Conference Schedule

TE 2022 - The Future of Engineering

Community Social Events
Workshops
Plenary Sessions (Keynotes)
Panels and Posters
Parallel Session (Papers)
ISTE Sessions

* optional activities, including dinner out with students and local tours, are not included in the registration fee. Please bring cash or credit card to pay for your own meal and entrance fees. Please sign up for these activities at registration tables at building E51 1st floor.

Cambridge MA, USA	2022-07-05 Tue	2022-07-06 Wed		2022-07-07 Thu		2022-07-08 Fri	Engineering Teamwork Experiments Slot 4 (7am - 9am)	2022-07-09 Sat
8:00				**ISTE Council** Breakfast **Linda Newnes**				
8:30		**Conference Kick Off** **Bryan Moser**, MIT, TE2022 Chair **Dan Hastings**, MIT School of Engineering						
9:00		Keynote: **Amitava "Babi" Mitra** **Is Engineering Education Delivering? Cross-departmental Engineering Education at MIT**		Keynote: **Olivier de Weck** **Technology Roadmapping and Development**		Keynote: **Christine Oriz** **Socially-Directed Science and Technology**		
9:30								
10:00	**Tech Visits** CIC Ginkgo (pre-registration required) MIT Campus tour	Parallel Session 1	Engineering Teamwork Experiments Slot 1	Parallel Session 4	Engineering Teamwork Experiments Slot 2	Parallel Session 8	Engineering Teamwork Experiments Slot 5	**Local Tour visits** Museum of Science Museum of Fine Arts Isabelle Steward Gardner Duck Tour*
10:30								
11:00		Parallel Session 2		Parallel Session 5		Parallel Session 9		
11:30								
12:00		*Lunch*		*Lunch*		*Lunch*		
12:30								
13:00	**Workshops** (MIT building E51 1st floor) (pre-registration requested)	Panel 1 **The Future of Engineering Education** Babi Mitra, MIT		Panel 2 **Digital Transformation: Opportunities for Evolving Engineering as a Transdisciplinary Practice** Donna Rhodes, MIT		Panel 3 **Trandisciplinarity and Research on Engineering** Paul Grogan, Stevens		
13:30								
14:00		*break*		*break*		*break*		
14:15		Parallel Session 3		Parallel Session 6	Engineering Teamwork Experiments Slot 3	Parallel Session 10		
15:00				Dialgoue on **Service Science and Technology,** Vic Tang				
15:15		**Poster Sessions**	*coffee break*			**Annual General Meeting** of ISTE (AGM)		
16:00				*coffee break*				
16:15		Keynote: **Ruth Graham** **COVID-19: A Catalyst for Change in Global Engineering Education**		Keynote: **Chandrakant D. Patel** **The Rise of the T-Shaped: Multidisciplinary depth and breadth in light of cyber-physical-human systems**		**Closing Ceremony**		
17:00								
17:15				Keynote: **Richard de Neufville** **Flexibility in System Design: A Change in Engineering Paradigm**				
	Welcome Reception (MIT Sailing Pavilion)	**Networking Event** (MIT Welcome Center) Welcome by Joan Rubin, MIT SDM						
18:00								
18:15								
19:00				**Gala Dinner** Samberg Center 7th Floor **Wes Harris,** National Academy of Engineeirng, welcome Awards		*Dinner out (students guide)**		
		*Dinner out (students guide)**						
20:00								
21:00								

Conference Schedule

TE 2022 - Future of Engineering - WED July 6th Detail

Keynotes and Panels
In Room A (Wong Auditorium)

- Community Social Events
- Workshops
- Plenary Sessions (Keynotes)
- Panels and Posters
- Parallel Session (Papers)
- ISTE Sessions

