TMCE 2020
Preliminary program

Track A – Engineering of smart systems (ESS)

Session A1:   **Characteristics of cyber-physical systems (CCS)**
Time: **Tuesday 12th May 2020, 14:00 – 16:00**
Room A: **Will be specified soon**

[ESS-CCS-1]   29   14:00 – 14:30
Upgrading of legacy systems to cyber-physical systems
Vladimir Kutscher (DE), Johannes Olbort (DE), Oleg Anokhin (DE), Lukas Bambach (DE) and Reiner Anderl (DE)

[ESS-CCS-2]   49   14:30 – 15:00
Information dynamics in the network of cyber-physical systems
Yan Wang (US)

[ESS-CCS-3]   74   15:00 – 15:30
Assurance monitoring of cyber-physical systems with machine learning components
Dimitrios Boursinos (US) and Xenofon Koutsoukos (US)

[ESS-CCS-4]   07   15:30 – 16:00
Analysing the impacts of system obsolescence based on system architecture models
Marc Zolghadri (FR), Rob Vingerhoeds (FR), Claude Baron (FR) and Sophia Salas (FR)

Session A2:   **Realization of smart systems (RSS)**
Time: **Tuesday 12th May 2020, 16:30 – 18:00**
Room A: **Will be specified soon**

[ESS-RSS-1]   72   16:30 – 17:00
Towards a framework of smart detection system (SDS) for quality improvement
Dao Yin (CN), Xinguo Ming (CN), Xianyu Zhang (CN) and Yijian Zheng (CN)

[ESS-RSS-2]   66   17:00 – 17:30
The sign language interpreter on mobile (SLIM) system
Jason Christopher Viljoen (ZA), Duncan Antony Coulter (ZA) and Elizabeth Marie Ehlers (ZA)

[ESS-RSS-3]   71   17:30 – 18:00
Top-level planning of smart system in manufacturing with mass personalization (MMP): System model, application blueprint, application scenarios, and implementation path
Xianyu Zhang (CN), Xinguo Ming (CN) and Siqi Qiu (CN)

Session A3:   **Validation of complex systems (VCS)**
Time: **Wednesday 13th May 2020, 14:00 – 16:00**
Room A: **Will be specified soon**

[ESS-VCS-1]   27   14:00 – 14:30
Validating anomaly detection mechanisms in industrial control systems
Salimah Liyakkathali (SG), Francisco Furtado (SG), Aditya Mathur (SG) and Gayathri Sugumar (SG)

[ESS-VCS-2]   44   14:30 – 15:00
How can a smart cyber-physical system validate its run-time adaptation actions before and after executing them?
Jože Tavčar (SI) and Imre Horváth (NL)

[ESS-VCS-3]   59   15:00 – 15:30
Systematically predicting and validating the emergent behaviour of complex holonic multi-agent systems with real-time strategy games as example
Gerard Gouws (ZA) and Elizabeth Marie Ehlers (ZA)

[ESS-VCS-4]   15   15:30 – 16:00
Smart platform experiment cycle (SPEC) – A validation process for digital platforms
Patrick Brecht (DE), Manuel Niever (DE), Roman Kerres (DE) and Carsten H. Hahn (DE)

Session A4:   Methodologies for smart systems (MSS)
Time: Wednesday 13th May 2020, 16:30 – 18:00
Room A: Will be specified soon

[ESS-MSS-1]   45   16:30 – 17:00
Designing smart systems: Reframing artificial intelligence for human-centered design
Caiseal Beardow (NL), Willem van der Maden (NL) and James Lomas (NL)

[ESS-MSS-2]   55   17:00 – 17:30
Methodologically supported development of digital twins for smart product-service systems
Thomas Eickhoff (DE), Christo Apostolov (DE) and Jens C. Göbel (DE)

[ESS-MSS-3]   79   17:30 – 18:00
Recommendation functionality for a smart data analytics toolbox to support choosing task-relevant data analytics tools
Fatima-Zahra Abou Eddahab (NL) and Imre Horváth (NL)

Session A5:   Sensor and actuation technologies (SAT)
Time: Thursday 14th May 2020, 14:00 – 16:00
Room A: Will be specified soon

[ESS-SAT-1]   32   14:00 – 14:30
Temperature sensor position-planning
David Ross-Pinnock (UK), Glen Mullineux (UK) and Patrick Keogh (UK)

