also carried out her doctoral research on design processes in the knitwear industry, before spending nearly 10 years in the Engineering Design Centre at the University of Cambridge. Her research interests are in understanding and supporting design processes. She is also working on comparisons between design domains.

Transdisciplinarity is a lived experience for Prof Eckert. She studied mathematics in Augsburg, Oxford and Munich and obtained an undergraduate degree in Philosophy from the Munich School of Philosophy. She has an MSc in Applied Artificial Intelligence from the University of Aberdeen and a PhD in Design from the Open University. Her research has applied techniques drawn from sociology and cognitive science. She has always been fascinated by design as a complex human endeavour where large and diverse groups of people come to together to achieve common goals. She studies with equal passion future trends in engineering, sustainability in fashion, overdesign in building services, and the epistemology of engineering design.

She has published widely and serves as an area editor for Research in Engineering Design and Design Science. She is chair of the advisory board of the Design Society.

July 13, 2023, 15:00 – 16:00
Venue: Napalai Ballroom



Prof. George Q. Huang

Chair Professor of Smart Manufacturing
Department of Industrial and Systems Engineering
The Hong Kong Polytechnic University, Hong Kong, P. R. China

Title of the Keynote:

Trilogy of Innovations for Achieving High-Performance Cyber-Physical Factory

Short bio: George is Chair Professor of Smart Manufacturing at Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University. He gained BEng and PhD in Mechanical Engineering from Southeast University (China) and Cardiff University (UK) respectively. He has conducted research projects in areas of Smart Manufacturing, Logistics, and Construction Systems Analytics through IoT-enabled Cyber-Physical Internet with substantial government and industrial grants exceeding HK\$120M. He collaborated closely with industries through joint projects and start-up companies. He has published extensively and his works have been widely cited by research communities. He serves as associate editors and editorial members for several international journals. He is Chartered Engineer (CEng), Fellow of ASME, CILT, HKIE, IET, and ISE..



Panel Session: Defining Transdisciplinary Engineering

Session Chairs: Dr. Adam Cooper and Dr. Susan Lattanzio

The success of the ISTE depends on having a larger and growing community focused on understanding and developing Transdisciplinary Engineering (TE) practice. We believe that by thoughtfully defining TE we can consolidate the community, give it direction, and connect meaningfully to other communities. However, for emerging disciplines such as Transdisciplinary Engineering it is not always possible or indeed desirable to immediately implement an “absolute definition”.

To this end, a working group of ISTE members has come up with an initial definition document as given below. Within this document we seek to create a “working definition”, which will be regularly reviewed and updated by the members of the ISTE. In this way it helps to frame discussions, whilst allowing the opportunity for the community to reflect on, consolidate and evolve its aims and scope.

We will discuss this topic in more depth at the upcoming TE2023 conference in Thailand. We welcome your participation in this effort, by reviewing the document below, commenting and contributing to it at the TE2023 conference or by contacting the ISTE board directly.

To kick that off, we would like to encourage the participants to review this document ([click here to read the document](#)) and voice out through a short survey ([click here to take the survey](#)). It should only take 2-3 mins to complete.

We will use the data from the survey to inform the debate at the session and to think about how we organise future TE conferences that align with the ideas we capture

[Click here to read the document](#)



[Click here to take the survey](#)





SCAN ME

Registration

Workshop Session 1&2

July 12, 2023, 14:00 – 15:00, 15:15 – 16:15

Workshop no. 1



Venue: Napalai Ballroom



SCAN ME

July 12th
14:00 – 15:00,
15:15 – 16:15

Human-Centric Digital Twin – A Transdisciplinary View

Prof. Margherita Peruzzini – University of Modena and Reggio Emilia
Dr. Pietro Bilancia, PhD. – University of Modena and Reggio Emilia
Dr. Josip Stjepandić, PhD. – PROSTEP AG, Germany

Workshop no. 2



Venue: Bor Fai 1



SCAN ME

July 12th
14:00 – 15:00,
15:15 – 16:15

Interactive Simulation for Policy Makers towards GHGs Reduction in International Shipping

Nonomura, Shiyuan Wang, and Kazuo Hiekata
The University of Tokyo

Workshop no. 3



Venue: Bor Fai 2



SCAN ME

July 12th
14:00 – 15:00,
15:15 – 16:15

Learning Strategies and Experiments for Transdisciplinary Engineering Education

Bryan Moser
Massachusetts Institute of Technology and University of Tokyo

Workshop no. 4



Venue: Huay Sai 1



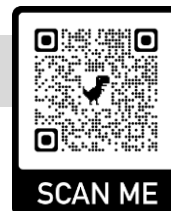
SCAN ME

July 12th
14:00 – 15:00,
15:15 – 16:15

Immersive Teamwork: Exploring the Potential Virtual Reality for Collaborative Teamwork

