



Proceedings of the 21st International Conference on Engineering Design

Proceedings Volume DS87-1

VOLUME 1

**Resource-Sensitive Design |
Design Research Applications and Case Studies**

ISSN 2220-4342; ISBN 978-1-904670-89-6; EAN: 9781904670896



ICED17

21st International Conference on Engineering Design
Vancouver, Canada 21-25 August 2017

Organised by: The Department of Mechanical Engineering
at the University of British Columbia and the Design Society



THE UNIVERSITY OF BRITISH COLUMBIA



Edited by: Anja Maier, Stanko Škec
Harrison Kim, Michael Kokkolaras, Josef Oehmen
Georges Fadel, Filippo Salustri, Mike Van der Loos

Published by:
the Design Society

First published in 2017

This publication is copyright under the Berne Convention and International Copyright convention. All rights reserved. Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright, Designs and Patents Act of 1988, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, electrical, chemical, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owners. Unlicensed multiple copying of the contents of this publication is illegal. Abstracting and non-profit use of this material is permitted with a credit to the source.

Authors may self-archive their articles on their own websites or the repositories of their academic institutions, provided the source is credited and a link made to www.designsociety.org. All enquiries should be addressed to The Design Society.

©2017 The Design Society, Glasgow, Scotland, UK unless otherwise stated.

The Design Society is a charitable body, registered in Scotland, number SC 031694.

ISBN 978-1-904670-89-6, 601 pages.

PREFACE BY THE PROGRAMME CHAIRS

Dear Reader,

Welcome to the proceedings of the 21st International Conference on Engineering Design (ICED17). Each of the 413 manuscripts provides its own contribution to the vibrant community of design researchers and practitioners. The individual contributions come together to make a significant collective impact on this year's conference theme: Resource-Sensitive Design.

We are delighted to present an exciting scientific programme that acknowledges the rich tradition of the ICED conference series, manifests the collective creation of bodies of insights, connects across topics, and provides vantage points for the role and importance of designing emergent futures.

We placed particular emphasis on the young by introducing a design competition in form of a High-School Student Design Fair, by opening the conference also to the wider public that afternoon, by fostering research talent in the PhD Forum, and by providing a platform for visions and dreams of and for the Design World to come through the Young Members' Event.

Reviews have been invaluable for the ICED17 programme team in making their final acceptance decisions, grouping papers into the conference topics, and connecting to the conference theme. As a result, resource-sensitive design, design processes, design organisation and management, design research applications and case studies, product, services and systems design, design methods and tools, design for X / design to X, design information and knowledge, design theory and research methodology, human behaviour in design, and design education are all well represented in podium and discussion sessions. The attentive observer will also pick up weak signals of upcoming trends through the papers and presentation sessions. We trust that the careful selection of session chairs will amplify these signals.

The papers have been collated into a multiple range of formats: a programme and abstracts book, a memory stick of full proceedings, and nine volumes of proceedings, available for download from the Design Society website. These have been numbered against both Design Society and ISSN/ISBN referencing. The ICED conference proceedings are included in the Thomson Reuters Conference Proceedings Citation Index. This will enable more extensive access and increase citations.

We hope that you will enjoy the programme, and that you will participate actively in what is arguably the premier engineering design research conference in the world. We also hope that you will find the time to enjoy Vancouver, catch up with old friends and make some new ones.



Anja M. Maier
Programme Committee Chair



Stanko Škec
Assistant Programme Chair



Harrison Kim
Programme Chair



Michael Kokkolaras
Programme Chair



Josef Oehmen
Programme Chair

WELCOME BY THE CONFERENCE CHAIRS



Mike Van der Loos

Mike Van der Loos
Conference Chair



Filippo Salustri

Filippo Salustri
*Assistant Conference
Chair*



Antony Hodgson

Antony Hodgson
*Assistant Conference
Chair*

Welcome to Vancouver, Canada! The Organizing Committee of the 21st International Conference on Engineering Design (ICED17) is honoured to bring this premier Design conference to Canada for the first time in the history of the Design Society.