[ESS-SAT-2]   65   14:30 – 15:00
Optimization of circular piezoelectric haptic actuators with a multi-objective optimization
Alexander Reininger (AT), Lukas Grasböck (AT), Daniel Reischl (AT), Astrid Pechstein (AT) and Martin Meindlhumer (AT)

[ESS-SAT-3]   78   15:00 – 15:30
Preliminary study on end-effector compliance in automated fluid coupling for trains
Kourosh Eshraghi (UK), Pingfei Jiang (UK), Daniele Suraci (UK) and Mark Atherton (UK)

[ESS-SAT-4]   77   15:30 – 16:00
Immune inspired smart building sensor maintenance
Hendrik Johannes Carl van der Westhuizen (ZA), Duncan Antony Coulter (ZA) and Elizabeth Marie Ehlers (ZA)

Session A6:   Health care systems (HCS)
Time: Thursday 14th May 2020, 16:30 – 18:00
Room A: Will be specified soon

[ESS-HCS-1]   81   16:30 – 17:00
Health 4.0: Can healthcare industry get smarter?
Eman Abukhousa (AE), Nader Mohamed (US) and Jameela Al-Jaroodi (US)

[ESS-HCS-2]   41   17:00 – 17:30
Using commodity hardware as a diagnostic tool for the detection of Parkinson's disease
Steven Martyn Wessels (ZA) and Duncan Antony Coulter (ZA)

[ESS-HCS-3]   80   17:30 – 18:00
Conceptualization of a smart neck massage device for treatment in daily life environments
Jiming Bai (NL) and Imre Horváth (NL)

Track B – Methodological innovations in engineering (MIE)

Session B1:   Advanced engineering methodologies (AEM)
Time: Tuesday 12th May 2020, 14:00 – 16:00
Room B: Will be specified soon

[MIE-AEM-1]   70   14:00 – 14:30
A methodology for automating assurance case generation
Shreyas Ramakrishna (US), Charles Hartsell (US), Abhishek Dubey (US), Gabor Karsai (US) and Partha Pal (US)

[MIE-AEM-2]   76   14:30 – 15:00
Anchoring points as a method for interdisciplinary systems engineering with the new V-model
Iris Gräßler (DE), Hentze Hentze (DE) and Philipp Hesse (DE)

[MIE-AEM-3]   2   15:00 – 15:30
Industrial case studies for the application of the virtual reality technology within the industrial engineering
Fahmi Bellalouna (DE)

[MIE-AEM-4]   21   15:30 – 16:00
Developing the decision tool to investigate and support the decision behavior in alternative prioritization based on the pairwise-comparison technique and quicksort algorithm
Narucha Tanaiutchawoot (DE), Chenliang Mao (DE), Shuai Liu (DE), Simon Rapp (DE) and Albert Albers (DE)

Session B2:   Risk and impact management (RIM)
Time: Tuesday 12th May 2020, 16:30 – 18:00
Room B: Will be specified soon

[MIE-RIM-1]   69   16:30 – 17:00
Integration of product risk management with configuration management in product lifecycle management
Roberto Antonio Riascos Castaneda (FR), Egon Ostrosi (FR), Tomislava Majić (HR), Jean-Claude Sagot (FR) and Josip Stjepandic (DE)

[MIE-RIM-2]   12   17:00 – 17:30
Determination of the severity of risks in engineering projects using a system architecture approach
Matthew Cook (AU) and John P. T. Mo (AU)

[MIE-RIM-3]   08   17:30 – 18:00
Model-based geometric inspection of polymer spur gears
Uroš Urbas (SI), Damijan Zorko (SI) and Nikola Vukašinović (SI)

Session B3   **Automotive technologies and methodologies (ATM**
Time: **Wednesday 13th May 2020, 14:00 – 16:00**
Room B: **Will be specified soon**

[MIE-ATM-1]   36   14:00 – 14:30
Evaluation of face analysis methods for personalization in driver monitoring systems
Alexey M. Kashevnik (SU) and Anh Pham Tuan (SU)

[MIE-ATM-2]   25   14:30 – 15:00
Generic reference product model for specifying complex products by the example of the automotive industry
Albert Albers (DE), Tobias Hirschter (DE), Joshua Fahl (DE), Gabriel Wöhrle (DE), Jonas Reinemann (DE) and Simon Rapp (DE)

[MIE-ATM-3]   54   15:00 – 15:30
Automotive lightweighting: Design and joining methodologies
Raghu Echempati (US)

