THE 18TH INTERNATIONAL CONFERENCE
ON ENGINEERING DESIGN

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and the Design Society

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IMPACTING SOCIETY THROUGH ENGINEERING DESIGN
VOLUME 2: DESIGN THEORY & RESEARCH METHODOLOGY

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Ben Hicks
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Thomas Howard
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Preface by the Programme Chair

Welcome to the ICED11 Proceedings!

A large team of individuals working together are responsible for the selection of the 416 papers being presented here at ICED11, the establishment of the themes, sessions and the creation of the podium and discussion activities. This team consists of the programme chairs, the theme chairs and their assistants, and last but by no means least the reviewers. In particular, the written comments of the reviewers have been critical to the programme team in making their final choices and grouping papers into the conference themes.

The papers have been collated into a multiple range of formats: a book of abstracts, a memory stick of full proceedings and ten volumes of proceedings, available via a print-on-demand supplier. These have been numbered against both Design Society and ISSN referencing. This will enable more extensive access, referencing and citation in the future.

For ICED11 there is no difference in prestige between the papers in podium and discussion sessions. All have passed the ICED quality threshold and papers in the discussion sessions have been selected and grouped to stimulate fundamental and exciting debate. To facilitate this we have put in place a new 5 x 5 format – 5 slides in 5 minutes. We are also introducing a number of techniques to encourage audience participation and for the first time we are trialling live minutes – so as to provide a record of the debates. Further to this, recorded interviews with all the theme chairs will be undertaken on the final day of the conference so that there is also a persistent summary of each theme following the conference. The records from the discussion sessions will be made available at the conference and also uploaded to the DS website alongside the interviews with the theme chairs.

So we hope that you enjoy the programme and participate fully in what is arguably the Premier engineering design research conference in the world. We also hope that you find time to enjoy Copenhagen, catch up with old friends and make some new ones.

Steve Culley
Programme Chair

Ben Hicks
Assistant Programme Chair

ICED11
Preface by the Conference Chair

With these, the proceedings of the eighteenth International Conference on Engineering Design, ICED11, it can safely be stated that engineering design research is firmly established as a strong research discipline. In its 30 year history this is the first time that an ICED conference has returned to the same city, “Wonderful Copenhagen”. In the Danish official ‘Year of Design’ the city is the perfect conference location, hosting the highest quality design, ranging from industrial design, through stunning architecture, to a dynamic engineering design industry, which has extensively backed the ICED11 conference.

As design researchers, design practice is our research object and industrial companies are our research laboratories. Based on our observations, discussions and participation in design activities, we gather knowledge and insights and crystallise these into both academic models and practical methods. Our customers are students, in training as the product developers and innovators of the future, and industrialists, engaging with us to get insight into tools and methods, which fit to their practices and empower them to meet the challenges of global competition.

The theme we have chosen for ICED11 is Impacting Society through Engineering Design. Design has a central role in bringing engineering and technology to practical use. Each of the 416 papers in these proceedings provides its own contribution to the ICED11 theme. We’re delighted to see the variety and the quality of contributions that our colleagues from the design research community have contributed to ICED11.

We have taken great care to create a conference showing leading edge research into engineering design and product development practice and to provide a lively backdrop for knowledge exchange and research discussion.

Our goals with ICED11 have been to place particular emphasis on industry participation, provocative and relevant keynote speeches, maximum time for debate and discussion, and space to go in to depth, via the SIG workshops. And all this with a Danish flavour, which we hope you find welcoming, fun and “hyggelig”?

Welcome to ICED11!

Tim McAloone  
Conference Chair

Tom Howard  
Assistant Conference Chair
Preface by the Design Society President

The International Conference on Engineering Design (ICED) is the flagship conference of the Design Society, a Society created in 2001, on the foundations laid by Workshop Design-Konstruktion (WDK), to promote the development of the understanding of all aspects of design. The ICED conferences were inaugurated in 1981 in Rome, and with one extra conference have been held every two years since then, in fifteen countries of the world. Thirteen conferences were held under the auspices of WDK, and this is the fifth organised by the Design Society. It is also the first time that ICED has returned to a city in which the conference has been held before – Copenhagen was the second host city in 1983, and this revisit is most appropriate in view of the leading role that the city and its technical university have played in design research and practice over many years.

The 2011 Conference continues the format established in 2009, with a programme made up of plenary sessions, podium presentations, discussion sessions with focused debate and workshops led by the Design Society’s Special Interest Groups. We hope that this varied programme, combined with extensive opportunities for networking, will provide an exciting opportunity for researchers and practitioners to learn about the latest developments in engineering design.

Organising an international conference takes an enormous amount of work, and I would like to express the thanks of the Society to the great team that has worked over many months to ensure the success of the Conference. Especially I would like to thank Tim McAloone, Tom Howard and colleagues at the Technical University of Denmark for their great work in the Organising Committee, and Steve Culley, Ben Hicks and the Programme Committee for bringing together such an excellent programme. Of course, their work would be in vain without the fantastic contributions of the authors, reviewers, theme chairs and session chairs, and the thanks of the Society are due to all of them.

Chris McMahon
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Table of Contents

Preface by the Program Chair i
Preface by the Conference Chair ii
Preface by the Design Society President iii

ICED11 Design Society Programme Committee v
ICED11 Organising Team v
ICED11 Theme Chairs vi
ICED11 Scientific Committee vii

VOLUME 1: DESIGN PROCESSES

Monitoring a Property Based Product Development – from Requirements to a Mature Product
Hartmut Krehmer, Harald Meerkamm, Sandro Wartzack 1-1

Item Life Cycles in Product Data Management: A Case Study on How to Implement a Design Data Validation Process
Bertrand Nicquevert, Jean-François Boujut 1-12

Process Optimization by DSM-Based Modelling of Inputs and Outputs
Maik Maurer 1-24

Morphological Analysis of a Sustainable School Design
Wim Zeiler 1-35

Enabling Set-Based Concurrent Engineering in Traditional Product Development
Dag Raudberget 1-45

Generic Model of The Early Phase of An Innovation Process Regarding Different Degrees Of Product Novelty
Robert Orawski, Jan Krollmann, Markus Mörtl und Udo Lindemann 1-57

Bayesian Project Monitoring
Peter C Matthews And Alex D M Philip 1-69

User Centered Design in The Wild
Stompff G., Henze L.A.R., Jong, F. De , Vliembenen E. Van, Stappers P.J., Smulders F.E.H.M., Buijs J.A. 1-79

Integrated Process and Product Model for The Evaluation of Product Properties
Christoph Westphal, Sandro Wartzack 1-91

Product Development Processes in Small and Middle-Sized Enterprises – Identification and Elimination of Inefficiency caused by Product Variety
Katharina G. M. Eben, Katharina Helten, Udo Lindemann 1-101

Neutral Description and Exchange of Design Computational Workflows
Gondhalekar A. C., Guenov M. D.1, Wenzel H., Nunez M.1, Balachandran L. K.1 1-113
Decision Based Variable Mechatronic Design Processes
Peter Hehenberger, Babak Farrokhzad, Florian Poltschak 1-122

Using Simulation to Support Process Integration and Automation of the Early Stages of Aerospace Design
Warren Kerley, Gareth Armstrong, Carla Pepe, Michael Moss, P John Clarkson 1-134

Study on The Introduction of Design Management in The Product Development Process of Brazilian Clothing Companies
Graziela Kauling, Mauricio Bernardes 1-147

Lean Product Development: Hype Or Sustainable New Paradigm?
Amer Catió, Michael Velhaber 1-157

Structured Concept Development with Parameter Analysis
Ehud Kroll 1-169

Creating Value through Lean Product Development – Applying Lean Principles
Jörgen Furuhjelm, Håkan Swan, Johan Tingström 1-180

What are the Characteristics of Engineering Design Processes?
Anja M Maier, Harald Störrle 1-188

Empirical Verifications of Some Radical Innovation Design Principles onto the Quality of Innovative Designs
Bernard Yannou, Marija Jankovic, Yann Leroy 1-199