If you are reading this at the conference venue on the University of British Columbia campus, then you can readily see why UBC is considered one of the most stunning university settings in Canada, and indeed the world. Overlooking Vancouver Island to the west, and the wooded and craggy Coast Mountains to the north towards Whistler, you can readily appreciate why we chose “**Resource-Sensitive Design**” as the conference theme. Beyond the beauty of the setting, Vancouver is also home to vibrant forestry, natural resource, electronic media, biotech and transportation sector industries, and is a magnet for foreign engineers and students from all corners of the globe. These strong factors, along with the powerful First Nations presence in this region, underpin the conference’s three subthemes: *design for resource-limited societies*, *design to protect critical resources*, and *design to embrace resource limitations*. We sincerely hope you will join in celebrating this conference theme and, leave Vancouver with a renewed appreciation of the professional responsibility held by the membership of the Society to design our way to a better planet.

Beyond the conference theme, returning ICED attendees will see many familiar topics and will also see how these fields have evolved since the last ICED, joined by several new topics as well. The main Podium- and Discussion-format sessions are preceded by the more cutting-edge Monday Workshops organized by the Design Society’s Special Interest Groups: together these sessions are designed to provide attendees with ample opportunity to present, discuss, reflect on and contribute to the advancement of ideas in a wide variety of engineering design fields.

As in the past, ICED17 keynote lectures will unify the meeting, giving experts in the field the opportunity to communicate their visions for the future of the world in apposition to the themes of the conference. The six keynote speakers span the Design sector: from architecture to biotech, from materials to creativity, from regulatory agencies and government to engineering practice in society. We will all be wiser after hearing their reflections.

The Organizing Committee has created a conference that is rich in opportunity and nurturing in comforts – culinary, cultural and climate. We wish ICED17 attendees a most enjoyable experience in each other’s company and in fruitful scientific exchange.

PREFACE BY THE DESIGN SOCIETY PRESIDENT



A handwritten signature in black ink.

Dorian Marjanović

The Design Society President

Design thinking involves sensitivity for the past and the legacy that belongs to all, awareness of the present and current needs, envisioning of the future and the implications created by design. The ICED17 conference theme “Resource - Sensitive design” reflects these aspects: the local heritage, contemporary living and strivings as well as The Design Society goals and mission: “...to contribute to the broad and established understanding of all aspects of design and to promote the use of design to the betterment of humanity”.

ICED17 participants have a chance to experience the dynamics of the UBC campus and Vancouver that reflects all of the design dichotomies the old and new, the art and technology, the research and practice, the chaotic and systematic.

Since the first ICED conference held in Rome in 1981, the conference has become the event where the variety of design research from all the continents is presented, and all aspects of design explored. Design as a field has expanded tremendously, and the conference programme has become more interactive and involved, opening new opportunities and challenges.

Organising a conference with such a history takes an enormous amount of work and attention to details. The programme of ICED17 is the result of a joint effort from great teams that have been working together since the last ICED conference in Milan. ICED17 schedule is the result of continuous improvements in every aspect of conference organisation. These efforts provided an exciting opportunity for all the participants to learn about the latest developments in design research and practice.

On behalf of The Design Society, I would like to express sincere thanks to Organising Committee Chair Mike Van der Loos and all the colleagues in the Organising Committee and the team of The University of British Columbia who have made this conference happen.

Special thanks also to Programme Committee Chair Anja Maier, Assistant Programme Chair Stanko Škec and all the members of Programme Committee for their tremendous work in creating an exciting programme and for ensuring the high quality of the conference.

Finally, thank you to all the participants whose attendance and input are a constant sign that ICED conference and design as a field are going in the right direction. The Society extends its gratitude to all the authors who have submitted their contributions and all the reviewers who have helped to select papers ensuring an outstanding conference experience for all participants. A special thank you goes to all the presenters and Session Chairs who will make this experience possible.

The ICED17 conference continues the efforts and intention of The Design Society to foster design research in all the design facets.

ORGANISERS

ICED17 Design Society Programme Committee

Anja Maier – Technical University of Denmark (DTU), Denmark

Stanko Škec – University of Zagreb, Croatia

Harrison Kim – University of Illinois at Urbana-Champaign, United States of America