Kyaw Htet Oo, Rong Peng, and Siam Sarwar
Asian Institute of Technology

P1-A: Critical Issues in TE

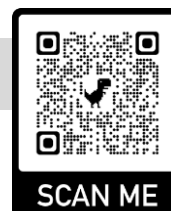


Session Chair: Prof. Federico Trigos

Venue: Napalai Ballroom

July 11th 13:00 – 14:00	Towards a Framework for Understanding Transdisciplinary Engineering in Policy Practice: Insights from the UK's Energy Ministry (ID 20) Laurent Liote	
	Overcoming the Challenges of Conducting Transdisciplinary Engineering Research: A Case Study of the Made Smarter Innovation: Centre for People-Led Digitalisation (ID 24) Susan Lattanzio, Linda Newnes, Mey Goh and Robert Houghton	
	Global patent technology portfolio study of agricultural UAV innovations (ID 28) Amy J. C. Trappey, Joseph G.B. Lin, Kevin H.K. Chen and Mickey M.C. Chen	

P1-B: PDD

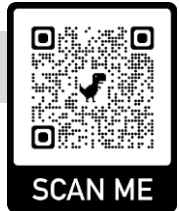


Session Chair: Dr. David Rosen

Venue: Bor Fai 1

July 11th 13:00 – 14:00	Aspects affecting Boundary Objects in Product Realization – A systematic literature review (ID 51) Daniel Hussmo, Kristina Säfsten and Paraskeva Wlazlak	
	Translating the Three-Dimensional Mathematical Modelling of Plant Growth to Additive Manufacturing (ID 64) Amy Tansell, Galane Luo, Lauren Thomas-Seale and Rosemary Dyson	
	A Bio-Inspired Mathematical Approach to Design for Additive Manufacturing (ID 59) Galane Luo, Rosemary Dyson and Lauren Thomas-Seale	

P1-C: Smart Operation for VCM

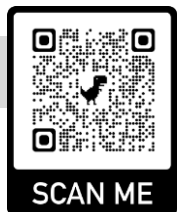


Session Chair: Dr. Josip Stjepandic

Venue: Bor Fai 2

July 11th 13:00 – 14:00	Applying Deep Learning to Establish A Telemedicine Assistance System: A Case Study of the Stage Classification of Pressure Injuries (ID 94) Ming-Chuan Chiu, Tsung-Yu Tseng , Chi-Chang Chang and Chun-Chia Chen	
	Developing an Intelligent Warning System to Detect Unsafe Driving Behaviors (ID 121) Pin-Rui Feng, Sheng-Po Hung, Yi-Husan Chen, Ming-Chuan Chiu, and Zhe-Rui Bai	
	The design of Machine Learning using AI model for searching casualty people in the Gulf of Thailand (ID 155) Athakorn Kengpol and Chawantorn Chanchittakarn	

P1-D: Teamwork

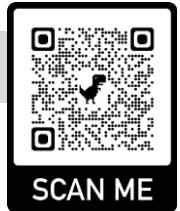


Session Chair: Prof. Cees Bil

Venue: Huay Sai 1

July 11th 13:00 – 14:00	Group Dynamics and Air Traffic Controllers' Safety Behaviors: Self-efficacy as A Mediator (ID 75) Qingli Liu , Fan Li, Ching-Hung Lee and Su Han	
	Team Composition, Recomposition, and Role Selection in Long-term Educational Programs: A Theoretical Framework using Multiple Criteria Approach (ID 81) Krissada Chalermsook and Chutiporn Anutariya	
	Design of a Lithium-ion Battery Pack for a Small Urban Electric Vehicle: Challenges and Lessons Learned by a Transdisciplinary Team (ID 38) Samuel Henrique Werlich, Joelton Deonei Gotz, Fernanda Cristina Corrêa and Milton Borsato	

P2-A: Critical Issues in TE

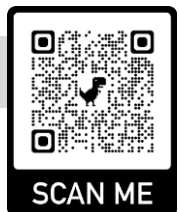


Session Chair: Prof. Shuo-Yan Chou

Venue: Napalai Ballroom

July 11th 14:00 – 15:00	UAV-Assisted Emergency Response: An Interdisciplinary Perspective (ID 43) Yuying Long, Haoyue Zhang, Xinyue Wang and Gangyan Xu	
	Towards Creativity Measurement in the Energy Industry (ID 52) Zhao Zhang, Chadwick Holmes and Victor Tang	
	System Dynamics Simulation to Reduce the Number of Patients with Lifestyle-related Diseases and Medical Costs in Japan by Promoting Behavioral Change (ID83) Shingo Kawai, Masako Toriya and Tetsuya Toma	

P2-B: PDD



Session Chair: Prof. Ming-Chuan Chiu

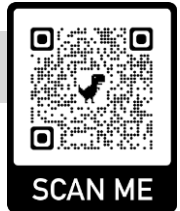
Venue: Bor Fai 1

July 11th 14:00 – 15:00	Exploring Intelligent User Interfaces from Design Students' Perspective on Smart Home Products through Peer Assessment, Focus Group and ChatGPT (ID 124) Jo-Yu Kuo and Ziqing Xia	
	A study on habit formation and its measurement in the use of digital health care service (ID 9) Satoko Kanemoto, Joe Ichino, Manabu Miyazaki and Kenji Tanaka	
	The effects of Adaptive Automation on pilots' flight control performance and visual attention distribution (ID 58) Mengtao Lyu, Fan Li and Ching-Hung Lee	

Parallel Session 2 (P2-C, P2-D)