Decision-Making in Disruptive Innovation Projects: A Value Approach
F. Petetin, G. Bertolucci, J. C. Bocquet 1-211

A Comparison of Evolutionary and Revolutionary Approaches in Mechatronic Design
Ralf Stetter, Stefan Möhringer, Udo Pulm 1-221

Consideration of Goal Interrelations in Lifecycle-Oriented Product Planning
Clemens Hepperle, Armin Förj, Markus Mörtl And Udo Lindemann 1-233

Rules for Implementating Dynamic Changes in DSM-Based Plans
Arie Karniel, Yoram Reich 1-243

Analysis Of Created Representations Of The Design Object During The Problem Solving Process
Albert Albers And Aaron Wiedner 1-256

Influence of Design Evaluations on Decision-Making and Feedback During Concept Development
Vinicius Kaster Marini, Saema Ahmed-Kristensen And John Restrepo 1-266

A Mechatronic Case Study Highlighting the Need for Re-Thinking The Design Approach
Jonas Markeberg Terry-Smith, Niels Henrik Mortensen 1-276

Design Support Tools for Product-Service Systems
Yong Se Kim, Sang Won Lee, Jee-Hyong Lee, Dae Man Han And Hye Kyung Lee 1-288

Design Process Automation – A Structured Product Description by Properties and Development of Optimization Algorithms
Sebastian Gramlich, Herbert Birkhofer And Andrea Bohn 1-299

Solving Global Problems using Collaborative Design Processes
Torben Lenau, Christina Okai Mejborn 1-310
Lean Approach to Integrate Collaborative Product Development Processes And Digital Engineering Systems
Tommaso Vosgien, Marija Jankovic, Benoit Eynard, Thomas Nguyen Van, Jean-Claude Bocquet
1-321

An Empirical Evaluation of a Framework for Design for Variety and Novelty
Srinivasan V, Amarendra Chakrabarti
1-334

Indicating the Criticality of Changes During the Product Life Cycle
Florian G. H. Behnke, Udo Lindemann
1-344

Characterizing the Dynamics of Design Change
Afeef Siddiqi, Olivier L. De Weck, Bob Robinson, Rene Keller
1-355

The Influence of A Company’s Strategy on Creativity and Project Results in An NPD – Case Study
Nikola Vukšinović, Nuša Fain, Jože Duhovnik
1-366

When Sensemaking Meets Resource Allocation: An Exploratory Study of Ambiguous Ideas in Project Portfolio Management
Ernesto Gutiérrez
1-373

The Continous “Fuzzy Front End” as a Part of The Innovation Process
Milan Stevanović, Dorian Marjanović
1-383

Comparisons of Design Methodologies and Process Models across Disciplines: A Literature Review
Kilian Gericke, Luciënne Blessing
1-393

A Framework for Developing Viable Design Methodologies for Industry
Timo Lehtonen, Tero Juuti, Hannu Oja, Seppo Suistoranta, Antti Pulkkinen, Asko Riitahuhta
1-405

Development of A Framework for Improving Engineering Processes
Carla Pepe, Daniel Whitney, Elsa Henriques, Rob Farndon, Michael Moss
1-417

Coping With Deviation And Decision-Making
Joakim Eriksson, Anette Brannemo
1-429

Ensuring the Integration of Performance and Quality Standards in Design Process Management: Codesteer Methodology
Aurélien Poulet, Bertrand Rose, Emmanuel Caillaud
1-441

Engaging Actors in Co-Designing Heterogeneous Innovations
Ulrik Jørgensen, Hanne Lindegaard And Tanja Rosenqvist
1-453

Capturing Interactions in Design Preferences: A Colorful Study
Hannah Turner, Seth Orsborn
1-465

Re-Conceptualising Value in The Engineering Design Process: The Value Cycle Map
Ghadir I. Siyam, David C. Wynn, P. John Clarkson
1-475

Facing the Open Innovation Dilemma – Structuring Input at the Company’s Border
Andreas Kain, Rafael Kirschner, Alexander Lang, Udo Lindemann
1-487

Integrated System and Context Modeling of Iterations and Changes in Development Processes
Stefan Langer, Arne Hemberg, Klaus Körber, Udo Lindemann
1-499

Embodiment Design through the Integration of OTSM-TRIZ Situation Analysis with Topological Hybridization of Partial Solutions
Alessandro Cardillo, Gaetano Cascini, Francesco Saverio Frillici, Federico Rotini
1-509
A Framework for Integrated Process Modeling and Planning of Mechatronic Products
David Hellenbrand And Udo Lindemann 1-521

KPI Measurement In Engineering Design – A Case Study
Bruno Gries, John Restrepo 1-531

Information Models Used to Manage Engineering Change: A Review of The Literature 2005-2010
Naveed Ahmad, David C. Wynn, P. John Clarkson 1-538

VOLUME 2: DESIGN THEORY AND RESEARCH METHODOLOGY

On the Link Between Features and Functions
D. Gabelloni, R. Apreda, G. Fantoni 2-1

Understanding the Worlds of Design and Engineering – an Appraisal of Models
Martin Gudem, Casper Boks 2-13

Courses of Product Development Identification – Effects and Visions
Milosav Ognjanovi 2-23

Integral Design: To Combine Architecture and Engineering for a Sustainable Built Environment
Wim Zeller 2-31

How to Validate Research in Engineering Design?
Alex Barth, Emmanuel Caillaud, Bertrand Rose 2-41

Towards a Scientific Model of Function-Behavior Transformation
Yong Chen, Zhinan Zhang, Zehin Liu, Youbai Xie 2-51

Design of Functions by Function Blending
Yu Park, Shota Ohashi, Eiko Yamamoto, Toshiharu Taura 2-61

A Method for Selecting Base Functions for Function Blending in Order to Design Functions
Syo Sakaguchi, Akira Tsumaya, Eiko Yamamoto, Toshiharu Taura 2-73

A Systematic Approach of Design Theories Using Generativeness and Robustness
Armand Hatchuel, Pascal Le Masson, Yoram Reich, Benoit Weil 2-87

Accepting Ambiguity of Engineering Functional Descriptions
Pieter E. Vermaas 2-98

Theoretical Framework for Comprehensive Abstract Prototyping Methodology
Imre Horváth 2-108

Design Inspired Innovation for Rural India
Sten Ekman, Annalill Ekman, Uday Salunkhe, Anuja Agarwal 2-120

The Semantic Debate in Design Theories Applied to Product Identity Creation
Grégoire Bonnemaire, Andre Liem 2-130

Modeling Paradoxes in Novice and Expert Design
Kees Dorst, Claus Thorp Hansen 2-142

Designer Behaviour and Activity: An Industrial Observation Method
Philip Cash, Ben Hicks, Steve Culley, Filippo Salustri 2-151
Design Research Reflections – 30 Years On  
*Crispin Hales, Ken Wallace*  
2-163

Development of an Evaluation Framework for Implementation of Parametric 
Associative Methods in an Industrial Context  
*Vahid Salehi, Chris McMahon*  
2-173

Measuring History: Does Historical Car Performance Follow  
the TRIZ Performance S Curve?  
*Chris Dowlen*  
2-183

Comparing Designing Across Different Domains: an Exploratory Case Study  
*Jeff Wt Kan, John S Gero*  
2-194

Product Failure: A Life Cycle Approach  
*Luca Del Frate*  
2-204

Designing Patent Portfolio for Disruptive Innovation  
– A New Methodology Based on C-K Theory  
*Yacine Felk, Pascal Le Masson, Benoit Weil, Patrick Cogeza, Armand Hatchuel*  
2-214

Virtualisation of Product Development/ Design  
– Seen from Design Theory and Methodology  
*Weber, C., Husung, S.*  
2-226

Investigating Elementary Design Methods  
– Using and Extending the Genome-Approach  
*Sebastian Zier, Hermann Kloberdanz, Herbert Birkhofer, Andrea Bohn*  
2-236