Michael Kokkolaras – McGill University

Josef Oehmen – Technical University of Denmark (DTU), Denmark

Georges Fadel – Clemson University, United States of America

Stephan Husung – :em engineering methods AG, Germany

Filippo Salustri – Ryerson University, Canada

Mike Van der Loos – The University of British Columbia, Canada

ICED17 Organising Committee

Mike Van der Loos – The University of British Columbia, Canada

Antony Hodgson – The University of British Columbia, Canada

Filippo Salustri – Ryerson University, Canada

Kamran Behdinan – University of Toronto, Canada

Agnes d'Entremont – The University of British Columbia, Canada

Tamara Etmannski – The University of British Columbia, Canada

Florin Gheorghe - The University of British Columbia, Canada

Chris McKesson – The University of British Columbia, Canada

Oscar Nespoli – University of Waterloo, Canada

Peter Ostafichuk – The University of British Columbia, Canada

The UBC Conferences and Accommodation Department



THE UNIVERSITY OF BRITISH COLUMBIA

SCIENTIFIC COMMITTEE

- Achiche, Sofiane** • École Polytechnique de Montréal, Canada
- Adams, Robin** • Purdue University, United States
- Agogino, Alice** • UC Berkeley, United States
- Albers, Albert** • Karlsruhe Institute of Technology (KIT), Germany
- Allen, Janet** • The University of Oklahoma, United States
- Allison, James** • University of Illinois at Urbana-Champaign, United States
- Almefelt, Lars** • Chalmers University of Technology, Sweden
- Anderl, Reiner** • Technische Universität Darmstadt, Germany
- Andrade, Ronaldo** • UFRJ Universidade Federal do Rio de Janeiro, Brazil
- Annamalai-Vasantha, Gokula** • University of Strathclyde, United Kingdom
- Aoussat, Améziane** • ENSAM, France
- Arai, Eiji** • Osaka University, Japan
- Arciszewski, Tomasz** • George Mason University, United States
- Atman, Cynthia** • University of Washington, United States
- Aurisicchio, Marco** • Imperial College London, United Kingdom
- Austin-Breneman, Jesse** • University of Michigan, United States
- Badke-Schaub, Petra** • Delft University of Technology, Netherlands
- Ballard, Herman** • UC Berkeley, United States
- Barone, Sandro** • Università di Pisa, Italy
- Becattini, Niccolò** • Politecnico di Milano, Italy
- Behdinan, Kamran** • University of Toronto, Canada
- Bencetic, Sanja** • University of Zagreb, Croatia
- Bender, Beate** • Ruhr University Bochum, Germany
- Benedicic, Janez** • University of Ljubljana, Slovenia
- Beneke, Frank** • University of Göttingen, Germany
- Benjamin, Stacy** • Northwestern University, United States
- Bertoni, Marco** • Blekinge Institute of Technology, Sweden
- Binz, Hansgeorg** • University of Stuttgart, Germany
- Birkhofer, Herbert** • Technische Universität Darmstadt, Germany
- Bjärnemo, Robert** • Lund University, Sweden
- Björk, Evestina** • Norwegian University of Science and Technology, Norway
- Blanco, Eric** • Université Grenoble Alpes, France
- Bloebaum, Christina** • Iowa State University, United States
- Boa, Duncan** • University of Bristol, United Kingdom
- Boelskifte, Per** • Technical University of Denmark, Denmark
- Bohemia, Erik** • Loughborough University, United Kingdom
- Bojetic, Nenad** • University of Zagreb, Croatia
- Boks, Casper** • Norwegian University of Science and Technology, Norway
- Bonjour, Eric** • Université de Lorraine, France
- Bordegoni, Monica** • Politecnico di Milano, Italy
- Borg, Jonathan** • University of Malta, Malta
- Borgianni, Yuri** • Free University of Bolzano-Bozen, Italy
- Boujut, Jean-François** • Université Grenoble Alpes, France
- Bouwhuis, Dominic** • Eindhoven University of Technology, Netherlands
- Braun, Andreas** • AVL Deutschland GmbH, Germany
- Braun, Thomas** • REDPOINT.TESEON AG, Germany
- Brei, Diann** • University of Michigan, United States
- Broberg, Ole** • Technical University of Denmark, Denmark
- Burchardt, Carsten** • Siemens Industry Software GmbH, Germany
- Burnap, Alex** • University of Michigan, United States
- Bursac, Nikola** • Karlsruhe Institute of Technology (KIT), Germany
- Burvill, Colin Reginald** • The University of Melbourne, Australia
- Bylund, Nicklas** • Sandvik Coromant, United States
- Cagan, Jonathan** • Carnegie Mellon University, United States
- Caillaud, Emmanuel** • University of Strasbourg, France
- Caldwell, Nicholas** • University of Suffolk, United Kingdom
- Camere, Serena** • Politecnico di Milano, Italy
- Campbell, Matt** • Oregon State University, United States
- Campbell, Robert Ian** • Loughborough University, United Kingdom