July 11, 2023, 14:00 – 15:00

P2-C: Smart Operation for VCM

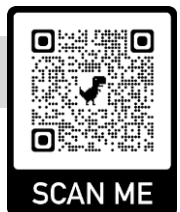


Session Chair: Prof. John P.T. Mo

Venue: Bor Fai 2

July 11 th 14:00 – 15:00	The means to achieve a digital transition of manufacturing shop floor (ID 14) John Bang Mathiasen and Pernille Clausen	
	Using Collaborative Immersive Environments and Building Information Modeling Technology for Holistic Planning of Production Lines (ID 103) Sebastian Amann, Nicolai Beisheim, Polina Haefner, Victor Haefner, Anjela Mayer, Felix Longge Michels, Tobias Ott and Kevin Kastner	
	Exploring the adoption of UX-driven approaches to design industrial PLC user interfaces (ID 41) Margherita Peruzzini, Lorenzo Valentini, Alessio Tutarini, Pietro Bilancia and Roberto Raffaeli	

P2-D: Teamwork

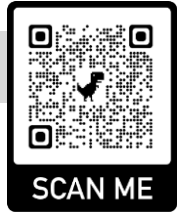


Session Chair: Prof. Tetsuya Toma

Venue: Huay Sai 1

July 11 th 14:00 – 15:00	Engagement Mechanisms in Workshops for Sustainable Community Development (ID 138) Bruce Hecht, Ted Halsey, Mai Nguyen and Bryan Moser	
	Improvement of the Mizusumashi System in an Electrical Devices Company: a Case of Transdisciplinary University-Business Cooperation (ID 154) Beatriz Sousa, Hugo Costa, Joana Ferreira, Patrícia Brandão, Sara Gomes, Sofia Vale, Sónia Fernandes, Tiago Faria and Rui Sousa	
	The impact of cultural change: a transdisciplinary engineering case study (ID 170) Harley-Louise Beattie, Linda Newnes and Vimal Dhokia	

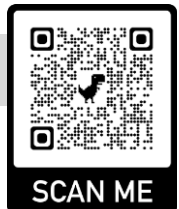
P3-A: Engineering Education



Session Chair: Dr. Wim Verhagen
Venue: Napalai Ballroom

July 12 th 9:00 – 10:20	Designing Transdisciplinary Engineering Programmes: A new wave in engineering education (ID 145) Irina Lazar, Laurent Liote and Adam Cooper	
	Data Analytics for Admission Process: Bachelor of Engineering Program (ID 80) Kunlapat Thongkaew, Sangsuree Vasupongayya and Thanita Loywirat	
	In Pursuit of Greater Coherence Between Learning Outcomes and Competence Development for Successful Teaching of Engineering (ID 113) Cathal de Paor, Pisut Koomsap and Duangthida Hussadintorn Na Ayutthaya	
	A Transdisciplinary Framework that Integrates Multi-Engaging Educational Tools in Active Learning Experiences to Enhanced Student Critical Thinking (ID 10) Federico Trigos and María Eloísa Pérez-González	

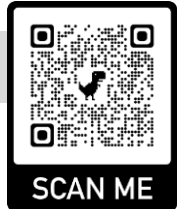
P3-B: Teamwork



Session Chair: Prof. Kazuo Hiekata
Venue: Bor Fai 1

July 12 th 9:00 – 10:20	Using Immersive Technologies and Digital Twins for interdisciplinary Teamwork in Architecture, Engineering and Construction (ID 86) Nicolai Beisheim, Haydar Kayapinar, Markus Linde, Tobias Ott and Sebastian Amann	
	Scope Attributes, Systemic Effect, and Estimation Practices for Software Projects (ID 97) Dipti Garg and Bryan Moser	
	Team decision making considering uncertainty in data visualisation (ID 134) Ainoa Abella, Midori Sugihara, Vanja Čok, Tomiya Kimura, Testuya Toma and Jonathan Chacón	
	Transdisciplinary Setup Guide for Automated Maintenance Training Generation in Virtual Reality from Virtual Commissioning (ID 74) Sascha Quast and Kathrin Konkol	

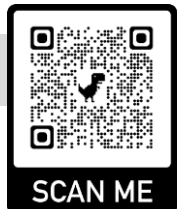
P3-C: Smart Operation for VCM



Session Chair: Prof. Margherita Peruzzini
Venue: Bor Fai 2

July 12 th 9:00 – 10:20	Leveraging Digital Twin as a Service in Digital Business Ecosystem (ID 29) Sergej Bondar, Philipp Kremer, Johannes Lutzenberger and Josip Stjepandic	
	Leveraging Transdisciplinary Engineering through the Coalescence of Digital Twins and XR-Technologies (40) Kevin Kastner, Joel Lehmann , Matthias Rädle, Julian Reichwald, Felix Wuehler, Sebastian Amann and Nicolai Beisheim	
	Digital Twin as Enabler of Sustainability and Risk Management of Medical Devices (ID 115) Roberto Riascos, Tomislava Majić, Egon Ostrosi, Jean-Claude Sagot and Josip Stjepandic	
	A digital twin concept in the development of a digital multi-modal door-to-door travel planner (ID 159) Jiezhuma La, Cees Bil , Iryna Heiets and Ken Lau	