8:00								
8:30	**Conference Kick Off** **Bryan Moser**, MIT, TE2022 Chair and **Dan Hastings**, MIT School of Engineering							
9:00								
9:30	Keynote**: Amitava "Babi" Mitra - Is Engineering Education Delivering? Cross-departmental Engineering Education at MIT**							
	break							
10:00		**A**	*Wong Auditorium*	**B**	*E51-149*	**C**	*E51-151*	
	Parallel Session 1	1A-1	11: A Holistic Education for the 21st Century Engineer Based on Wisdom and Multiplexity. Junaid Qadir	1B-1	67: A Cross-Functional Approach to Metal Additive Manufacturing in Enterprise. Khaalid McMillan, Mehdi Hamid, John Torok, Anthony Tiano, Kyle Olson and James Utter	1C-1	135: Adequate Method Selection for Quantifying Verbal Knowledge in Context of Composite Manufacturing. Markus Edwin Schatz	
10:30		1A-2	4: A Transdisciplinary Framework for Engineering Education, Developing Tactical Engineering Decision Making Skills. Federico Trigos Salazar and Francisco Tamayo	1B-2	86: An investigation into additively manufacturable latticed packaging for fresh produce. Wen Qi Seng, Xue Ting Song, Jo-Yu Kuo and Chun-Hsien Chen	1C-2	56: Object-Oriented Ontology Enterprise Architecture Framework Supporting Enterprise Knowledge Integration. Min-Hua Chao, Amy Trappey and Neil K.T. Chen	
		1A-3	38: Learner-Centered Design of Online Courses: A Transdisciplinary Systems Engineering Case Design. Cassandra M. McCormack and Barrett S. Caldwell	1B-3	10: Challenges of a transdisciplinary team in the design of a lithium-ion battery pack for small urban electric vehicles: Lessons learned. Samuel Henrique Werlich, Joelton Deonei Gotz, Fernanda Cristina Corrêa and Milton Borsato	1C-3	58: Identifying and Reusing Expert Knowledge, a Practical Study of Design Patterns. Samuel Russell, Dinesh Verma, Robert Cloutier and Benjamin Kruse	Engineering Teamwork Experiments Slot 1 Mars Star City
11:00		**A**		**B**		**C**		
	Parallel Session 2	2A-1	88: The New Engineering Education Transformation Program at Massachusetts Institute of Technology: The Evolving Design and Implementation of a Programmatic Evaluation Study. Rea Lavi and Katerina Bagiati	2B-1	107: UX evaluation of a tractor cabin digital twin using mixed reality. Sara Cavallaro, Elisa Prati, Fabio Grandi, Giancarlo Mangia, Marcello Pellicciari and Margherita Peruzzini	2C-1	78: Integrated patent landscape analysis based on semiconductor infringement landmark cases. C.H. Chien, Kevin L.K. Tu, H.J. Lin and A.J.C. Trappey	
11:30		2A-2	26: Utilizing Transdisciplinary Project-Based Learning in Undergraduate Engineering Education. Lacey Davis and Barrett Caldwell	2B-2	139: Multi-objective optimization of composite structure using rule-based parametrization. Wojciech Skarka and Michał Sobota	2C-2	9: Requirements Handling in Multidisciplinary Product Development – A Company Study. Roland Stolt and Samuel André	
		2A-3	103: Student Learning Journey Map: A Design Toolkit for Enriching Learning Experience. Duangthida Hussadintorn Na Ayutthaya and Pisut Koomsap	2B-3	136: Simulation model of solar powered UAV. Krzysztof Mateja and Wojciech Skarka	2C-3	43: Usability Evaluation of Elder-Friendly Design: Application to Take Alipay App. Yan Xiang, Danni Chang, Ying Yao, Leqi Wang, Anqi Chen and Jiajie Li	
12:00	*Lunch*							
13:00	Panel 1: **The Future of Engineering Education** Babi Mitra, MIT							
14:00	*break*							
14:15		**A**	*Wong Auditorium*	**B**	*E51-149*	**C**	*E51-151*	
	Parallel Session 3	3A-1	77: Mental States and Cognitive Performance Monitoring for User-Centered e-Learning System: A Case Study. Ziqing Xia, Cherng En Lee, Chun-Hsien Chen, Jo-Yu Kuo and Kendrik Yan Hong Lim	3B-1	2: Modelling for the UK's utility-scale solar regulation change: Lessons for transdisciplinary engineering in policy practice. Laurent Liote	3C-1	32: Generating Customer Requirement-based Design Strategies For B-to-B Customized Product Configuration Service. Lee Ching-Hung, Li Li and Li Fan	
		3A-2	125: Dropout Prediction by Interpretable Machine Leaning Model towards Preventing Student Dropout. Miki Katsuragi and Kenji Tanaka	3B-2	41: Systems Engineering for Innovation Portfolio Management in the Energy Industry. R. Chadwick Holmes, Zhao Zhang, Sandra Saldaña, Brad Mallison and Jason Francis	3C-2	138: A transdisciplinary approach for requirements engineering from natural language and their chaining toward CAD models. Alain-Jérôme Fougeres, Egon Ostrosi and Josip StjepandiĆ	
15:00		3A-3	106: A discussion on Sustainability in Engineering Education: observations at a Brazilian university. Grazielle Fatima Gomes Teixeira, Osiris Canciglieri Junior and Anderson Luis Szejka	3B-3	117: A transdisciplinary spatial approach to creating a vibrant entrepreneurial ecosystem for regional development. Carlos Mario Aldana, Miguel Angel Rodríguez and Teofilo Ozuna Jr	3C-3	34: A study of the Application of Design Assets in Product Development. Dag Raudberget, Fredrik Elgh, Martin Lennartsson and Rohith Areth Koroth	
15:15	Poster Sessions					*coffee break*		
16:00								
16:15	Keynote**: Ruth Graham - COVID-19: A Catalyst for Change in Global Engineering Education**							
17:00								
17:15								
18:00	**Networking Event** (MIT Welcome Center)							
19:00								
20:00	*Dinner out (students guide, sign-up requested)*							
21:00								

Conference Schedule

TE 2022 - Future of Engineering - THU July 7th Detail

Keynotes and Panels In Room A (Wong Auditorium)

- Community Social Events
- Workshops
- Plenary Sessions (Keynotes)
- Panels and Posters
- Parallel Session (Papers)
- ISTE Sessions