Environment Based Design (EBD) Vs. X Development:  
A Dialog Between Theory and Retrospection  
*Yong Zeng, Jean Vareille*  
2-246

Dimensions of Objectives in Interdisciplinary Product Development Projects  
*Albert Albers, Quentin Lohmeyer, Bjorn Ebel*  
2-256

The Impact of Examples on Creative Design: Explaining Fixation and Stimulation Effects  
*Marine Agogué, Akin Kazakci, Benoit Weil, Mathieu Cassotti*  
2-266

A Method for Design Reasoning Using Logic: from Semantic Tableaux to Design Tableaux  
*Hendrks, Lex; Kazakci, Akin Osman*  
2-275

Description, Prescription and “Bad” Design  
*Paul Winkelmen*  
2-287

LINkographer: An Analysis Tool to Study Design Protocols Based on FBS Coding Scheme  
*Morteza Pourmohamadi, John S Gero*  
2-294

Do Functions Exist?  
*G.Fantoni, R.Apreda, D.Gabelloni, A.Bonaccorsi*  
2-304

E3 Value Concept for a New Design Paradigm  
*Yong Se kim, Chang Kyu Cho, Young Dae Ko, Haeseong Jee*  
2-314

CK, an Engineering Design Theory? - Contributions, Limits and Proposals  
*Denis Choulier, Eric Coateana, Joelle Forest*  
2-323

A Theory of Decomposition in System Architecting  
*Hitoshi Komoto, Tetsuo Tomiyama*  
2-334
A Framework for Comparing Design Modelling Approaches Across Disciplines
Boris Eisenbart, Kilian Gercke, Luciënne Blessing

A Note on the Debate on Scientific Process Vs. Design Process
Damien Motte, Robert Bjärnemo

Conducting Preliminary Design Around an Interactive Tabletop
Thierry Gidel, Atman Kendira, Alistair Jones, Dominique Lenne, Jean-Paul Barthes, Claude Moulin

Toward an Adaption-Innovation Strategy for Engineering Design
Philip Samuel, Kathryn Jablokow

**VOLUME 3: DESIGN ORGANISATION AND MANAGEMENT**

How Design Researchers can lead Higher Education to a Greater Impact on Society
Howard T.J., McMahon C.A., Giess M.D. 3-1

Addressing the Risks of Global Product Development
Hansen, Z.N.L. & Ahmed-Kristensen, S. 3-11

Design Driven Portfolio Management
Søren Ingomar Petersen, Martin Steinert, Sara Beckman 3-21

Business Plans Informed by Design
Søren Ingomar Petersen, John Heebøll 3-31

Influence of the Time Perspective on New Product Development Success Indicators
Afroz Moattari Kazerouni, Sofiane Achiche, Onur Hisarcikil, Vincent Thomson 3-40

Considerations on Design Management of Furniture Manufacturing Companies in Southern Brazil
Ana Galafassi, Maurício Bernardes 3-52

Technology Development Practices in Industry
Ulf Högman, Hans Johannesson 3-62

Challenges in Networked Innovation
Christiane Maurer, Rianne Valkenburg 3-74

Experiences with Idea-Promoting Initiatives – Why they don’t always Work
Liv Gish 3-83

Improving the Management of Design Project Risks using the Concept of Vulnerability: A Systems Approach
Vidal La., Marle F., Bocquet Jc. 3-93

A Frequency Analysis Approach to Ensure the Robustness of Interactions-Based Clustering of Project Risks
Marle F., Vidal La. 3-104

Effective Scheduling of User Input During the Design Process
Young Mi Choi, Ph.D. 3-116

Engineering Environment for Product Innovation
Michael Bitzer, Michael Vielhaber 3-123
Requirements for Product Development Self-Assessment Tools
Christoph Knoblinger1, Josef Oehmen, Eric Rebentisch, Warren Seering Katharina Helten

Expanding The Social Dimension: Towards A Knowledge Base for Product-Service Innovation
Åsa Ericson, Andreas C. Larsson, Tobias C. Larsson

Designing a Process for a Monopoly to transform to a Free Market Competitor – The Swedish Pharmacy System
Annalill Ekman, Stefan Carlsson, Sten Ekman

Managing Resource Scarcity in Small Enterprises' Design Processes
Lars Löfqvist

Collaborative Glitches in Design Chain: Case Study of an Unsuccessful Product Development with a Supplier
Hélène Personnier, Marie-Anne Le Dain, Richard Calvi

Recommendations for Risk Identification Method Selection according to Product Design and Project Management Maturity, Product Innovation Degree and Project Team
Viviane Vasconcellos Ferreira Grubisic, Thierry Gidel, André Ogliari

Identification and Design of Pilot Projects to Implement Lean Development
Katharina Helten, Katharina G.M. Eben, Udo Lindemann

Exploring Collaboration in a Networked Innovation Project in Industry
Katinka Bergema, Maaik Kleinsmann, Cees De Bont, Rianne Valkenburg

Business Model Design Methodology for Innovative Product-Service Systems: A Strategic and Structured Approach
Ji Hwan Lee, Dong Ik Shin, Yoo S. Hong, Yong Se Kim

Prototyping in Organizational Process Engineering
Matteo Vignoli, Diego Maria Macrì, Fabiola Bertolotti

On the Stability of Coordination Patterns in Multidisciplinary Design Projects
João Castro, Martin Steinert, Warren Seering

Management of Product Development Projects through Integrated Modeling of Product and Process Information
Kazuya Oizumi, Kei Kitajima, Naoto Yoshie, Tsuyoshi Koga, Kazuhiro Aoyama

Packaging Design in Organic Food Supply Chains – A Case Study in Sweden
Annika Olsson, Helena Lindh, Gwenola Bertoluci

A Holistic Procedure for Process Integration in Design Cooperation
Christiane Beyer, Karl-Heinrich Grote, Oliver Tegel, Christian Kubisch

Exploit and Explore: Two Ways of Categorizing Innovation Projects
Åsa Ericson, Åsa Kastensson

Steering the Value Creation in an Airplane Design Project from the Business Strategies to the Architectural Concepts
Ndrianarilala Rianantsosa, Bernard Yannou, Romaric Redon

A Comparison of the Integration of Risk Management Principles in Product Development Approaches
Denis Bassler, Josef Oehmen, Warren Seering, Mohamed Ben-Daya

ICED11
Supporting Cycle Management by Structural Analysis of the Organisational Domain in Multi-Project Environment
Fatos Elezi, Alvaro Pechuan, Alexander Mirson, Sebastian Kortler, Wieland Biedermann, Udo Lindemann 3-317

The Central Role of Exploration in Designing Business Concepts and Strategy
Senni Kirjavainen, Tua A. Björklund 3-325

Integration of Suppliers into the Product Development Process using the Example of the Commercial Vehicle Industry
Nicole Katharina Stephan, Christian Schindler 3-335

Overcoming the Keep the Market Out Premise (KMOP) in Product Development
A. Lang, R. Kirschner, A. Kain, U. Lindemann 3-346

Stakeholders’ Analysis Tools to Support the Open Innovation Process Management – Case Study
Istefani Carisio De Paula, Samanta Yang, André Korzenowski, Marcelo Nogueira Cortimiglia 3-354

Inside a PSS Design Process: Insights through Protocol Analysis
Tomohiko Sakao, Svante Paulsson, Hajime Mizuyama 3-365

Knowledge Management Challenges In New Business Development - Transition Of The Energy System
Ole Kjeldal Jensen, Saeema Ahmed-Kristensen, Nevena Jensen 3-377

Rethinking Value: A Value-Centric Model of Product, Service and Business Development
Merili Randmaa, Krestine Mougaard, Thomas Howard, Tim C. McAloone 3-387

VOLUME 4: PRODUCT AND SYSTEM DESIGN

Product Platform Automation for Optimal Configuration of Industrial Robot Families
Mehdi Tarkian, Johan Ölvander, Xiaolong Feng, Marcus Pettersson 4-1