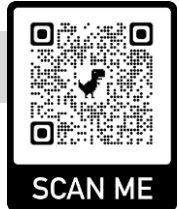
P3-D: Theoretical Contributions



Session Chair: Prof. Milton Borsato
Venue: Huay Sai 1

July 12 th 9:00 – 10:20	An Approach to Innovative Design within Complex Projects with the application of TRIZ (ID 3) Matthew Cook and John P.T. Mo	
	The Pathway to Sustainability in Transdisciplinary System Development (ID 4) John P.T. Mo and Ronald C. Beckett	
	Creating a Symbiotic Interface for a Digital Twin (ID 19) Chacón Claire Palmer, Yee Mey Goh , Ella-Mae Hubbard, Rebecca Grant and Robert Houghton	
	A Framework with Layered View Mechanisms and Interaction Paths for Industry Chain and Innovation Chain In-depth Integration (ID 35) Ching-Hung Lee and Chang Wang	

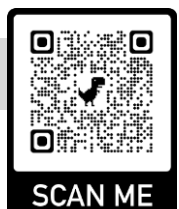
P4-A: Engineering Education



Session Chair: Dr. Irina Lazar
Venue: Napalai Ballroom

July 12 th 10:40 – 12:00	A Transdisciplinary Framework to Design Immersive Progressive Complexity Learning Experiences (ID 8) Federico Trigos and Francisco Tamayo	
	Knowing Your Learners to Scaffolding Their Autonomy: The Perspective of Learner Capability and Perception (ID 152) Duangthida Hussadintorn Na Ayutthaya, Pisut Koomsap and Cathal de Paor	
	Design and Development of a Tool for Measuring Learning Outcomes in a Manufacturing Engineering Program Based on Outcome-Based Education (ID 77) Suriya Jirasatitsin, Wanida Rattanamanee, Thanate Ratanawilai, Klangduen Pochana, Chukree Daesa, Pichet Trakarnchaisiri, and Kunlapat Thongkaew	
	The Concept of Failure in Engineering Education – A Transdisciplinary Perspective (ID 164) Wim Verhagen	

P4-B: PDD



Session Chair: Dr. Mey Goh
Venue: Bor Fai 1

July 12 th 10:40 – 12:00	How personalization algorithm changes consumer behaviors in the digital healthcare service (ID 6) Joe Ichino, Manabu Miyazaki and Kenji Tanaka	
	Data-Driven Evaluation of Passengers' Experience and Service Preferences Analysis (ID 137) Ai-Che Chang and Wei-Chen Lu	
	Apply Deep Learning Models to Build a Personalized Attraction Recommendation System in A Smart Product Service System (ID 120) Cheng-Zhou Tsai, Pei-Yi Tai, Hao Huang, Chia-Jung Wei and Ming-Chuan Chiu	

P4-C: Smart Operation for VCM



SCAN ME

Session Chair: Dr. Martin Lennartsson

Venue: Bor Fai 2

July 12 th 10:40 – 12:00	Connect your smart manufacturing via Smart Work: A single-case study from the Renewable Energy Industry (ID 17) Pernille Clausen, David Vrabec and John Bang Mathiasen	
	Investigating government subsidy and policy to encourage the adoption of the energy storage system and electric vehicle: A system dynamics model approach (ID 88) Shuo-Yan Chou, Tiffany Hui-Kuang Yu, Erma Suryani, Rafika Rahmawati, Firin Handayani and Anindhita Dewabharata	
	Developing a Green Supplier Risk Assessment System Applying Natural Language Processing and Life Cycle Assessment: An Empirical Study (ID 69) Pei-Yi Tai, Ming-Chuan Chiu, Chia-Jung Wei, Hsiao-Fan Wang and Chih-Yuan Chu	
	A New Customer Complaint Handling Process Redesign for Five-axis Machinery Solution Sales and Delivery in Aviation Manufacturing Industry (ID 33) Ruah Younes, Chang Wang, Ching-Hung Lee, Fan Li and Shang-Ru Yang	

P4-D: Theoretical Contributions



SCAN ME

Session Chair: Prof. Bryan Moser

Venue: Huay Sai 1

July 12 th 10:40 – 12:00	Defining a flexible value framework for digital products and services using systems engineering and AI approaches (53) R. Chadwick Holmes and Hemant Kumar	
	An Exploration of Determinants of Corporate Social Innovation: Insights into Organizational Capabilities (ID 82) Tsui-Yii Shih	
	Transdisciplinary engineering versus transdisciplinary research: differences, similarities, lessons and opportunities (ID 109) Adam Cooper	
	Human-centric Digital twin: a transdisciplinary view (ID 150) Margherita Peruzzini, Pietro Bilancia, Josip Stjepandic, Tomislava Majic and Egon Ostrosi	