8:00 — **ISTE Council** Breakfast
Linda Newnes
(E51 1st floor and E51-151)

9:00 — Keynote**: Olivier de Weck - Technology Roadmapping and Development**

break

10:00

	A	*Wong Auditorium*	B	*E51-149*	C	*E51-151*
Parallel Session 4	4A-1	17: Digital tools for supporting production preparation: reflections related to designing human robot collaboration layouts. Kerstin Johansen and Sten Grahn	4B-1	91: Digital visualisation tools to bridge communication across manufacturing – a transdisciplinary journey. Pernille Clausen and John Bang Mathiasen	4C-1	84: A co-creative approach for the commercialization of offshore methane hydrate resources. Kenya Suzuki, Ryota Wada, Yoshihiro Konno, Kazuo Hiekata and Sadao Nagakubo
	4A-2	140: Characterizing Model Confidence in a Multi-stakeholder Modeling and Simulation Environment. Ashish Chaudhari, Eric Rebentisch and Donna Rhodes	4B-2	20: An Approach for the Incremental Update of a Digital Twin of a Process Plant. Josip Stjepandic, Johannes Luetzenberger, Philipp Kremer and Frank Müller	4C-2	70: International regulation design for reduction of GHG emission in maritime shipping by agent-based simulation. Kazuho Nonomura, Kazuo Hiekata and Junki Yoshida
	4A-3	153: Digital technologies to redesign automatic machines with a human-centric approach: application in industry. Fabio Grandi, Margherita Peruzzini, Riccardo Karim Khamaisi, Jacopo Lettori and Marcello Pellicciari	4B-3	68: Machine learning and digital twin-based path planning for AGVs at automated container terminals. Yinping Gao, Chun-Hsien Chen, Daofang Chang, Songlin Chen and Xue Ting Song	4C-3	102: A Design Method to Achieve Decarbonisation in Airports with Battery Operation Algorithm Considering Uncertainties. Taihei Matsumoto and Kenji Tanaka

11:00

	A		B		C	
Parallel Session 5	5A-1	64: A Supply Chain Model for Supplying Food Materials to Kodomo-Shokudo by Utilizing Food Loss and Waste. Kayoko Narazaki, Tomiya Kimura, Mizuho Sato, Tetsuya Toma and Midori Sugihara	5B-1	46: Transdisciplinary evaluation of simulation software for Industry 4.0 assembly lines. Jacopo Lettori, Milton Borsato, Roberto Raffaeli, Marcello Pellicciari, Fabio Grandi and Margherita Peruzzini	5C-1	73: A Model-Based Hybrid System for Human Resource Allocation in Multi-Project Management. Mst Taskia Khatun and Kazuo Hiekata
	5A-2	71: Engineering Systems Design Capabilities for a Resilient Green Transformation. Josef Oehmen, Pelle Willumsen and Andy Mattulat Filipovic	5B-2	21: Conceptual Approach for a Digital Twin of Medical Devices. Josip Stjepandic, Roberto Antonio Riascos Castaneda, Egon Ostrosi and Jean-Claude Sagot	5C-2	5: Managing integrated research programmes: Lessons from governance theory, management studies, and organizational economics. Mark Wever, Alvaro Romera, Nel Wognum and Munir Shah
	5A-3	62: Human Cognitive Experiment and Comparison on Waste Segmentation Standards. Yu-Chi Lee, Ching-Hung Lee and Ruah Younes	5B-3	92: Conceptual Design of Space Missions Integrated with Real-Time In Situ Sensors. Brian Chell, Matthew J. LeVine, Leigha Capra, Jerry J. Sellers and Paul T. Grogan	5C-3	112: An approach to determine similarity and critical path of functions for conceptual design of complex products. José Roberto Lobo, Anderson Szejka and Osiris Canciglieri Junior

12:00 — *Lunch*

13:00 — Panel 2: **Digital Transformation: Opportuniti**es for Evolving Engineering **as a Transdisciplinary Practice**
Donna Rhodes, MIT

14:00 — *break*

14:15

	A	*Wong Auditorium*	B	*E51-149*	C	*E51-151*
Parallel Session 6	6A-1	94: Adapting Concept of Operations Analysis for Digital Transformation. Joana L F P Cardoso, Eric Rebentisch, Donna H Rhodes and António L Soares	6B-1	59: Use of Semantic Web Technologies to Enable System Level Verification in Multi-Disciplinary Models. Daniel Dunbar, Thomas Hagedorn, Mark Blackburn and Dinesh Verma	6C-1	19: A study on the more effective delivery system combined with the ethical value of customers. Cheng-Yu Hung, Shingo Iijima, Kenji Tanaka and Daishi Sagawa
	6A-2	52: A Survey of Artificial-Intelligence-Enabled Digital Transformation in Elderly Healthcare Services. Lee Ching-Hung, Chang Wang, Fan Li and Ruah Younes	6B-2	118: Simultaneous interdisciplinary teamwork on digital twins in a 3D collaborative environment. Nicolai Beisheim, Markus Linde, Tobias Ott, Sebastian Amann, Matthias Rädle, Julian Reichwald and Kevin Kastner	6C-2	150: Cost-optimal pathfinding model for multi-echelon logistics network design and optimization: A fourth-party logistics (4PL) perspective. Kendrik Yan Hong Lim, Le Van Dang, Chun-Hsien Chen and Kim Hoe Chew
15:00	6A-3	100: Integrating Quality Aspect in Service Performance Evaluation for Ease of Service. Thuangporn Charoenchokdilok and Pisut Koomsap	6B-3	141: Data-driven and real-time prediction models for products with highly iterative design processes. Mohammad Arjomandi Rad, Dag Raudberget and Roland Stolt	6C-3	44: Data-driven Reserve Personnel Placement to Balance Operation Default Risk and Resource Utility. Yuki Matsuda and Kenji Tanaka