On the applicability of structural criteria in Complexity Management
Wieland Biedermann, Udo Lindemann 4-11

Eco Tracing - A Systems Engineering Method for Efficient Tracelink Modelling
Rainer Stark, Asmus Figge 4-21

Equilibrium Design Problems in Complex Systems Realization
Jitesh H. Panchal 4-33

Balancing Internal and External Product Variety in Product Development
Iris Graessler 4-45

Integrated Product and Production Model – Issues on Completeness, Consistency and Compatibility
Stellan Gedell, Anders Claesson, Hans Johannesson 4-55

A Framework for Designing Product-Service Systems
Gokula Vijaykumar Annamalai Vasantha, Romana Hussain, Rajkumar Roy, Ashutosh Tiwari, Stephen Evans 4-67

xx ICED11
Orthogonal Views on Product/Service-System Design in an Entire Industry Branch
Tim C. Mcaloone, Krestine Mougaard, Line M. Neugebauer, Teit A. Nielsen, Niki Bey 4-77

Representation and Analysis of Business Ecosystems Co-Specializing Products and Services
Changmuk Kang, Yoo S. Hong, Kwang Jae Kim, Kwang Tae Park 4-88

Interdisciplinary System Model for Agent-Supported Mechatronic Design
Ralf Stetter, Holger Seemüller, Mohammad Chami, Holger Voos 4-100

Strategic Planning for Modular Product Families
Henry Jonas, Dieter Krause 4-112

Modularity Within a Matrix of Function and Functionality (MFF)
Žiga Zadnik, Vanja Čok, Mirko Karakaš, Milan Klijajin, Jože Duhojnik 4-122

Proactive Modeling of Market, Product and Production Architectures
Niels Henrik Mortensen, Christian L. Hansen, Lars Hvam, Mogens Myrup Andreasen 4-133

Designing Mechatronic Systems: A Model-Integration Approach
Ahsan Qamar, Jan Wikander, Carl During 4-145

An Approach for More Efficient Variant Design Processes
Sebastian Schubert, Arun Nagarajah, Jörg Feldhusen 4-157

The Process of Optimizing Mechanical Sound Quality in Product Design
Nielsen, Thomas Holst; Eriksen, Kaare Riise 4-167

Development of Modular Products under Consideration of Lightweight Design
Thomas Gumpinger, Dieter Krause 4-175

The Investigation and Computer Modelling of Humans with Disabilities
A. J. Medland, S.D. Gooch 4-185

Evaluation of an Automated Design and Optimization Framework for Modular Robots using a Physical Prototype
Vaheed Nezhadali, Omer Khaleeq Kayani, Hannan Razzaq, Mehdi Tarkian 4-195

Designing Consistent Structural Analysis Scenarios
Wieland Biedermann, Udo Lindemann 4-205

Design of an Upper Limb Independence-Supporting Device using a Pneumatic Cylinder
Norihiko Saga, Koichi Kiriha, Naoki Sugahara 4-215

Actuation Principle Selection – An Example of Trade-off Assessment by CPM-Approach
Torsten Erbe, Kristin Paetzold, Christian Weber 4-222

Automated User Behavior Monitoring System for Dynamic Work Environments
Yeoun Choi, Minsun Jang, Yong Se Kim, Seongil Lee 4-230

On the Design of Devices for People with Tetraplegia

Brownfield Process for Developing of Product Families
Timo Lehtonen, Jarkko Pakkanen, Jukka Järvenpää, Minna Lanz, Reijo Tuokko 4-248

Approach for the Creation of Mechatronic System Models
Martin Follmer, Peter Hohenberger, Stefan Punz, Roland Rosen, Klaus Zeman 4-258

Modeling and Design of Contacts in Electrical Connectors
Albert Albers, Paul Martin, Benoit Lorentz 4-268

Empirical Consideration of Predicting Chain Failure Modes in Product Structures During Design Review Process
Yuichi Otsuka, Shotakiguchi, Hirokazu Shimizu, Yoshiharu Mutoh 4-278

ICED11  xxii
Indicating the Criticality of Changes During the Product Life Cycle
Florian G. H. Behncke, Udo Lindemann 4-288

A Methodical Approach for Developing Modular Product Families
Dieter Krause, Sandra Eilmus 4-299

Product Model of the Autogenetic Design Theory
Konstantin Kittel, Peter Hegenberger, Sandor Vajna, Klaus Zeman 4-309

Product Development Support For Complex Mechatronic System Engineering–
Case Fusion Reactor Maintenance
Simo-Pekka Leino, Harri Mäkinen, Olli Uututu, Jorma Järvenpää 4-319

Analyzing the Dynamic Behavior of Mechatronic Systems within the Conceptual Design
Frank Bauer, Harald Anacker, Tobias Gaukstern, Jürgen Gausemeier, Viktor Just 4-329

Linear Flow-Split Linear Guides: Inflating Chambers to Generate Breaking Force
Nils Lommatzsch, Sebastian Gramlich, Herbert Birkhofer, Andrea Bohn 4-337

A Knowledge-Based Master Modeling Approach to System Analysis and Design
Marcus Sandberg, Ilya Tyapin, Michael Kokkolaras, Ola Isaksson 4-347

Social Systems Engineering – An Approach for Efficient Systems Development
Thomas Naumann, Ingo Tuttass, Oliver Kallenborn, Simon Frederick Königs 4-357

Improving Data Quality in DSM Modelling:
A Structural Comparison Approach
Steffen F.-Schmitz, David C. Wynn, Wieland Biedermann, P. John Clarkson, Udo Lindemann 4-369

Enhancing Intermodal Freight Transport by Means of an Innovative Loading Unit
Dipl.-Ing. Max Klingender, Dipl.-Ing. Sebastian Jursch 4-381

Representing Product-Service Systems with Product and Service Elements
Yong Se Kim, Sang Won Lee And Dong Chan Koh 4-390

A Classification Framework for Product Modularization Methods
Charalampos Daniilidis, Vincent Enßlin, Katharina Eben, Udo Lindemann 4-400

A Meta Model of the Innovation Process to Support the Decision Making Process
using Structural Complexity Management
Sebastian Kortler, Udo Lindemann 4-410

Pareto Bi-Criterion Optimization for System Sizing : A Deterministic
and Constraint Based Approach
Pierre-Alain Yvars 4-420

Sick Systems: Towards a Generic Conceptual Representation of Healthcare Systems
Alexander Komashie, Thomas Jun, Simon Dodds, Hugh Rayner, Simon Thane,
Alastair Mitchell-Baker, John Clarkson 4-430

Property Rights Theory as a Key Aspect in Product Service Engineering
Anna Katharina Dill, Herbert Birkhofer, Andrea Bohn 4-441

Product with Service, Technology with Business Model: Expanding Engineering Design
Tomohiko Sakao, Tim Mcaloone 4-449

