Tuesday 5th April

9:30 – 10:30: KEYNOTE LECTURE – Professor Kremer, FAIDRE room

Professor of Engineering Design and Industrial Engineering, The Pennsylvania State University, USA

Although sustainability is a frequent topic in product development and manufacturing literature, the often segmented and narrow scope of prior works limits the potential benefits of the industrial application of methods, models, and tools developed by the research community. Moreover, inconsistent, insufficient consideration of human behavior with regards to sustainability and relevant policy efforts across the globe make the sustainable future a distant dream. This talk is intended to highlight past accomplishments and to be a call for action to the research community for the development of truly integrated methods, models, and tools to support sustainability initiatives across product supply chains. Significant accomplishments spanning product design, manufacturing, and supply operations management reveal critical research needs, which are organized into five highly promising foci addressing product architecture engineering, assembly/disassembly operation modeling, manufacturing process modeling, joint optimization of life cycle activities, and smart sustainability. Potential avenues for future interdisciplinary research will be presented.

11:00 – 13:00 GENERAL INTEREST SESSIONS

General Track 1: Sustainable Design, Innovation & Services. FAIDRE room

11:00 – 11:20; *A new CAD integrated application to support designers and increase design sustainability*
11:20 – 11:40; A Conflict Analysis and Resolution Method Based on Integrating the Extension and TRIZ Methods
11:40 – 12:00; Investigating the Regulatory-push of Eco-Innovations in Brazilian Companies
12:00 – 12:20; Evolutive Scenarios For A New Concept Of Sustainable Mobility
12:20 – 12:40; Implications of Open Source Design for Sustainability
12:40 – 13:00; Sustainable supply chain management in circular economy: towards supply circles

General Track 2: Sustainable Manufacturing Processes & Technologies. ELPIDA room

11:00 – 11:20; Generic Approach to Sustainability Improvements in Manufacturing Ovens
11:20 – 11:40; Increasing energy potentials of air-jet weaving machines by using energy efficiency as a central requirement in the design phase of the weft insertion process
11:40 – 12:00; Modelling and Verification of Energy Consumption in CNC Milling
12:00 – 12:20; Optimal Cutting Parameters to Reduce Power Consumption in Face Milling of Alloy Cast Iron for Environmental Sustainability
12:20 – 12:40; Innovative Active Cross-Linking Agents for Sustainable Leather Manufacturing
12:40 – 13:00; An Approach to Electricity Monitoring and Targeting (M&T) in Irish Precision Engineering SMEs

General Track 3: Sustainable Manufacturing Systems & Enterprises. ARIADNI room

11:00 – 11:20; Product Change Management and Future Information Architectures
11:20 – 11:40; Road-Mapping Towards a Sustainable Lower Energy Foundry
11:40 – 12:00; Increasing Production Efficiency through Electronic Batch Record Systems: A Case Study
12:00 – 12:20; A Method for Understanding Sustainable Design Trade-offs During the Early Design Phase
12:20 – 12:40; Achieving Sustainability in SME Manufacturing Operations via the use of Flexible Integrated Technology and Product Symbiosis
12:40 – 13:00; Sustainable Manufacturing Systems Based on Demand Forecasting ? Supply Chain

14:00 – 15:00: KEYNOTE LECTURE – Dr Bin Song, FAIDRE room

Senior Scientist, Singapore Institute of Manufacturing Technology (SIMTech), Singapore

Remanufacturing is a process to restore used products to as-new status. Studies have found that it recovers the waste materials and preserves the value from original products, and hence is widely recognized as a key enabler for sustainable manufacturing. Along with the intensified emphasis on sustainable development since the beginning of this century, Governments and industry have increasingly recognized the importance and potential of remanufacturing. Systematically planned large-scale research programmes on remanufacturing were arguably initiated from 2011 in Singapore, China, and other parts of the world. The focused research areas of the programmes cover the technological challenges across the life cycle of remanufacturing. Included are methodology and solutions for design for remanufacturing, remanufacturability analysis, inventory management, planning and scheduling as well critical technologies for remaining life estimation of used parts and specific salvaging processes. The state-of-art, and the need for future research are discussed on the major areas deemed essential for the future growth of remanufacturing industry.

15:00 – 16:00 GENERAL INTEREST SESSIONS

General Track 1: Sustainable Design, Innovation & Services. FAIDRE room

15:00 – 15:20; How does sustainability help or hinder innovation? A study of successful companies that were founded on sustainability principles
15:20 – 15:40; A New Sustainable Product Development Model in Apparel Based on 3D Technologies For Virtual Proper Fit
15:40 – 16:00; Fault Status Assessment for Fault Diagnosis of A Multistage Planetary Gear Set Based on Dynamic Simulation and Experimental Analysis

General Track 2: Sustainable Manufacturing Processes & Technologies. ELPIDA room

15:00 – 15:20; Mathematical model of multi-source energy flows for CNC worm wheel grinding machine tools
15:20 – 15:40; Exploring the scope of Industrial Symbiosis: implications for practitioners
15:40 – 16:00; Towards Reverse Logistics Archetypes To Stimulate Manufacturers' Usage Of End Of Life And End Of Use Products

General Track 3: Sustainable Manufacturing Systems & Enterprises. ARIADNI room

15:00 – 15:20; An Analysis of Indirect Water Withdrawal and Consumption in Automotive Manufacturing Facilities
15:20 – 15:40; How are Micro Enterprises Adopting Emergent Technologies?
15:40 – 16:00; Life Cycle Assessment and Life Cycle Costing as supporting tools for EVs lightweight design