15:15

	A		B		C	
Parallel Session 7	7A	**Community Dialogue: Service Science and Technology** Vic Tang	7B-1	TBD	7C-1	TBD
				coffee break		

16:00

16:15 — Keynote: **Chandrakant D. Patel - The Rise of the T-Shaped: Multidisciplinary depth and breadth in light of cyber-physical-human systems**

17:00

17:15 — Keynote: **Richard de Neufville - Flexibility in System Design: A Change in Engineering Paradigm**

18:00

18:15 — **Gala Dinner**
Samberg Center 7th Floor

19:00

Wes Harris, National Academy of Engineeirng, welcome

20:00

Awards

Engineering Teamwork Experiments Slot 2

Mars Star City

Engineering Teamwork Experiments Slot 3

Mars Star City or Zero Emission Maritime Transportation

Conference Schedule

TE 2022 - Future of Engineering - FRI Jul 8th Detail

Keynotes and Panels In Room A (Wong Auditorium)

- Community Social Events
- Workshops
- Plenary Sessions (Keynotes)
- Panels and Posters
- Parallel Session (Papers)
- ISTE Sessions

8:00

8:30

9:00

Keynote: **Christine Oriz - Socially-Directed Science and Technology**

Engineering Teamwork Experiments Slot 4 (7:00 - 9:00) Mars Star City

break

10:00

Parallel Session 8

	A	*Wong Auditorium*	B	*E51-149*	C	*E51-151*
	8A-1	15: Engineering Tools as Boundary Objects between Product Development and Production. Daniel Hussmo, Kristina Säfsten and Paraskeva Wlazlak	8B-1	45: A Simulation of an Incentive Based Human Flow Navigation in Cities. Ko Oshima, Daishi Sagawa, Tomoki Inoue, Michael Dziomba and Kenji Tanaka	8C-1	3: Transdisciplinary Credit Allocation Policy to Foster Regional Economic Development through Financial Institutions. Federico Trigos and Carlos Mario Aldana
	8A-2	119: The Future of Systems Engineering: Realizing the Systems Engineering Vision 2035. William Miller	8B-2	55: Exploring the technical platform in industrialized house-building for robust product architecture. Martin Lennartsson, Dag Raudberget, Fredrik Elgh and Rohith Areth Koroth	8C-2	28: Transdisciplinary technology mining of advanced 6G satellite communication innovations. A.J.C. Trappey, Andy Z.C. Huang, Neil K.T. Chen, Regan J.S. Pa, C.V. Trappey, K.A. Li and L.P. Hung
	8A-3	85: A New Approach to Break-in and Fit Adaptation. Shuichi Fukuda and Tetsuya Toma	8B-3	149: Mapping the Realities of Smart Urbanism: A Method to Promote Transdisciplinary Smart City Approaches. Will Brown	8C-3	36: Transdisciplinary Evaluation Metrics for the Usability of Wearable Chairs. Yingyi Li and Jing Gan

Engineering Teamwork Experiments Slot 5 Mars Star City

11:00

Parallel Session 9

	A		B		C	
	9A-1	47: Perceptions of Transdisciplinary Engineering: Characterisations of The Transdisciplinary Research Approach. Hannah Gooding, Susan Lattanzio, Glenn Parry and Linda Newnes	9B-1	75: Pattern recognition and oxidation classification in metal structures of industrial roofs using artificial intelligence. João Claudio Nogueira, Fabio Hadano, Fernando Deschamps, Alessandro Marques, Alan Teodoro and Pablo David Valle	9C-1	133: Analysis of the motivations for why people chose to be involved with COVID-19 projects. Jana Sajdakova, Linda Newnes, Emily Carey and Vimal Dhokia
	9A-2	83: Understanding Transdisciplinary Engineering in public policy: a survey of policy actors on the benefits and challenges of engineering expertise for policy. Adam Cooper, Anete Vingre, Billy Bryan, Marine Shah, Shane McHugh and Rita Cimatti	9B-2	14: A systematic literature review of user experience evaluation methods for Human-Robot Interaction. Elisa Prati, Simone Borsci, Margherita Peruzzini and Marcello Pellicciari	9C-2	152: Community biology labs in practice: A Pasteur's quadrant perspective. Ibrahim Aldulijan, Nisa Asgarali-Hoffman, Foad Hamidi, Lydia Stamato, Justice Walker, Mo Mansouri and Lisa Scheifele
	9A-3	95: Measuring characteristics and influence of fluctuating teamwork processes based on natural language processing: the relationship between equal participation and creativity. Sixiong Peng and Katsuya Torii	9B-3	8: An approach towards operationalization of modularization interfaces for industrial product development. Dan Lennartsson, Dag Raudberget, Ulf Seigerroth and Kurt Sankuhl	9C-3	72: European Union Conceptualisation of Industry 5.0: Opportunities and Challenges for Transdisciplinary Engineering. Susan Lattanzio, Mey Goh, Robert Houghton, Linda Newnes and Aida Garcia Lazaro