P5-A: Critical Issues in TE



Session Chair: Prof. Kenji Tanaka
Venue: Napalai Ballroom

July 13th 10:20 – 12:00	Inclusive Interactive Simulation: Stakeholder Empowerment in Design (ID 90) Ira Winder and Kazuo Hiekata	
	Integrating Deep Learning Models and Depth Cameras to Achieve Digital Transformation: A Case Study in Shoe Company (ID 96) Li-Sheng Yang, Ming-Chuan Chiu and Yu-Jui Huang	
	EEG-based Stress Recognition through the Integration of Convolutional Neural Networks and Mixture of Experts Ensemble Modelling (ID 117) Ziqing Xia, Justin Jixi Wen, Chun-Hsien Chen, Meng-Hsueh Hsieh and Jo-Yu Kuo	
	A Simulation of Human Mobility that Reproduces the Behavioral Characteristics (ID 131) Yuri Mizuno, Daishi Sagawa, Yuya Kimura and Kenji Tanaka	
	Opportunities and Challenges for drone industries in Thailand (ID 136) Monchai Suraratchai, Panumas Arundachawat and Medhawin Kitikun	

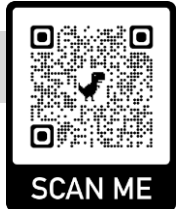
P5-B: PDD



Session Chair: Prof. Amy Trappey
Venue: Bor Fai 1

July 13th 10:20 – 12:00	Analysis of Product Development Connected to Production for Industrialized Housebuilding (ID 63) Martin Lennartsson, Dag Raudberget and Fredrik Elgh	
	A Design Framework for Cyber-Physical-Human-Systems (ID 12) David Rosen and Christina Choi	
	UX-driven methodology to design usable Augmented Reality applications for maintenance (ID 37) Lorenzo Valentini, Fabio Grandi, Margherita Peruzzini and Marcello Pellicciari	
	The complex reality of modularization – an approach/metamodel towards business-driven modularization of smart products (ID 39) Dan Lennartsson, Dag Raudberget, Kurt Sandkuhl and Ulf Seigerroth	

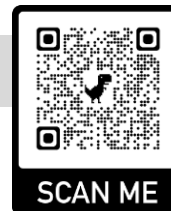
P5-C: Smart Operation for VCM



Session Chair: Prof. Pietro Bilancia
Venue: Bor Fai 2

July 13th 10:20 – 12:00	A mathematical model for 3D Bin Packing in Robotic Mobile Fulfillment Systems (ID 50) Moritz Sontheimer , Shuo-Yan Chou and Yu-Lin Kuo	
	A Novel Robotic EDM Digital Twin for Offline Cutting-Path Programming (ID 18) Sergio de Almeida, John Mo , Cees Bil, Songlin Ding and Chi-Tsun Cheng	
	Development of Collaborative Multi-Robotics Assembly System with Digital Twin Approach (ID 151) Kyaw Htet Oo and Pisut Koomsap	
	Tensor Field for Five-Axis Machining (ID 30) Stanislav Makhanov	
	Applying Hybrid Machine Learning Models to Assist Small and Medium Enterprises in Achieving Quality Prediction and Adaptive Digital Transformation: A Case Study of Injection Molding Industry (ID 91) Ming-Chuan Chiu, Yu-Jui Huang and Li-Sheng Yang	

P5-D: TE Approaches

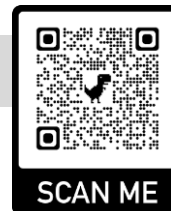


Session Chair: Prof. Kanchana Sethanan

Venue: Huay Sai 1

July 13th 10:20 – 12:00	Transdisciplinary Framework for Waste to Energy Technologies (ID 11) Federico Trigos and Adriana Guerra	
	MetaTwin: the foundational element of cloud manufacturing metaverse (ID 21) Ming Li, Hang Wu and Mingxing Li	
	A Transdisciplinary Approach for Predicting and Tuning to Optimise Initial Business Performance Steady State in a Changing and Connected Environment (ID 25) Federico Trigos and Carlos Aldana	
	Exploring User Perceptions From The User-centered Usability Perspective of The Museum Online Virtual Exhibitions (ID 32) Fazal Gilani, Chang Wang , Fan Li and Ching-Hung Lee	
	Developing the System Model of Human Behaviour and Its Implications on Social Systems Design (ID 34) Ysanne Yeo and Masahiro Niitsuma	

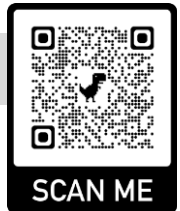
P6-A: Engineering Education



Session Chair: Dr. Adam Cooper
Venue: Napalai Ballroom

July 13th 13:00 – 14:40	Active Learning in Engineering Education: Case Study in Mechanics for Engineering (ID 22) Chawannat Jaroenphasemmesuk , Rui Lima, Kathleen Horgan, Diana Mesquita and Tuangyot Supeekit	
	Digital Manufacturing Pilot Study for Stepping Towards Mixed Reality Applications in Tertiary Education (ID 47) Mihaela-Elena Ulmeanu, Manuela-Roxana DijmĂrescu , Bogdan-Felician Abaza, Andrei Szuder and Cristian-Vasile Doicin	
	Industrial Management for Industry 4.0 – Simulation System to Support Learning of Opportunities and Challenges of Dealing with Real-Time Data (ID 65) Rui M. Lima , Bruno Gonçalves, Erik Lopes, Vicente F. Tino and Rui Sousa	
	Problem-based Learning in Marketing Engineer Course: A Case Study from Industrial Engineering Curriculum (ID 144) Krissanarach Nitisiri, Thitipong Jamrus , Kanchana Sethanan, Danaipong Chetchotsak and Thawee Nakrachata-Amon	
	Investigating the Potential of Mixed Teaching Methods to Enhance Manufacturing Process Learning in Undergraduate Program (ID 153) Noppakorn Phuraya , Piyawan Thatsananchalee and Natchana Bhutasang	