16:30 – 18:30 INVITED SESSIONS

Invited Session 1: Design for Additive Manufacture. FAIDRE room

16:30 – 16:50; Application of Sustainable Design in Additive Manufacturing of an Unmanned Aerial Vehicle
16:50 – 17:10; Evaluating Innovative CAD Techniques in the Creation of Conformal Cellular Structures
17:10 – 17:30; An investigation into the quasi-static response of Ti6Al4V lattice structures manufactured using selective laser melting
17:30 – 17:50; A Bottom-up Design Framework for CAD Tools to Support Design for Additive Manufacturing
17:50 – 18:10; A Surface Modification Decision Tree to Influence Design in Additive Manufacturing
18:10 – 18:30; Additive Manufacturing Simulation using Signed Distance Fields

Invited Session 4: Redistributed manufacturing for resilience and sustainability. ELPIDA room

16:30 – 16:50; Can re-distributed manufacturing and digital intelligence enable a regenerative economy? An integrative literature review
16:50 – 17:10; Makespaces: From Redistributed Manufacturing to Circular Economy

17:10 – 17:30; An exploratory study of the resilience of manufacturing in the Cardiff Capital Region
17:30 – 17:50; Design of an Integrated Assessment of Re-distributed Manufacturing for the Sustainable, Resilient City
17:50 – 18:10; Future prospects of Sustainable Aquaculture supply chain practices

Invited Session 5: UK-China forum on innovation for green manufacturing. ARIADNI room

16:30 – 16:50; Application of Multilevel Maturity in Collaborative Development Mode of Aircraft
16:50 – 17:10; A Social Sustainability Assessment Model for Manufacturing Systems Based on Ergonomics and Fuzzy Inference System
17:10 – 17:30; Cloud Manufacturing Service-oriented Platform for Group Enterprises
17:30 – 17:50; Mathematical model of multi-source energy flows for CNC worm wheel grinding machine tools
17:50 – 18:10; Fault Status Assessment for Fault Diagnosis of A Multistage Planetary Gear Set Based on Dynamic Simulation and Experimental Analysis

Wednesday 6th April

9:30 – 10:30: KEYNOTE LECTURE – Dr Andy Clifton, FAIDRE room

Sustainability Manager for Engineering & Design, Rolls-Royce, UK

Our world is changing, populations are increasing. We need more power but not at any cost to society. The world needs better power. At Rolls-Royce we believe that advanced engineering has a critical role to play in meeting the environmental and societal challenges the world faces. Our vision is to deliver better power for a changing world.
In the past, the main focus of improving a product's life cycle has been to increase use phase efficiency. However, times are changing and stakeholder concerns now span a wider range of impacts and life cycle stages. Stakeholders want to know more about the materials used, where and how they are sourced, reparability, and disposal strategy for the products in their lives. Considering such a wide variety of concerns and integrating them into design decision processes is challenging and often results in subjective assessments. This presentation will explain the challenge that industry faces in integrating these considerations into design processes and provide examples of how this can be successfully done to drive more sustainable decisions and business practices.

11:00 – 13:00 GENERAL INTEREST & INVITED SESSIONS

General Track 4: Decision Support and Sustainability. FAIDRE room

11:00 – 11:20; Business Model Experimentation for Sustainability
11:20 – 11:40; Design of indicators for measuring product performance in the circular economy
11:40 – 12:00; An Integrated Product Development Approach To Improving Sustainability Using Simulated Experiments: Manufacturing Case Study
12:00 – 12:20; The Characteristic Objects Method: a new intelligent decision support tool for sustainable manufacturing
12:20 – 12:40; Green Supplier selection framework based on multi-criteria decision-analysis approach
12:40 – 13:00; Improving Performance of Eco-Industrial Parks

Invited Session 2: Sustainability and resilience in agri-food supply chains. ELPIDA room

11:00 – 11:20; Agri-food supply chain for mitigation of volatilities in the role of intermediary: A case study of a mushroom trading company in Taiwan
11:20 – 11:40; Exploring dynamic natural-resource-based capabilities for sustainable agri-food chains
11:40 – 12:00; Supplier Selection Processes: A Case Study in a Chinese Dairy Company
12:00 – 12:20; Supply Chain Risk Management Identification and Mitigation: A Case Study in a Chinese Dairy Company
12:20 – 12:40; The Local Nexus Network: Exploring the Future of Localised Food Systems and Associated Energy and Water Supply
12:40- 13:00 An Approach to Lifecycle Design and Sustainable Management of Nigerian Water Infrastructure

Invited Session 3: Eco-Design through Systematic Innovation. ARIADNI room

11:00 – 11:20; Anthropometry Survey of Nigerian Occupational Bus Drivers to Facilitate Sustainable Design of Driver's Workplace
11:20 – 11:40; QFD for a SME network of the wood sector to improve competitiveness and sustainability
11:40 – 12:00; Using TRIZ to combine advantages of different concepts in an eco-design process
12:00 – 12:20; Is TRIZ an Ecodesign method?
12:20 – 12:40; An Integrated Eco-Design Decision Making Tool
12:40 – 13:00; A bridge between CAD and LCA to optimise the Life Cycle Inventory phase