12:00

Lunch

13:00

Panel 3: **Transdisciplinarity and Research on Engineering**
Paul Grogan, Stevens Institute of Technology

14:00

break

14:15

Parallel Session 10

	A	*Wong Auditorium*	B	*E51-149*	C	*E51-151*
	10A-1	24: Reducing the "Fog of Uncertainty" Surrounding Humanitarian Aid and Disaster Response Operations. Winifred Chen, Nicholas Houghton and Barrett Caldwell	10B-1	127: Instrumenting Weick's seven sensemaking properties to measure collective sensemaking in engineering teams: a study to map concepts to situations. Ignacio Vazquez, Fahim Faruque and Bryan Moser	10C-1	137: A transdisciplinary approach to a Manufacturing problem with a Machine Learning solution. Peter Wilson, Mey Goh, Peter Kinnell, Andrew Walpole and Chris Pretty
	10A-2	16: Doing transdisciplinary studies through the lens of Intervention Based Research. John Bang Mathiasen and Pernille Clausen	10B-2	97: Generic User Interface for Inclusive Interactive Simulation. Ira Winder and Kazuo Hiekata	10C-2	60: Preliminary Evolutionary Network Model for Efficient Collaboration in Systems-of-Systems. Myron Boyd, Thomas Mazzuchi and Shahram Sarkani
15:00	10A-3	37: Effects of Information Exchange Methods on Perceived Risk and Trust in Digital Engineering. Alkim Avsar, Stephanie Chiesi and Paul Grogan	10B-3	54: Team Performance Measurement by Pulse Survey Results of Corporate Planning Members. Tomiya Kimura, Mayu Takaramoto, Tetsuya Toma, Masako Toriya and Midori Sugihara	10C-3	22: Design for Producibility: A Case Study on Theory, Practice and Gaps. Rohith Areth Koroth, Fredrik Elgh, Martin Lennartsson and Dag Raudberget

15:15

Annual General Meeting of ISTE
(AGM)