P6-B: PDD



Session Chair: Prof. John Bang Mathiasen
Venue: Bor Fai 1

July 13th 13:00 – 14:40	A method of integrating design information in the aircraft concept design process (ID 48) Wojciech Skarka	
	A Study on Co-creation of Wind Turbine Arrays in Offshore Wind Farms (ID 70) Kuniko Mishima and Nozomu Mishima	
	Integrating the Design of the Product Life Cycle by a Master Bill of Materials (ID 16) Roland Stolt	
	The Use of Design Assets as potential Platform Elements in two Manufacturing Disciplines (ID 61) Dag Raudberget, Fredrik Elgh, Martin Lennartsson and Rhith Areth Koroth	
	Kano-based Design For B-to-B Customized Product Configuration Service (ID 84) Ching-Hung Lee, Chang Wang and Fan Li	

P6-C: Smart Operation for VCM



Session Chair: Prof. Ulf Seigerroth

Venue: Bor Fai 2

July 13 th 13:00 – 14:40	Scheduled Transport Service Design for Cross-Border Logistics in Airport Cluster (ID 44) Wenzhao Dong, Xuan Qiu and Gangyan Xu	
	Replenishment Policy and SKU Classification to Pod Assignment Design for Robotic Mobile Fulfillment System Performances (ID 85) Shuo-Yan Chou, Edwin Hendrawan, Anindhita Dewabharata and Ferani Eva Zulvia	
	Uncertainty-Aware Container Warehousing Planning for Port Throughput Improvement (ID 87) Keisuke Abe, Kosuke Nagahata and Kenji Tanaka	
	Application of holistic detection in industrial motion and time study (ID 129) Anintaya Khamkanya, Panthakij Paulguy and Siamrut Em-O	
	A Flexible and Intelligent Production System for Process Planning and Enterprise Performance Optimization (ID 147) Ederson Carvalhar Fernandes, Jaqueline Sebastiany Iaksch, Sandro Jesse Ferreira Tabor, Luiz Gustavo Romanel, Liam Brown and Milton Borsato	

P6-D: TE Approaches



Session Chair: Dr. Susan Lattanzio

Venue: Huay Sai 1

July 13 th 13:00 – 14:40	Service Science and Engineering: A Transdisciplinary Normative Paradigm (ID 156) Victor Tang	
	The users to target to understand disciplinarity in a project? (ID 45) Jana Sajdakova, Emily Carey and Linda Newnes	
	Evaluation of Feebate by Multi-Agent Simulation for Policy Making in the Complex International Maritime Transport (ID 56) Kazuho Nonomura, Kazuo Hiekata, Nariaki Nishino and Takuya Nakashima	
	A Transdisciplinary Approach to the University Timetabling Problem (ID 146) Federico Trigos and Roberto Coronel	



Poster Presentations

July 11, 2023, 15:00 – 16:00

<p>July 11th 15:00 – 16:00</p>	<p>Concurrent Engineering and Application in Digital Manufacturing subject (ID 15)</p> <p>Athakorn Kengpol, Chayathach Phuaksaman, Phattarasaya Tantiwattanakul, Chawantorn Chanchittakarn and Karakade Buakaew</p>	
	<p>Empowering Digital Twins by Conceding them an Architecture for Proactive Collaboration Behavior (ID 46)</p> <p>Tim Häußermann, Joel Lehmann, Alessa Rache and Julian Reichwald</p>	
	<p>Innovative Teaching and Learning for Lean Manufacturing Course (ID 110)</p> <p>Siravit Swangnop, Rui M. Lima, Diana Mesquita, Kathleen Horgan, Cathal de Paor and Warapoj Meethom</p>	
	<p>A Primer on the Integral Viewpoint of a Human to Facilitate Human-Centred Innovation (ID 118)</p> <p>Ysanne YEO and Masahiro NIITSUMA</p>	
	<p>A System Dynamics Modeling Framework in the Multi-Project Management for Managed IT Service Providers (ID 132)</p> <p>Bosheng GAO and Zhao ZHANG</p>	
	<p>Impact of data visualization on individual rational decisions (ID 135)</p> <p>M. Midori Sugihara, Ainoa Abella, Jonathan Chacón, Tomiya Kimura, Toma Testuya and Vanja Čok</p>	
	<p>The Impact of Information Sharing on Supply Chain Performance: A Beer Game Simulation Approach to Problem-Based Learning (ID 143)</p> <p>Krisanarach Nitisiri, Thawee Nakrachata-Amona, Thitipong Jamrus, Kanchana Sethanan, and Cathal de Paor</p>	
	<p>Design sustainable products from end-of-life clothes by freshman Engineering students in PBL context (ID 149)</p> <p>Anabela C. Alves and M. Florentina Abreu</p>	