Analysing Modifications in the Synthesis of Multiple State Mechanical
Devices using Configuration Space and Topology Graphs
Somasekharra Rao Todeti, Chakrabarti Amaresh 4-461
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecodesign in Industrial Design Consultancies – Comparing Australia,</td>
<td>Johannes Behirsch, Dr. Mariano Ramirez, Dr. Damien Giurco</td>
<td>5-1</td>
</tr>
<tr>
<td>China, Germany and the USA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Additive Manufacturing Technologies: New Applications of</td>
<td>Stefan Junk, Marco Tränkle</td>
<td>5-12</td>
</tr>
<tr>
<td>3D-Printing for Rapid Prototyping and Rapid Tooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflections on Design for Sustainability- A View from a Distinct</td>
<td>K Ioannou-Kazamia, J Gwilliam</td>
<td>5-19</td>
</tr>
<tr>
<td>Point and the Role of Interior Designer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designing with a Social Conscience: An Emerging Area in Industrial</td>
<td>Mariano Ramirez Jr</td>
<td>5-39</td>
</tr>
<tr>
<td>Design Education and Practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Optimization of Environmental Impact by a Constraint</td>
<td>Vincent Larroudé, Pierre-Alain Yvars, Dominique Millet</td>
<td>5-49</td>
</tr>
<tr>
<td>Satisfaction Approach – Application to Ship-Ecodesign</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designing for Resilience: using a Delphi Study to Identify Resilience</td>
<td>Mary Lou Masko, Claudia M. Eckert, Nicholas H.M. Caldwell, P. John</td>
<td>5-60</td>
</tr>
<tr>
<td>Issues for Hospital Designs in a Changing Climate</td>
<td>Clarkson</td>
<td></td>
</tr>
<tr>
<td>Modelling Time-Varying Value of an End-Of-Life Product for Design</td>
<td>Minjung Kwak, Harrison M. Kim</td>
<td>5-70</td>
</tr>
<tr>
<td>for Recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Impact of Safety Standards and Policies on Optimal Automobile</td>
<td>Steven Hoffenson, Panos Papalambros</td>
<td>5-81</td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design for Diagnosis</td>
<td>Ralf Stetter, Ulrike Phleps</td>
<td>5-91</td>
</tr>
<tr>
<td>An Engineering-Based Environmental Management System Design</td>
<td>Colin Burvill, John Weir, Martin Leary</td>
<td>5-103</td>
</tr>
<tr>
<td>Getting to Sustain (-Able Systems) via using Survivable and</td>
<td>Richard Tabor Greene</td>
<td>5-113</td>
</tr>
<tr>
<td>Impose-Able Ones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toward Proactive Eco-Design Based on Engineer and Eco-Designer’s</td>
<td>Maud Rio, Tatiana Reyes, Lionel Roucoules</td>
<td>5-124</td>
</tr>
<tr>
<td>Software Interface Modeling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designing Sustainable Society Scenarios using Forecasting</td>
<td>Yuji Mizuno, Yusuke Kishita, Haruna Wada, Maki Hiroesaki, Shinichi</td>
<td>5-135</td>
</tr>
<tr>
<td>Fukushige, Yasushi Umeda</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success Criteria for Implementing Sustainability Information in</td>
<td>Silje Helene Aschehoug, Casper Boks</td>
<td>5-145</td>
</tr>
<tr>
<td>Product Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universal Design and Visual Impairment: Tactile Products for</td>
<td>Jaume Gual, Marina Puyuelo, Joaquim Lloveras</td>
<td>5-155</td>
</tr>
<tr>
<td>Heritage Access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing an Ecology of Mind in Design</td>
<td>Emma L Dewberry</td>
<td>5-165</td>
</tr>
</tbody>
</table>

ICED11
Management of Energy Related Knowledge in Integrated Product Development – Concept and Selected Instruments
Uwe Götze, Erhard Leidich, Annett Bierer, Susann Köhler 5-176

Sustainability Innovation in Early Phases
Massimo Panarotto, Peter Törnqvist 5-187

Manufacturing Cost Estimation During Early Phases of Machine Design
Michele Germani, Marco Mandolini, Paolo Cicconi 5-198

Design for Dependability – Identifying Potential Weaknesses in Product Concepts
Tim Sadek, Michael Wendland 5-210

Impact of Modularised Production on Product Design in Automotive Industry
Waldemar Walla, Thomas Baer, Jivka Ovtcharova 5-220

Design for Reliability: An Event- and Function-Based Framework for Failure Behavior Analysis in the Conceptual Design of Cognitive Products
Thierry Sop Njindam, Kristin Paetzold 5-228

A New Approach to Modularity in Product Development – Utilising Assembly Sequence Knowledge
Authors: A. Robert, X.T. Yan, S. Roth, K. Deschinkel, S. Gomes 5-238

Approach to Visualize the Supply Chain Complexity Induced by Product Variety
Max Brosch, Gregor Beckmann, Dieter Krause 5-249

Integration of Remanufacturing Issues into the Design Process
Gillian Hatcher, Winifred Ijomah And James Windmill 5-259

Investigating the Requirements Needed to Make Appropriate End of Life Decisions
Kirsty Doyle, Winifred L. Ijomah, Jiju Antony 5-265

Product and Process Evaluation in the Context of Modularization for Assembly
Niklas Halfmann, Steffen Elstner, Dieter Krause 5-271

A Case Study of Design for Affordance: Affordance Features of a Simple Medical Device
Yong Se Kim, Young Chan Cho, Sun Ran Kim 5-282

Which Guideline is Most Relevant? Introduction of a Pragmatic Design for Energy Efficiency Tool
Karola Rath, Herbert Birkhofer, Andrea Bohn 5-293

The Concept of Ecological Levers – A Pragmatic Approach for the Elicitation of Ecological Requirements
Shulin Zhao, Herbert Birkhofer, Andrea Bohn 5-302

Methodology for Choosing Life Cycle Impact Assessment Sector-Specific Indicators
Bruno Chevalier, Tatiana Reyes-Carrillo, Bertrand Laratte 5-312

Selection of Physical Effects Based on Disturbances and Robustness Ratios in the Early Phases of Robust Design
Johannes Mathias, Tobias Eifler, Roland Engelhardt, Hermann Kloberdanz, Herbert Birkhofer, Andrea Bohn 5-324

Requirements of a Carbon Footprinting Tool for Designers
Rhoda Trimingham, Sofia Garcia-Noriega 5-336

Extraction and Analysis Methodology for Supporting Complex Sustainable Design
Helen Liang, David Birch 5-346
VOLUME 6: DESIGN INFORMATION AND KNOWLEDGE

Scenario-Based Design in Design Pattern Mining
Claudia Iacob 6-1

Integral Designed Database Morphology for Active Roofs
Wim Zeiler, Emile Quanjel 6-11

Dual Perspective on Information Exchange Between Design and Manufacturing
Jessica Bruch, Glenn Johansson 6-21

The Digital Divide: Investigating the Personal Information Management Practices of Engineers
Hamish Mcalpine, Ben Hicks, Can Tiryakioğlu 6-31

Predicting Emerging Product Design Trend by Mining Publicly Available Customer Review Data
Conrad Tucker, Harrison M. Kim 6-43

How Product Representation Types are Perceived at the Client’s End to Facilitate Communication and Decision Making
André Liem 6-53

Data Management Planning in Engineering Design and Manufacturing Research
Mansur Darlington, Tom Howard, Alex Ball, Steve Culley, Chris McMahan 6-65

Capturing the Conceptual Design Process with Concept-Configuration-Evaluation Triplets
Ehud Kroll, Alexander Shihmanter 6-76

Modeling and Management of Product Knowledge in an Engineer-to-Order Business Model
Fredrik Elgh 6-86

Manifestation of Uncertainty - A Classification
Melanie E. Kreye, Yee Mey Goh, Linda B. Newnes 6-96

Acquisition of Design-Relevant Knowledge within the Development of Sheet-Bulk Metal Forming
Sebastian Röhner, Thilo Breitsprecher, Sandro Wartzack 6-108

Knowledge Representation for Supplier Discovery in Distributed Design and Manufacturing
Christian Mcarthus, Farhad Ameri 6-121

Case Studies to Explore Indexing Issues in Product Design Traceability Framework
Neven Pavković, Nenad Bojićević, Leonard Franjić, Dorian Marjanović 6-131

Learning from the Lifecycle: The Capabilities and Limitations of Current Product Lifecycle Practice and Systems
James A. Gopsill, Hamish C. Mcalpine, Ben J. Hicks 6-141

Visualising Ergonomics Data for Design
Hua Dong, Eujin Pei, Hongyan Chen, Robert Macredie 6-153

Knowledge Configuration Management for Product Design and Numerical Simulation
J. Badin, D. Monticolo, D. Chamoret, S. Gomes 6-161

Reference Model for Traceability Records Implementation in Engineering Design Environment
Mario Štorga, Dorian Marjanović, Tomaž Savšek 6-173

ICED11 xxv
Software Supported Knowledge Transfer for Product Development
Sönke Krebber, Hermann Kloberdanz, Herbert Birkhofer, Andrea Bohn 6-342