16:00

16:15

Closing Ceremony

17:00

ISTE 2022 - Future of Engineering - Paper Index

Paper #	Parallel Session	Day	Time	Authors	Title
2	**3B-1**	WED	2:15 PM	Laurent Liote	Modelling for the UK's utility-scale solar regulation change: Lessons for transdisciplinary engineering in policy practice
3	**8C-1**	FRI	10:00 AM	Federico Trigos and Carlos Mario Aldana	Transdisciplinary Credit Allocation Policy to Foster Regional Economic Development through Financial Institutions
4	**1A-2**	WED	10:00 AM	Federico Trigos Salazar and Francisco Tamayo	A Transdisciplinary Framework for Engineering Education, Developing Tactical Engineering Decision Making Skills
5	**5C-2**	THU	11:00 AM	Mark Wever, Alvaro Romera, Nel Wognum and Munir Shah	Managing integrated research programmes: Lessons from governance theory, management studies, and organizational economics
8	**9B-3**	FRI	11:00 AM	Dan Lennartsson, Dag Raudberget, Ulf Seigerroth and Kurt Sankuhl	An approach towards operationalization of modularization interfaces for industrial product development
9	**2C-2**	WED	11:00 AM	Roland Stolt and Samuel André	Requirements Handling in Multidisciplinary Product Development – A Company Study
10	**1B-3**	WED	10:00 AM	Samuel Henrique Werlich, Joelton Deonei Gotz, Fernanda Cristina Corrêa and Milton Borsato	Challenges of a transdisciplinary team in the design of a lithium-ion battery pack for small urban electric vehicles: Lessons learned
11	**1A-1**	WED	10:00 AM	Junaid Qadir	A Holistic Education for the 21st Century Engineer Based on Wisdom and Multiplexity
14	**9B-2**	FRI	11:00 AM	Elisa Prati, Simone Borsci, Margherita Peruzzini and Marcello Pellicciari	A systematic literature review of user experience evaluation methods for Human-Robot Interaction
15	**8A-1**	FRI	10:00 AM	Daniel Hussmo, Kristina Säfsten and Paraskeva Wlazlak	Engineering Tools as Boundary Objects between Product Development and Production
16	**10A-2**	FRI	2:15 PM	John Bang Mathiasen and Pernille Clausen	Doing transdisciplinary studies through the lens of Intervention Based Research
17	**4A-1**	THU	10:00 AM	Kerstin Johansen and Sten Grahn	Digital tools for supporting production preparation: reflections related to designing human robot collaboration layouts
19	**6C-1**	THU	2:15 PM	Cheng-Yu Hung, Shingo Iijima, Kenji Tanaka and Daishi Sagawa	A study on the more effective delivery system combined with the ethical value of customers
20	**4B-2**	THU	10:00 AM	Josip Stjepandic, Johannes Luetzenberger, Philipp Kremer and Frank Müller	An Approach for the Incremental Update of a Digital Twin of a Process Plant
21	**5B-2**	THU	11:00 AM	Josip Stjepandic, Roberto Antonio Riascos Castaneda, Egon Ostrosi and Jean-Claude Sagot	Conceptual Approach for a Digital Twin of Medical Devices
22	**10C-3**	FRI	2:15 PM	Rohith Areth Koroth, Fredrik Elgh, Martin Lennartsson and Dag Raudberget	Design for Producibility: A Case Study on Theory, Practice and Gaps
24	**10A-1**	FRI	2:15 PM	Winifred Chen, Nicholas Houghton and Barrett Caldwell	Reducing the "Fog of Uncertainty" Surrounding Humanitarian Aid and Disaster Response Operations
26	**2A-2**	WED	11:00 AM	Lacey Davis and Barrett Caldwell	Utilizing Transdisciplinary Project-Based Learning in Undergraduate Engineering Education
28	**8C-2**	FRI	10:00 AM	A.J.C. Trappey, Andy Z.C. Huang, Neil K.T. Chen, Regan J.S. Pa, C.V. Trappey, K.A. Li and L.P. Hung	Transdisciplinary technology mining of advanced 6G satellite communication innovations
32	**3C-1**	WED	2:15 PM	Lee Ching-Hung, Li Li and Li Fan	Generating Customer Requirement-based Design Strategies For B-to-B Customized Product Configuration Service
34	**3C-3**	WED	2:15 PM	Dag Raudberget, Fredrik Elgh, Martin Lennartsson and Rohith Areth Koroth	A study of the Application of Design Assets in Product Development
36	**8C-3**	FRI	10:00 AM	Yingyi Li and Jing Gan	Transdisciplinary Evaluation Metrics for the Usability of Wearable Chairs
37	**10A-3**	FRI	2:15 PM	Alkim Avsar, Stephanie Chiesi and Paul Grogan	Effects of Information Exchange Methods on Perceived Risk and Trust in Digital Engineering
38	**1A-3**	WED	10:00 AM	Cassandra M. McCormack and Barrett S. Caldwell	Learner-Centered Design of Online Courses: A Transdisciplinary Systems Engineering Case Design
41	**3B-2**	WED	2:15 PM	R. Chadwick Holmes, Zhao Zhang, Sandra Saldaña, Brad Mallison and Jason Francis	Systems Engineering for Innovation Portfolio Management in the Energy Industry