No.	Name (A-I)	Affiliation
1	Adam Cooper	University College London, UK
2	Adrian Ramirez	Tecnológico de Monterrey, Mexico
3	Adriana Guerra	Antonio Nariño University, Columbia
4	Agnese Brunzini	Università Politecnica delle Marche, Italy
5	Amardeep Sidhu	MIT, USA
6	Amy J.C. Trappey	National Tsing Hua University, Taiwan
7	Athakorn Kengpol	King Mongkut's University of Technology North Bangkok
8	Barrett Caldwell	Purdue University, USA
9	Ben Hicks	Bristol University, UK
10	Bryan Moser	MIT, USA
11	Carlos Mario Aldana	Tecnológico de Monterrey, Mexico
12	Cathal de Paor	Mary Immaculate College, Ireland
13	Cees Bil	Royal Melbourne Institute of Technology, Australia
14	Charles Larkin	University of Bath, UK
15	Chen-Yang Cheng	National Taipei University of Technology, Taiwan
16	Chloé Colomer	University College London, UK
17	Christina Choi	Royal College of Art, UK
18	Chun-Hsien Chen	Nanyang Tech. University, Singapore
19	Claire Palmer	Loughborough University, UK
20	Dag Raudberget	Jönköping University, Sweden
21	Daichi Toratani	National Institute of Maritime, Port and Aviation Technology, Electronic Navigation Research Institute, Japan
22	David Rosen	Institute for High Performance Computing, Agency for Science, Technology, and Research, Singapore
23	Duangthida Hussadintorn Na Ayutthaya	Asian Institute of Technology, Thailand
24	Elisa Prati	University of Modena and Reggio Emilia, Italy
25	Elisabeth Lazarou	Politehnica University of Bucharest, Romania
26	Elizabeth Baker	Virginia Commonwealth University, USA
27	Ella-Mae Hubbard	Loughborough University, UK
28	Evripides Loukaides	University of Bath, UK
29	Fabio Grandi	University of Modena and Reggio Emilia, Italy
30	Federico Trigos	Tecnológico de Monterrey, Mexico
31	Francisco Tamayo	Tecnológico de Monterrey, Mexico
32	Fredrik Elgh	Jönköping University, Sweden
33	Gary Linnéusson	Jönköping University, Sweden
34	Giles Sioen	Future Earth Global Hub Japan, Japan
35	Giuditta Contini	University of Modena and Reggio Emilia, Italy
36	Glenn Parry	University of Surrey, UK
37	Ignacio Vazquez	MIT, USA
38	Irina Lazar	University College London, UK

No.	Name (J-P)	Affiliation
39	James Gopsill	Bristol University, UK
40	James Lyneis	MIT, USA
41	Jana Sajdakova	University of Bath, UK
42	Jauhari Khairuddin	Universiti Teknologi Malaysia, Malaysia
43	Jess Robins	University of Bristol, UK
44	Jerzy Pokojski	Warsaw University of Technology, Poland
45	John Bang Mathiasen	Aarhus University, Denmark
46	John P.T. Mo	Royal Melbourne Institute of Technology, Australia
47	Jorge Mendez	Universidad Nacional Autónoma de México, Mexico
48	Jose Ignacio Huertas	Tecnológico de Monterrey, Mexico
49	Josip Stepandic	PROSTEP AG, Germany
50	Julianne McAuliffe	Mary Immaculate College, Ireland
51	Kanchana Sethanan	Khon Kaen University, Thailand
52	Kerstin Johansen	Jönköping University, Sweden
53	Kurt Sandkuhl	University of Rostock, Germany
54	Laurent Liote	University College London, UK
55	Luca Manuguerra	Università Politecnica delle Marche, Italy
56	Luis A. Moncayo-Martinez	ITAM, Mexico
57	Marcello Pellicciari	University of Modena and Reggio Emilia, Italy
58	Marco Mandolini	Università Politecnica delle Marche, Italy
59	Margherita Peruzzini	University of Modena and Reggio Emilia, Italy
60	María Eloísa Pérez-González	Tecnológico de Monterrey, Mexico
61	Mario Doria	Tecnológico de Monterrey, Mexico
62	Martin Lennartsson	Jönköping University, Sweden
63	Melanie King	Loughborough University, UK
64	Mihaela-Elena Ulmeanu	Politehnica University of Bucharest, Romania
65	Milad Ashour Pour	Jönköping University, Sweden
66	Milton Borsato	Federal University of Technology – Parana, Curitiba, Brazil
67	Ming-Chuan Chiu	National Tsing Hua University, Taiwan
68	Nicolai Beisheim	Albstadt-Sigmaringen University, Germany
69	Paraskeva Wlazlak	Jönköping University, Sweden
70	Pietro Bilancia	University of Modena and Reggio Emilia, Italy
71	Pisut Koomsap	Asian Institute of Technology, Thailand