Search for Similar Technical Solutions by Object Abstraction using an Ontology
Andreas Kohn, Udo Lindemann 6-350

A Methodology for Discovering Structure in Design Databases
Katherine Fu, Jonathan Cagan, Kenneth Kotovsky 6-360

Comparative Study of Theoretical and Real uses of Eco-Designed Laundry Detergents
Chapotot, Emilie; Abi Akle, Audrey; Minel, Stéphanie; Yannou, Bernard 6-370

Designers’ Thinking and Acting in Meetings with Clients
Sônia Da Silva Vieira, Petra Badke-Schaub, António Fernandes, Teresa Fonseca 6-382

A Structure for Representing Problem Formulation in Design
Mahmoud Dinar, Jami Shah, Pat Langley, Glen Hunt And Ellen Campana 6-392

A New Metamodel to Represent Topologic Knowledge in Artifactual Design
J. M. Jauregui-Becker, K.J.W. Gebauer, F. J. A. M. Van Houten 6-402

N-Gram Analysis in the Engineering Domain
Martin Leary, Geoff Pearson, Colin Burvill, Maciej Mazur, Aleksandar Subic 6-414

Applying Context to Organize Unstructured Information in Aerospace Industry
Yifan Xie, Steve J Culley, Frithjof Weber 6-424

Improving Design Rationale Capture During Embodiment Design
Jeroen Van Schaik, Jim Scanlan, Andy Keane, Kenji Takeda, Dirk Gorissen 6-436

Exploring the Synthesis of Information in Design Processes – Opening the Black-Box
Raja Gumienny, Tilmann Lindberg, Christoph Meinel 6-446

Representation of Cross-Domain Design Knowledge through
Ontology Based Functional Models
Dipl.-Ing. Milan Marinov, Dipl.-Wi.-Ing. Dan Gutu, B.Sc. Janet Todorova, Dr. Miklós Szotz, András Simonyi, Prof. Dr. Dr.-Ing. Dr. H.C. Jivka Ovtcharova 6-456

Adapting Aerospace Design Rationale Mapping To Civil Engineering: A Preliminary Study
Nathan Eng, Emanuele Marfisi, Marco Aurisicchio 6-468

Knowledge Sharing Approaches in Method Development
Peter Thor, Johan Wenngren, Åsa Ericson 6-480

Application of MOKA Methodology to Capture Knowledge in Design
for Poka-Yoke Assembly
Gabriela Estrada, Joaquim Lloveras 6-490

The Evolution of Information While Building Cross-Domain
Models of a Design: A Video Experiment
Naveed Ahmad, David C. Wynn, P. John Clarkson 6-500

VOLUME 7: HUMAN BEHAVIOUR IN DESIGN

Improving Communication in Design: Recommendations From The Literature
Anja M Maier, Denniz Dönmez, Clemens Hepperle, Matthias Kreimeyer, Udo Lindemann, P John Clarkson 7-1
Culture and Concept Design: A Study of International Teams
Andrew Wodehouse, Ross Maclachlan, Hilary Grierson and David Strong 7-12

Associative Thinking as a Design Strategy and its Relation to Creativity
Hernan Casakin 7-22

Social Media Enabled Design Communication Structure in a Buyer-Supplier Relationship
V. Hölttä, T. Eisto 7-32

Emotion-Driven Elicitation of Elderly People user needs Illustrated by a Walking Frame Case Study
Hjalte P. Gudmundsson, Casper L. Andersen, Sofiane Achiche, Per Boelskifte 7-44

Choosing Innovation: How Reasoning Affects Decision Errors
Ronny Mounarath, Dan Lovallo, Andy Dong 7-54

Enabling Objects for Participatory Design of Socio-Technical Systems
Ole Broberg 7-64

Challenges and Limitations of Applying an Emotion-Driven Design Approach on Elderly Users
Casper L. Andersen, Hjalte P. Gudmundsson, Sofiane Achiche, Per Boelskifte 7-74

On the Effective use of Design-By-Analogy: The Influences of Analogical Distance and Commonness of Analogous Designs on Ideation Performance
Joel Chan, Katherine Fu, Christian Schunn, Jonathan Cagan, Kristin Wood, Kenneth Kotovsky 7-85

Ingredients of the Design Process: Going Through Emotional Passage
Cliff Shin 7-97

Meaning-Based Assessment in Creative Design
Hernan Casakin, Shulamith Kreitler 7-107

How Important is Team Structure to Team Performance?
Vishal Singh, Andy Dong, John S Gero 7-117

Applied Test of Engineering Design Skill: Visual Thinking, Characterization, Test Development and Validation
Jami J. Shah, Jay Woodward, S. M. Smith 7-127

Analysing the use of four Creativity Tools in a Constrained Design Situation
Snider, C.M., Dekoninck, E.A., Yue, H., Howard, T.J. 7-140

Collaborative Trust Networks in Engineering Design Adaptation
Simon Reay Atkinson, Anja M Maier, Nicholas Caldwell, P John Clarkson 7-152

The importance of Empathy in IT Projects: A Case Study on the Development of the German Electronic Identity Card
Eva Köppen, Ingo Rauth, Maxim Schnjakin, Christoph Meinel 7-162

A Sound-Based Protocol to Study the Emotions Elicited by Product Appearance
Weihua Lu, Jean-François Petiot 7-170

A Scenario of user Experience
Juan Carlos Ortiz Nicolás, Marco Aurisicchio 7-182

The Relationship Between a Model and a Full-Size Object or Building: The Perception and Interpretation of Models
Yvonne Eriksson, Ulrika Florin 7-194
Review of Collaborative Engineering Environments: Software, Hardware, Peopleware
Jonathan Osborn, Joshua D. Summers, Gregory M. Mocko 7-204

Exploring Consumer Needs with Lewin’s Life Space Perspective
Kee-Ok Kim, Hye Sun Hwang 7-214

Proposal of “Expectology " as Design Methodology
Tamotsu Murakami, Satoshi Nakagawa, Hideyoshi Yanagisawa 7-224

An Approach to Analyzing user Impressions and Meanings of Product Materials in Design
Georgi V. Georgiev, Yukari Nagai 7-234

A Method to Study Affective Dynamics and Performance in Engineering Design Teams
Malte F. Jung, Larry J. Leifer 7-244

Cultural "Value Creation" in the Design of Cellular Phones
André Liem, Bijan Aryana 7-254

Idea Screening in Engineering Design using Employee-Driven Wisdom of the Crowds
Balder Onarheim, Bo T. Christensen 7-265

Facilitating Creative Problem Solving Workshops: Empirical Observations at a Swedish Automotive Company
Katarina Lund, Johan Tingström 7-275

Creative Teamwork in Quick Projects Development QPD, 24 Hours of Innovation
Luz-Maria Jiménez, Denis Choulier, Jeremy Legardeur, Mickaël Gardoni 7-285

Emotional Orientation and Context Analysis for Design Creativity Exercise Test
Jongho Shin and Yang Se Kim 7-297

Understanding Fixation: A Study on the Role of Expertise
Vimal Viswanathan and Julie Linsey 7-309

Adoption of a Systematic Design Process: A Study of Cognitive and Social Influences on Design
Thea Morgan, Theo Tryfonas 7-320

Taxonomy of Cognitive Functions
Torsten Metzler, Kristina Shea 7-330

Supporting Annotation-Based Argumentation Linking Discursive and Graphical Aspects of Design for Asynchronous Communication
Jean-François Boujut 7-342

Initial Conditions: The Structure and Composition of Effective Design Teams
Greg Kress, Mark Schar 7-353

Creativity Techniques for a Computer Aided Inventing System
Davide Russo, Tiziano Montecchi 7-362

Characterizing Reflective Practice in Design – What about those Ideas you get in the Shower?
Rebecca M. Currano, Martin Steinert, Larry J. Leifer 7-374

Monitoring Design Thinking Through In-Situ Interventions
Micah Lande, Neeraj Sonalkar, Malte Jung, Christopher Han, Banny Banerjee, Larry Leifer 7-384