43	**2C-3**	WED	11:00 AM	Yan Xiang, Danni Chang, Ying Yao, Leqi Wang, Anqi Chen and Jiajie Li	Usability Evaluation of Elder-Friendly Design: Application to Take Alipay App
44	**6C-3**	THU	2:15 PM	Yuki Matsuda and Kenji Tanaka	Data-driven Reserve Personnel Placement to Balance Operation Default Risk and Resource Utility
45	**8B-1**	FRI	10:00 AM	Ko Oshima, Daishi Sagawa, Tomoki Inoue, Michael Dziomba and Kenji Tanaka	A Simulation of an Incentive Based Human Flow Navigation in Cities
46	**5B-1**	THU	11:00 AM	Jacopo Lettori, Milton Borsato, Roberto Raffaeli, Marcello Pellicciari, Fabio Grandi and Margherita Peruzzini	Transdisciplinary evaluation of simulation software for Industry 4.0 assembly lines
47	**9A-1**	FRI	11:00 AM	Hannah Gooding, Susan Lattanzio, Glenn Parry and Linda Newnes	Perceptions of Transdisciplinary Engineering: Characterisations of The Transdisciplinary Research Approach
52	**6A-2**	THU	2:15 PM	Lee Ching-Hung, Chang Wang, Fan Li and Ruah Younes	A Survey of Artificial-Intelligence-Enabled Digital Transformation in Elderly Healthcare Services
54	**10B-3**	FRI	2:15 PM	Tomiya Kimura, Mayu Takaramoto, Tetsuya Toma, Masako Toriya and Midori Sugihara	Team Performance Measurement by Pulse Survey Results of Corporate Planning Members
55	**8B-2**	FRI	10:00 AM	Martin Lennartsson, Dag Raudberget, Fredrik Elgh and Rohith Areth Koroth	Exploring the technical platform in industrialized house-building for robust product architecture
56	**1C-2**	WED	10:00 AM	Min-Hua Chao, Amy Trappey and Neil K.T. Chen	Object-Oriented Ontology Enterprise Architecture Framework Supporting Enterprise Knowledge Integration
58	**1C-3**	WED	10:00 AM	Samuel Russell, Dinesh Verma, Robert Cloutier and Benjamin Kruse	Identifying and Reusing Expert Knowledge, a Practical Study of Design Patterns
59	**6B-1**	THU	2:15 PM	Daniel Dunbar, Thomas Hagedorn, Mark Blackburn and Dinesh Verma	Use of Semantic Web Technologies to Enable System Level Verification in Multi-Disciplinary Models
60	**10C-2**	FRI	2:15 PM	Myron Boyd, Thomas Mazzuchi and Shahram Sarkani	Preliminary Evolutionary Network Model for Efficient Collaboration in Systems-of-Systems
62	**5A-3**	THU	11:00 AM	Yu-Chi Lee, Ching-Hung Lee and Ruah Younes	Human Cognitive Experiment and Comparison on Waste Segmentation Standards
64	**5A-1**	THU	11:00 AM	Kayoko Narazaki, Tomiya Kimura, Mizuho Sato, Tetsuya Toma and Midori Sugihara	A Supply Chain Model for Supplying Food Materials to Kodomo-Shokudo by Utilizing Food Loss and Waste
67	**1B-1**	WED	10:00 AM	Khaalid McMillan, Mehdi Hamid, John Torok, Anthony Tiano, Kyle Olson and James Utter	A Cross-Functional Approach to Metal Additive Manufacturing in Enterprise
68	**4B-3**	THU	10:00 AM	Yinping Gao, Chun-Hsien Chen, Daofang Chang, Songlin Chen and Xue Ting Song	Machine learning and digital twin-based path planning for AGVs at automated container terminals
70	**4C-2**	THU	10:00 AM	Kazuho Nonomura, Kazuo Hiekata and Junki Yoshida	International regulation design for reduction of GHG emission in maritime shipping by agent-based simulation
71	**5A-2**	THU	11:00 AM	Josef Oehmen, Pelle Willumsen and Andy Mattulat Filipovic	Engineering Systems Design Capabilities for a Resilient Green Transformation
72	**9C-3**	FRI	11:00 AM	Susan Lattanzio, Mey Goh, Robert Houghton, Linda Newnes and Aida Garcia Lazaro	European Union Conceptualisation of Industry 5.0: Opportunities and Challenges for Transdisciplinary Engineering
73	**5C-1**	THU	11:00 AM	Mst Taskia Khatun and Kazuo Hiekata	A Model-Based Hybrid System for Human Resource Allocation in Multi-Project Management
75	**9B-1**	FRI	11:00 AM	João Claudio Nogueira, Fabio Hadano, Fernando Deschamps, Alessandro Marques, Alan Teodoro and Pablo David Valle	Pattern recognition and oxidation classification in metal structures of industrial roofs using artificial intelligence
77	**3A-1**	WED	2:15 PM	Ziqing Xia, Cherng En Lee, Chun-Hsien Chen, Jo-Yu Kuo and Kendrik Yan Hong Lim	Mental States and Cognitive Performance Monitoring for User-Centered e-Learning System: A Case Study
78	**2C-1**	WED	11:00 AM	C.H. Chien, Kevin L.K. Tu, H.J. Lin and A.J.C. Trappey	Integrated patent landscape analysis based on semiconductor infringement landmark cases
83	**9A-2**	FRI	11:00 AM	Adam Cooper, Anete Vingre, Billy Bryan, Marine Shah, Shane McHugh and Rita Cimatti	Understanding Transdisciplinary Engineering in public policy: a survey of policy actors on the benefits and challenges of engineering expertise for policy