No.	Name (R-Z)	Affiliation
72	Rebecca Grant	Loughborough University, UK
73	Riccardo Karim Khamaisi	University of Modena and Reggio Emilia, Italy
74	Robert Houghton	University of Nottingham, UK
75	Roberto Coronel	Tecnológico de Monterrey, Mexico
76	Roberto Raffaeli	University of Modena and Reggio Emilia, Italy
77	Roland Stolt	Jönköping University, Sweden
78	Rui M. Lima	University of Minho, Portugal
79	Rui Sousa	University of Minho, Portugal
80	Ryota Wada	University of Toyko, Japan
81	Sam Cooper	University of Bath, UK
82	Saraj Gupta	Siemens Energy Inc., USA
83	Sheng-Po Hong	National Tsing Hua University, Taiwan
84	Shingo Kawai	MIT, USA
85	Shinnosuke Wanaka	National Institute of Maritime, Port and Aviation Technology, Electronic Navigation Research Institute, Japan
86	Shuo-Yan Chou	National Taiwan University of Science and Technology, Taiwan
87	Sixiong Peng	University of Toyko, Japan
88	Stefan Wiesner	University of Bremen, Germany
89	Suriya Jirasatitsin	Prince of Songkla University, Thailand
90	Susan Lattanzio	University of Bath, UK
91	Taiga Mitsuyuki	Yokohama National University, Japan
92	Tom Stead	University of Bath, UK
93	Tomasz Nitkiewicz	Częstochowa University of Technology, Poland
94	Vaggelis Giannikas	University of Bath, UK
95	Victor Tang	MIT, USA
96	Vivek Sakhrani	MIT, USA
97	Wim Verhagen	Royal Melbourne Institute of Technology, Australia
98	Wojciech Skarka	Silesian University of Technology, Poland
99	Yasuo Ichinose	National Institute of Maritime, Port and Aviation Technology, Electronic Navigation Research Institute, Japan
100	Zhao Zhang	MIT, USA

Transdisciplinary



Reinforcing Non-University Sector at the Tertiary Level in Engineering and Technology to Support Thailand Sustainable Smart Industry

Co-funded by the Erasmus+ Programme of the European Union



Industry 4.0 Competence Development Training Program

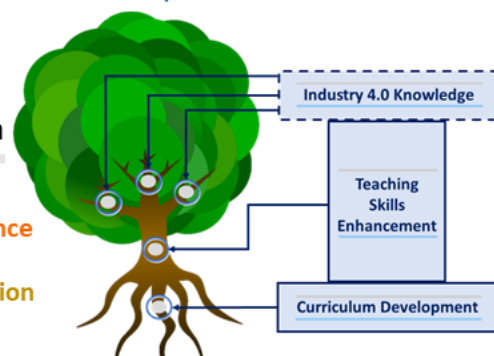
15 Training hours/module



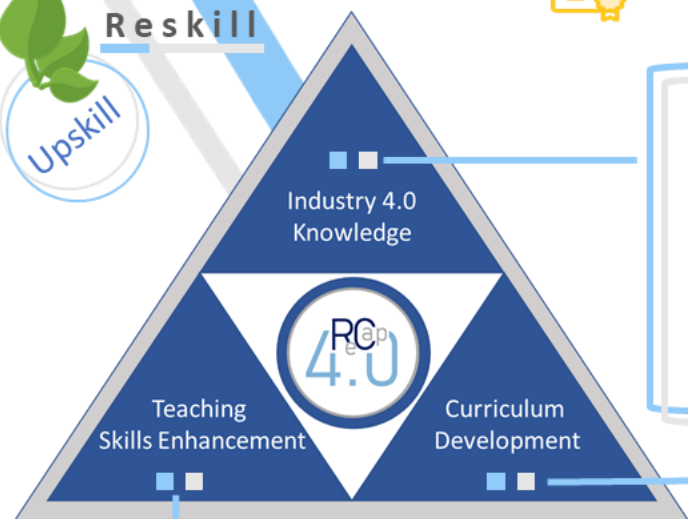
Certificate of Attendance



Certificate of Completion



Reskill



1. Industrial Management in Industry 4.0 Era
2. Applications of Optimization and Technology in Value Chain
3. Digital Manufacturing
4. Innovative Product Design and Development
5. Data Analytics

(Extracted from some of the 16 courses of MSIE 4.0 curriculum)

1. Learning Experience-Focused Course Design and Development

1. Communication and People Skills Development
2. Innovative Teaching and Learning Methods
3. Project-Based and Problem-Based Learning
4. Coaching and Mentoring Skills Development

The training program will be organized at Thai partner universities in different regions of Thailand. Trainees, instructors from the non-university sector at the tertiary level, can attend the training at the universities in their regions. Twelve young Thai lecturers from Thai partner universities will be trained by trainers from EU partner universities on some modules of Industry 4.0 knowledge and teaching skills enhancement. This group of young trainers will help enhancing the competencies of the trainees and sustaining the training program after the project ends.

"Make our educational competence shine a way for generations to come."



Project Number: 619325-EPP-1-2020-1-TH-EPPKA2-CBHE-JP

Partners



A center will be established to be a hub connecting trainers and trainees as well as academic institutes at the tertiary level with industry to sustain the outcomes of ReCap 4.0 as well as [MSIE 4.0](https://www.msie4.ait.ac.th), both Erasmus+ projects.



www.recap4.ait.ac.th



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