ICED11 xxix
Design-by-Analogy using the Wordtree Method and an Automated Wordtree Generating Tool
E. V. Oriakhi, J. S. Linsey, X. Peng 7-394

Around You: How Designers Get Inspired
Milene Gonçalves, Carlos Cardoso, Petra Badke-Schaub 7-404

Information Behavior in Multidisciplinary Design Teams
Ensici, Ayhan, Badke-Schaub, Petra 7-414

Designing: Insights from Weaving Theories of Cognition and Design Theories
Eswaran Subrahmanian, Yoram Reich, Frida Smulders, Sebastiaan Meijer 7-424

Understanding the Front End of Design
T. Harrison, M. Aurisicchio 7-437

Context-Specific Experience Sampling for Experience Design Research
Yong Se Kim, Yeon Koo Hong, Jin Hui Kim, Young Mi Kim 7-448

Product Profile to Reduce Consumer Dissatisfaction in Terms of Soft Usability Problem and Demographical Factors: an Exploratory Study
Chajoong Kim, Henri Christiaans 7-458

The Psychological Experience of user Observation
Elizabeth Gerber 7-468

Problems and Potentials in the Creation of New Objects
Joakim Juhl, Martin Gylling 7-480

A Protocol for Connective Complexity Tracking in the Engineering Design Process
James Mathieson, Michael Miller, Joshua Summer 7-492

A New Framework of Studying the Cognitive Model of Creative Design
Ganyun Sun, Shengji Yao 7-501

VOLUME 8: DESIGN EDUCATION

Identifying and Quantifying Industry Perceptions of Engineering Drawing Skills in Novice Malaysian Engineers
Zulkeflee Abdullah, Colin Reginald Burvill, Bruce William Field 8-1

Measuring Malaysian Undergraduate Skills in Reading and Interpreting Engineering Drawing
Zulkeflee Abdullah, Bruce William Field, Colin Reginald Burvill 8-13

Assessing Quality of Ideas in Conceptual Mechanical Design
William Lewis, Bruce Field, John Weir 8-23

Fluency and Flexibility of Concepts Arising from Personalised Ideation Techniques
Bruce Field 8-35

Exploiting Hand Sketching in Educating ‘Mechanically Oriented’ Engineering Students
Farrugia P.J., Borg J.C., Camilleri K.P. 8-45

Implementing Design Critique for Teaching Sustainable Concept Generation
William Z Bernstein, Devarajan Ramnajan, Monica F Cox, Fu Zhao, John W Sutherland, Karthik Ramani 8-55

xxx  ICED11
Integrated Systems Design Education
Alastair Conway, Graham Wren, Bill Ion
8-66

A Process of Conceptual Engineering Design for New Patentable Products
Joaquim Lloveras
8-78

Strengthening Asian Advanced Design and Manufacture Education Through a Framework Approach
Fayyaz Rehman, Xiu-Tian Yan, Youhua Li, Xincai Tan, Eric Miller, Nick Woodfine
8-88

Planning Industrial PhD Projects in Practice: Speaking Both 'academia' and 'practitionerese'
Ingrid Kihlander, Susanne Nilsson, Katarina Lund, Sofia Ritzén, Margareta Norell Bergendahl
8-100

Characterization of Leadership within Undergraduate Engineering Design Teams Through Case Study Analysis
Gary Palmer, Joshua D. Summers
8-110

Do Basic Schemata Facilitate Embodiment Design?
Roman Žavbi, Nuša Fain, Janez Rihtarši
8-120

Machine Part Exhibition and Functional Mock-Ups to Enrich Design Education
Gregor Beckmann, Dieter Krause
8-130

Teaching Design for Environment in Product Design Classes
Michael C. Baeriswyl, Steven D. Eppinger
8-140

Integration of DFMA Throughout an Academic Product Design and Development Process Supported by a PLM Strategy
Gilberto Osorio-Gomez, Santiago Ruiz-Arenas
8-151

Learning Levels in Technical Drawing Education: Proposal for an Assessment Grid Based on the European Qualifications Framework (EQF)
Riccardo Metraglia, Gabriele Baronio, Valerio Villa
8-161

A Coherent and Discriminating Skills Standard for Innovative Design
Denis Choulier, Pierre Alain Weite
8-173

A Proposal for an Assessment Form for Engineering Design Theses
Robert Watty, Matthias Kreimeyer
8-184

Adapting Industrial Design Education to Future Challenges of Higher Education
André Liem, Johannes B. Sigurjonsson
8-194

New Job Roles in Global Engineering – from Education to Industrial Deployment
Kai Lindow, Patrick Müller, Rainer Stark
8-205

An Ethical Stance: Engineering Curricula Designed for Social Responsibility
Ian De Vere, Ajay Kapoor, Gavin Melles
8-216

Developing A Drawing Culture: New Directions in Engineering Education
Ian De Vere, Gavin Melles, Ajay Kapoor
8-226

Shaping The Individual Designer: Participatory Design in Emergency Context.
Briëde Westermeyer, Juan Carlos; Cartes, Jorge; Bustamante, Alejandro; Perez, Marcela
8-236

A ‘Theatric’ Approach to the Teaching of Design
Jason Matthews, Tony Medland
8-245

The DesignExchange: Supporting the Design Community of Practice
Celeste Roschuni, Alice M. Agogino, Sara L. Beckman
8-255

ICED11 xxxi
Improving Engineering Education in India Using Information and Communication Technology: A New Framework
Prerak Mehta
8-265

Foundations for a New Type of Design-Engineers – Experiences from DTU
Ulrik Jørgensen, Søsser Brodersen, Hanne Lindegaard, Per Boelskiffe
8-275

Sharing Experience in Design Education Based on Research and Industrial Practice
Stanislav Hosnedl, Zbynek Srp
8-287

VOLUME 9: DESIGN METHODS AND TOOLS PART 1

Decision Support for Improving the Design of Hydraulic Systems by Leading Feedback into Product Development
Michael Abramovici, Andreas Lindner, Florian Walde, Madjid Fathi, Susanne Dienst
9-1

Clustering Customer Dreams – An Approach for a More Efficient Requirement Acquistion
Benjamin Röder, Herbert Birkhofer, Andrea Bohn
9-11

Proposal About the use of Data Base in Engineering Design
Francesco Rosa, Eduardo Rovida, Roberto Vigano
9-21

Application of Basic Design Principles for Solution Search in Biomimetics
Manuela Iulia Parvan, Andreas Schwalmberger, Udo Lindemann
9-30

Use of Constraints in the Early Stages of Design
Glen Mullineux
9-40

A Knowledge-Based Superposing Sketch Tool for Design Concept Generation Through Reflection of Verbal and Drawing Expression
Yutaka Nomaguchi, Yoko Koteru, Kikuo Fujita
9-50

Economic Impact Estimation of New Design Methods
Roland Koppe, Stefan Häusler, Frank Poppen, Stephan Große Austing, Axel Hahn
9-61

Failure Mode and Effects Analysis in Combination with the Problem-Solving A3
Eirin Lodgaard, Øystein Pellegråt, Geir Ringen, Jon Andreas Klokkehaug
9-71

Supporting Inclusive Product Design with Virtual User Models at the Early Stages of Product Development
Pierre T. Kirisci, Klaus-Dieter-Thoben, Patrick Klein, Markus Modzelewski
9-80

Using Virtual Reality in Designing the Assembly Process of a Car
Ilse Becker, Ville Toivonen, Simo-Pekka Leino
9-91

On the Types and Roles of Demonstrators for Designing Medical Devices
Benoit Herman, Julien Sapin, Kinh Tran Duy, Benoit Raucet
9-101

Computational Representations for Multi State Design Tasks and Enumeration of Mechanical Device Behaviour
Somasekhar Rao Todeti, Amarendra Chakrabarti
9-111

IFMEA – Integration Failure Mode and Effects Analysis
Stefan Punz, Martin Follmer, Peter Hehenberger, Klaus Zeman
9-122