84	**4C-1**	THU	10:00 AM	Kenya Suzuki, Ryota Wada, Yoshihiro Konno, Kazuo Hiekata and Sadao Nagakubo	A co-creative approach for the commercialization of offshore methane hydrate resources
85	**8A-3**	FRI	10:00 AM	Shuichi Fukuda and Tetsuya Toma	A New Approach to Break-in and Fit Adaptation
86	**1B-2**	WED	10:00 AM	Wen Qi Seng, Xue Ting Song, Jo-Yu Kuo and Chun-Hsien Chen	An investigation into additively manufacturable latticed packaging for fresh produce
87	**6B-3**	THU	2:15 PM	Mohammad Arjomandi Rad, Dag Raudberget and Roland Stolt	Data-driven and real-time prediction models for products with highly iterative design processes
88	**2A-1**	WED	11:00 AM	Rea Lavi and Katerina Bagiati	The New Engineering Education Transformation Program at Massachusetts Institute of Technology: The Evolving Design and Implementation of a Programmatic Evaluation Study
91	**4B-1**	THU	10:00 AM	Pernille Clausen and John Bang Mathiasen	Digital visualisation tools to bridge communication across manufacturing – a transdisciplinary journey
92	**5B-3**	THU	11:00 AM	Brian Chell, Matthew J. LeVine, Leigha Capra, Jerry J. Sellers and Paul T. Grogan	Conceptual Design of Space Missions Integrated with Real-Time In Situ Sensors
94	**6A-1**	THU	2:15 PM	Joana L F P Cardoso, Eric Rebentisch, Donna H Rhodes and António L Soares	Adapting Concept of Operations Analysis for Digital Transformation
95	**9A-3**	FRI	11:00 AM	Sixiong Peng and Katsuya Torii	Measuring characteristics and influence of fluctuating teamwork processes based on natural language processing: the relationship between equal participation and creativity
97	**10B-2**	FRI	2:15 PM	Ira Winder and Kazuo Hiekata	Generic User Interface for Inclusive Interactive Simulation
100	**6A-3**	THU	2:15 PM	Thuangporn Charoenchokdilok and Pisut Koomsap	Integrating Quality Aspect in Service Performance Evaluation for Ease of Service
102	**4C-3**	THU	10:00 AM	Taihei Matsumoto and Kenji Tanaka	A Design Method to Achieve Decarbonisation in Airports with Battery Operation Algorithm Considering Uncertainties
103	**2A-3**	WED	11:00 AM	Duangthida Hussadintorn Na Ayutthaya and Pisut Koomsap	Student Learning Journey Map: A Design Toolkit for Enriching Learning Experience
106	**3A-3**	WED	2:15 PM	Grazielle Fatima Gomes Teixeira, Osiris Canciglieri Junior and Anderson Luis Szejka	A discussion on Sustainability in Engineering Education: observations at a Brazilian university
107	**2B-1**	WED	11:00 AM	Sara Cavallaro, Elisa Prati, Fabio Grandi, Giancarlo Mangia, Marcello Pellicciari and Margherita Peruzzini	UX evaluation of a tractor cabin digital twin using mixed reality
112	**5C-3**	THU	11:00 AM	José Roberto Lobo, Anderson Szejka and Osiris Canciglieri Junior	An approach to determine similarity and critical path of functions for conceptual design of complex products
117	**3B-3**	WED	2:15 PM	Carlos Mario Aldana, Miguel Angel Rodríguez and Teofilo Ozuna Jr	A transdisciplinary spatial approach to creating a vibrant entrepreneurial ecosystem for regional development
118	**6B-2**	THU	2:15 PM	Nicolai Beisheim, Markus Linde, Tobias Ott, Sebastian Amann, Matthias Rädle, Julian Reichwald and Kevin Kastner	Simultaneous interdisciplinary teamwork on digital twins in a 3D collaborative environment
119	**8A-2**	FRI	10:00 AM	William Miller	The Future of Systems Engineering: Realizing the Systems Engineering Vision 2035
125	**3A-2**	WED	2:15 PM	Miki Katsuragi and Kenji Tanaka	Dropout Prediction by Interpretable Machine Leaning Model towards Preventing Student Dropout
127	**10B-1**	FRI	2:15 PM	Ignacio Vazquez, Fahim Faruque and Bryan Moser	Instrumenting Weick's seven sensemaking properties to measure collective sensemaking in engineering teams: a study to map concepts to situations
133	**9C-1**	FRI	11:00 AM	Jana Sajdakova, Linda Newnes, Emily Carey and Vimal Dhokia	Analysis of the motivations for why people chose to be involved with COVID-19 projects
135	**1C-1**	WED	10:00 AM	Markus Edwin Schatz	Adequate Method Selection for Quantifying Verbal Knowledge in Context of Composite Manufacturing
136	**2B-3**	WED	11:00 AM	Krzysztof Mateja and Wojciech Skarka	Simulation model of solar powered UAV
137	**10C-1**	FRI	2:15 PM	Peter Wilson, Mey Goh, Peter Kinnell, Andrew Walpole and Chris Pretty	A transdisciplinary approach to a Manufacturing problem with a Machine Learning solution
138	**3C-2**	WED	2:15 PM	Alain-Jérôme Fougeres, Egon Ostrosi and Josip StjepandiĆ	A transdisciplinary approach for requirements engineering from natural language and their chaining toward CAD models
139	**2B-2**	WED	11:00 AM	Wojciech Skarka and Michał Sobota	Multi-objective optimization of composite structure using rule-based parametrization
140	**4A-2**	THU	10:00 AM	Ashish Chaudhari, Eric Rebentisch and Donna Rhodes	Characterizing Model Confidence in a Multi-stakeholder Modeling and Simulation Environment
149	**8B-3**	FRI	10:00 AM	Will Brown	Mapping the Realities of Smart Urbanism: A Method to Promote Transdisciplinary Smart City Approaches
150	**6C-2**	THU	2:15 PM	Kendrik Yan Hong Lim, Le Van Dang, Chun-Hsien Chen and Kim Hoe Chew	Cost-optimal pathfinding model for multi-echelon logistics network design and optimization: A fourth-party logistics (4PL) perspective
152	**9C-2**	FRI	11:00 AM	Ibrahim Aldulijan, Nisa Asgarali-Hoffman, Foad Hamidi, Lydia Stamato, Justice Walker, Mo Mansouri and Lisa Scheifele	Community biology labs in practice: A Pasteur's quadrant perspective
153	**4A-3**	THU	10:00 AM	Fabio Grandi, Margherita Peruzzini, Riccardo Karim Khamaisi, Jacopo Lettori and Marcello Pellicciari	Digital technologies to redesign automatic machines with a human-centric approach: application in industry