[MIE-ATM-4]   24   15:30 – 16:00
Case study: Challenges in maturity level determination for a new body in white application in the automotive industry
Thilo Oliver Richter (DE), Jonas Zechiel (DE), Albert Albers (DE) and Andrea Glas (DE)

Session B4:   **New design approaches (NDA)**
Time: **Wednesday 13th May 2020, 16:30 – 18:00**
Room B: **Will be specified soon**

[MIE-NDA-1]   42   16:30 – 17:00
Effective engineering design to make urban transportation systems perform brilliantly through interactive media
Xiaoxiao Liu (JP), Jing Zhao (JP), Yukari Nagai (JP) and Miao Yu (JP)

[MIE-NDA-2]   75   17:00 – 17:30
Intelligent requirements engineering from natural language and their chaining toward CAD models
Alain-Jérôme Fougères (FR) and Egon Ostrosi (FR)

[MIE-NDA-3]   67   17:30 – 18:00
Design of the design process: 4D design
Yuemin Hou (CN), Linhong Ji (CN) and Michel van Tooren (US)

Session B5:   **Competitive innovative engineering (CIE)**
Time: **Thursday 14th May 2020, 14:00 – 16:00**
Room B: **Will be specified soon**

[MIE-CIE-1]   16   14:00 – 14:30
Smart education concept for product development teams in agile innovation projects
Manuel Niever (DE), Christian Brandstetter (DE), Carsten Hahn (DE), Katharina Duehr (DE), and Albert Albers (DE)

[MIE-CIE-2]   11   14:30 – 15:00
Investigation of the influence of the sources of reference system elements on the innovation potential and engineering effort of product profiles
Florian Marthaler (DE), Simon Rapp (DE), Kimberly Llajaruna Peralta (DE), Moritz Altner (DE), Pranjali Manjarekar (DE), Nikola Bursac (DE) and Albert Albers (DE)

[MIE-CIE-3]   20   15:00 – 15:30
User centric product design strategy for grocery monitoring in Indian context
Leeladhar Ganvir (IN) and Pratul C. Kalita (IN)

[MIE-CIE-4]   38   15:30 – 16:00
Timetable task scheduling with an artificial intelligent agent utilising an iterative replacement and heuristic search methodology
Morne Theron (ZA) and Elizabeth Marie Ehlers (ZA)

Session B6:   **Application-driven knowledge structures (AKC)**
Time: **Thursday 14th May 2020, 16:30 – 18:00**
Room B: **Will be specified soon**

[MIE-AKC-1]   18   16:30 – 17:00
Towards automatic generation of explanation of analogies at various levels of comprehensiveness
Sonal Keshwani (IN) and Amaresh Chakrabarti (IN)

[MIE-AKC-2]   23   17:00 – 17:30
LDA models for objective validation in the early phase of product development
Thilo Oliver Richter (DE), Wei H. Wong (DE) and Albert Albers (DE)

[MIE-AKC-3]   37   17:30 – 18:00
Linking building design and the digital factory by graph-based design languages
Christopher Voss (DE), Frank Petzold (DE) and Stephan Rudolph (DE)

Track C – Novel challenges of engineering (NCE)

Session C1   **Computational frameworks and tools (CFM)**
Time: **Tuesday 12th May 2020, 14:00 – 16:00**
Room C: **Will be specified soon**

[NCE-CFT-1]   13   14:00 – 14:30
A case-based multistage framework for manufacturability optimization
Zhi Li (CN), Danchen Zhou (CN) and Bo Zhang (CN)

[NCE-CFT-2]   61   14:30 – 15:00
Integration of complex event processing into multi-agent systems: Two use cases for distributed software development support
Tobias Eichler (DE), Susanne Draheim (DE), Kai von Luck (DE), Christos Grecos (IE) and Qi Wang (UK)

[NCE-CFT-3]   52   15:00 – 15:30
Conceptualization of an active recommendation framework system to support application-driven reasoning mechanism development for smart cyber-physical systems
Sirasak Tepjit (NL), Imre Horváth (NL) and Zoltán Rusák (NL)

[NCE-CFT-4]   58   15:30 – 16:00

A framework for sustainable supply chain practices and barriers for Indian automobile industries: An AHP approach

Aditya Sharma (IN), Rajeev Agrawal (IN) and Anbesh Jamwal (IN)

Session C2:	**Mechatronics and smart structures (MRS)**
Time:	**Tuesday 12th May 2020, 16:30 – 18:00**
Room C:	**Will be specified soon**