ELISE 3d - A Database-Driven Engineering and Design Tool
Authors: M. Maier, Dr. C. Hamm
9-132
Evaluation of Data Quality in the Context of Continuous Product Validation Throughout the Development Process
Jochen Reitmeier, Kristin Paetzold

Geometric Manipulation Method for Evaluation of Aesthetic Quality in Early Design Phases
T. Stoll, A. Stockinger, S. Wartzack

A Morphological Approach to Business Model Creation using Case-Based Reasoning
Ji Hwan Lee, Yoo S. Hong

A Metric to Represent the Evolution of CAD/Analysis Models in Collaborative Design.
Nicolas Drémont, Pascal Graignic, Nadège Troussier, Robert Ian Whitfield, Alex Duffy

Significance of Requirements for the Implementation of New Technologies using Shape Memory Technology
Sven Langbein, Konstantin Lygin, Tim Sadek

Interdisciplinary Systems Modeling using the Contact and Channel-Model for SYSML
Albers, Albert, Zingel, Christian

A Novel Hybrid 2D and 3D Augmented Reality Based Method for Geometric Product Development
Pablo Prieto

A Methodology to Evaluate the Structural Robustness of Product Concepts
Maximilian P. Kissel, David Hellenbrand, Udo Lindemann

Towards Assessing the Value of Aerospace Components: A Conceptual Scenario
Marco Bertoni, Christian Johansson, Alessandro Bertoni

Seven Years of Product Development in Industry – Experiences and Requirements for Supporting Engineering Design with ‘Thinking Tools’
Sven Matthiesen

Design of Innovative Product Profiles: Anticipatory Estimation of Success Potential
Yuri Borgianni, Alessandro Cardillo, Gaetano Cascini, Federico Rotini

UMEA - A Follow-Up to Analyse Uncertainties in Technical Systems
Roland Engelhardt, Marlon Wiebel, Tobias Effer, Hermann Kloberdanz, Herbert Birkhofer, Andrea Bohn

Selection of Design Concepts using Virtual Prototyping in the Early Design Phases
Mikko Seppälä, Andrea Buda, Eric Coatanéa

Early Robustness Optimization of Automotive Modules – Regarding the Key Impact of the Human Factor
Fabian Wuttke, Florian Feustel, Martin Bohn, Steffen Csernak, Andrea Bohn

Decision Processes in Engineering Design: A Network Perspective of Stakeholder and Task Interaction
Julie R. Jupp

Immersive Product Improvement IPI – First Empirical Results of a New Method
Rafael Kirschnar, Andreas Kain, Alexander Lang, Udo Lindemann

A Methodology for Designing a Recommender System Based on Customer Preferences
Inês Jomaa, Emilie Poirson, Catherine Da Cunha, Jean-François Petiot

Evaluation of Solution Variants in Conceptual Design by Means of Adequate Sensitivity Indices
Tobias Effer, Johannes Mathias, Roland Engelhardt, Hermann Kloberdanz, Herbert Birkhofer, Andrea Bohn

ICED11 xxxiii
Modular Optimization Strategy for Layout Problems
Julien Bénabès, Emilie Poirson, Fouad Bennis, Yannick Ravaut

Maintenance Engineering: Case Study of Fitness for Service Assessments
Francesco Giacobbe, Domenico Geraci, Emanuele Biancuzzo, Mirko Albino

An Approach for the Automated Synthesis of Technical Processes
Tino Stankovi, Kristina Shea, Mario Štorga, Dorian Marjanovi

Understanding Styling Activity of Automotive Designers: A Study of Manual Interpolative Morphing Through Freehand Sketching
Shahriman Zainal Abidin, Anders Warell, Andre Liem

Advanced Applications of a Computational Design Synthesis Method
F. Bolognini, K. Shea, A.A. Seshia

Exploring Potentials for Conservational Reasoning using Topologic Rules of Function Structure Graphs
Chiradeep Sen, Joshua D. Summers, Gregory M. Mocko

A Decomposition Algorithm for Parametric Design
J. M. Jauregui-Becker, W. O. Schotborgh

Innovation Through Design for Emotion
Vincent Berdillon, Anne Guenand

Can Existing Usability Techniques Prevent Tomorrow’s Usability Problems?
Christelle Harkema, Ilse Luysk-De Visser, Kees Dorst, Aarnout Brombacher

Application to a Car Body Frame Based on Parameter Guidelines for Deriving Diverse Solutions using Emergent Design System
Koichiro Sato, Yoshiyuki Matsuoka

Hierarchical System Concept Generation
Rosenstein David, Yoram Reich

Usage Context-Based Choice Modeling for Hybrid Electric Vehicles
Lin He, Wei Chen

An Examination of the Application of Plan-Do-Check-Act Cycle in Product Development
Eirin Lodgaard, Knut Einar Aasland

Realizing a Truly 3D Product Visualization Environment – A Case for using Holographic Displays
Eliab Z. Opioyo

Design Exploration with Useless Rules and Eye Tracking
Iestyn Jowers, Miquel Prats, Alison Mckay, Steve Garner

Simulation Based Generation of an Initial Design Taking into Account Geometric Deviations and Deformations
Michael Walter, Thilo Breitsprecher, Georg Gruber, Sandro Wartzack

Collaborative Idea Generation using Design Heuristics
Seda Yilmaz, James L. Christian, Shanna R. Daly, Colleen M. Seifert, Richard Gonzalez
Understanding Managers Decision Making Process for Tools Selection in the Core Front End of Innovation
Francesco P. Appio, Sofiane Achiche, Tim Mcaloon, Alberto Di Minin

Evaluating the Risk of Change Propagation
Arman Oduncuglu, Thomson, Vince

Multilayer Network Model for Analysis and Management Of Change Propagation
Michael C. Pasqual, Olivier L. De Weck

Can Designers be Proactively Supported as from Product Specifications?
Amanda Galea, Jonathan Borg, Alexia Grech, Philip Farrugia

Design Preference Elicitation: Exploration and Learning
Yi Ren, Panos Papalambros

Designing to Maximize Value for Multiple Stakeholders: A Challenge to Med-Tech Innovation
Lauren Aquino Shluzas, Martin Steinert, Larry J. Leifer

Customer Value is Not a Number - Investigating the Value Concept in Lean Product Development
Martin Gudem, Martin Steinert, Torgeir Welo, Larry Leifer

An Agent-Based System for Supporting Design Engineers in the Embodiment Design Phase
Martin Kratzer, Michael Rauscher, Hansgeorg Binz, Peter Goehner

Combining Narrative and Numerical Simulation: A Supply Chain Case
Mette Sanne Hansen, Klaes Rohde Ladeby, Lauge Baungaard Rasmussen, Peter Jacobsen

Change in Requirements During the Design Process
Mohd Nizam Sudin, Saeema Ahmed-Kristensen

Understanding Adaptability Through Layer Dependencies
Robert Schmidt Iii, Jason Deamer, Simon Austin

Interactivity in Early-Stage Design by Real-Time Update of Stress Information for Evolving Geometries
J. Trevelyan, D.J. Scales

A Value-Centric QFD for Establishing Requirements Specification
Xinwei Zhang, Guillaume Auriol, Anne Monceaux, Claude Baron

IT Support for the Creation and Validation of Requirements Specifications – with a Case Study for Energy Efficiency
Thomas Reichel, Gudula Rünger, Daniel Steger, Haibin Xu

A Decision Support System for the Concept Development of RIM Parts
Ricardo Torcato, Ricardo Santos, Madalena Dias, Richard Roth, Elsa Olivetti, José Carlos Lopes

Abstract Prototyping in Software Engineering: A Review of Approaches
Ele Du Bois, Imre Horváth

Early Reliability Estimation in Automotive Industry
Michael Kopp, Daniel Hofmann, Bernd Bertsche, Christian Heß, Oliver Fritz

System Dynamics Modeling of New Vehicle Architecture Adoption
Carlos Gorbea, Udo Lindemann, Olivier De Weck