[NCE-MSS-1]   35   16:30 – 17:00

Symbiotic mechatronics: An alternative view on complex systems

Klaus Zeman (AT), Franz Jungreitmayr (AT), Azad Khandoker (AT), Rudolf Scheidl (AT), Helmut Wahl (AT), Thomas Buchegger (AT), Rainer Haas (AT), Johann Hoffelner (AT), Stefan Boschert (DE), Roland Rosen (DE), Carsten Aschpurwis (DE) and Bertram Wanner (DE)

[NCE-MSS-2]   19   17:00 – 17:30

Mechatronic machine elements – Approach to develop prototypes based on the signal flow

Stefan Schork (DE), Gunnar Vorwerk-Handing (DE), Sven Vogel (DE) and Eckhard Kirchner (DE)

[NCE-MSS-3]   64   17:30 – 18:00

A summary of piezoelectric energy harvesting for autonomous smart structures

Lukas Grasböck (AT), Alexander Reininger (AT), Manfred Nader (AT), Alexander Humer (AT), Martin Schagerl (AT), Malte Misol (DE), Hans Peter Monner (DE), Sven Herold (DE) and Dirk Mayer (DE)

Session C3:	**Materials and digital technologies (MDT)**
Time:	**Wednesday 13th May 2020, 14:00 – 16:00**
Room C:	**Will be specified soon**

[NCE-MDT-1]   73   14:00 – 14:30

Effect of nano-additives on the hardness of a body armor ceramic

Mohammad A. Shbool (JO)

[NCE-MDT-2]   34   14:00 – 14:30

Post-processing of additive manufactured titanium alloy parts through radial-axial ring rolling

Shubhneet Lakhera (IN), Satwik Priyadarshi (IN) and Puneet Tandon (IN)

[NCE-MDT-3]   63   14:00 – 14:30

Transposing testing from lab to on-site environment: A case of cocaine powder sampling

Joren Van Loon (BE), Mats de Jong (BE), Karolien De Wael (BE) and Els Du Bois (BE)

[NCE-MDT-4]   40   14:00 – 14:30

Predicting the evolution of digital environments

Merrick Bengis (ZA), Duncan Antony Coulter (ZA) and Elizabeth Marie Ehlers (ZA)

Session C4:	**Mathematical problems of engineering (MPE)**
Time:	**Wednesday 13th May 2020, 16:30 – 18:00**
Room C:	**Will be specified soon**

[NCE-MPE-1]   43   16:30 – 17:00

A novel implementation of energy-based homogenization method for periodical material and stiffened plate

Shuzhi Xu (CA) and Yongsheng Ma (CA)

[NCE-MPT-2]   31   17:00 – 17:30

Smooth composite motions

Glen Mullineux (UK), Ben Cross (UK)and Robert J. Cripps (UK)

[NCE-MPE-3]   68   17:30 – 18:00
Cause-effect diagrams transformation to Bayesian networks: Construction and elicitation rules
Fatma Kechaou (FR), Sid-Ali Addouche (FR) and Marc Zolghadri (FR)

Session C5:   Efficient organization and planning (EOP)
Time: Thursday 14th May 2020, 14:00 – 16:00
Room C: Will be specified soon

[NCE-EOP-1]   51   14:00 – 14:30
Perceived importance of engineering requirements based on origin: An experimental study
Chase Wentzky (US), Nicholas Spivey (US), Nicole Zero (US), Maria Vittoria Elena (US) and Joshua D. Summers (US)

[NCE-EOP-2]   60   14:30 – 15:00
Comparison of evolution algorithms coupled with A* search for solving facility layout problem
Mariem Besbes (FR), Marc Zolghadri (FR), Roberta Costa Affonso (FR), Faouzi Masmoudi (TN) and Mohamed Haddar (TN)

[NCE-EOP-3]   04   15:00 – 15:30
Virtual reality-based approach for efficient factory planning
Fahmi Bellalouna (DE)

[NCE-EOP-4]   09   15:30 – 16:00
Smart approach to natural risks management in major hazard industrial plants
Alessandra Marino (IT) and Mariano Ciucci (IT)

Session C6:   Additional topics if engineering (ATE)
Time: Thursday 14th May 2020, 16:30 – 18:00
Room C: Will be specified soon

[NCE-ATE-1]   82   16:30 – 17:00
Industry/Pharma 4.0 - Smart fluid bed granulation process
Luke Kiernan (IR), Caroline McCormack (IR), Chris O'Callaghan (IR), Gareth Clarke (IR), Ian Jones (IR) and Gavin Walker (IR)