- Campean, Felician** • University of Bradford, United Kingdom
- Cantamessa, Marco** • Politecnico di Torino, Italy
- Carulli, Marina** • Politecnico di Milano, Italy
- Caruso, Giandomenico** • Politecnico di Milano, Italy
- Casakin, Hernan** • Ariel University, Israel
- Cascini, Gaetano** • Politecnico di Milano, Italy
- Cash, Philip** • Technical University of Denmark, Denmark
- Cavallucci, Denis** • INSA Strasbourg, France
- Chakrabarti, Amaresh** • Indian Institute of Science, India
- Chen, Wei** • Northwestern University, United States
- Childs, Peter R.N.** • Imperial College London, United Kingdom
- Choi, Young Mi** • Georgia Institute of Technology, United States
- Chulvi, Vicente** • Universitat Jaume I, Spain
- Clarkson, P. John** • University of Cambridge, United Kingdom
- Cluzel, Francois** • CentraleSupélec, Université Paris-Saclay, France
- Coatanéa, Eric** • Tampere University of Technology, Finland
- Coimbra Cardoso, Carlos** • Delft University of Technology, Netherlands
- Conrad, Jan** • Hochschule Kaiserslautern – University of Applied Sciences, Germany
- Cormican, Kathryn** • National University of Ireland Galway, Ireland
- Coutellier, Daniel** • University of Valenciennes et du Hainaut-Cambrésis, France
- Crilly, Nathan** • University of Cambridge, United Kingdom
- Culley, Steve** • University of Bath, United Kingdom
- Čok, Vanja** • University of Ljubljana, Slovenia
- D'Albert, Hugo** • Technical University of Munich, Germany
- De Bont, Cees** • The Hong Kong Polytechnic University, China
- De Guio, Roland** • INSA Strasbourg, France
- De Vries, Charlotte Marr** • Penn State Erie, The Behrend College, United States
- Dekoninck, Elies** • University of Bath, United Kingdom
- Del Curto, Barbara** • Politecnico di Milano, Italy
- D'Entremont, Agnes** • The University of British Columbia, Canada
- Dhokia, Vimal** • University of Bath, United Kingdom
- Dong, Andy** • The University of Sydney, Australia
- Donndelinger, Joseph A.** • Baylor University, United States
- Dorst, Kees** • University of Technology Sydney, Australia
- Duffy, Alex** • University of Strathclyde, United Kingdom
- Dumitrescu, Roman** • Fraunhofer Institute for Mechatronic Systems Design IEM, Germany
- Eckert, Claudia** • The Open University, United Kingdom
- Eifler, Tobias** • Technical University of Denmark, Denmark
- Eigner, Martin** • Technische Universität Kaiserslautern, Germany
- Eisenbart, Boris** • Delft University of Technology, Netherlands
- Ekman, Kalevi** • Aalto University, Finland
- Ellman, Asko Uolevi** • Tampere University of Technology, Finland
- Emrah Bayrak, Alparslan** • University of Michigan, United States
- Engelhardt, Roland** • Continental Teves AG & Co. oHG, Germany
- Eppinger, Steven** • Massachusetts Institute of Technology, United States
- Erbe, Torsten** • Jenoptik OS GmbH, Germany
- Ericson, Åsa** • Luleå University of Technology, Sweden
- Etmannski, Tamara** • The University of British Columbia, Canada
- Evans, Steve** • University of Cambridge, United Kingdom
- Eynard, Benoit** • UTC, Sorbonne Universités, France
- Fadel, Georges** • Clemson University, United States
- Fain, Nusa** • University of Strathclyde, United Kingdom
- Fan, Ip-Shing** • Cranfield University, United Kingdom
- Fantoni, Gualtiero** • Università di Pisa, Italy
- Fargnoli, Mario** • Ministry of Agriculture, Italy
- Farrugia, Philip** • University of Malta, Malta
- Ferrise, Francesco** • Politecnico di Milano, Italy
- Filippi, Stefano** • University of Udine, Italy
- Finger, Susan** • Carnegie Mellon University, United States
- Fischer, Xavier** • ESTIA, France
- Fortin, Clement** • Skolkovo Institute of Science and Technology (Skoltech), Russia
- Frankenberger, Eckart** • Airbus, Germany

SCIENTIFIC COMMITTEE

- Frise, Peter** • University of Windsor, Canada
- Fu, Katherine Kai-Se** • Georgia Institute of Technology, United States
- Fuge, Mark** • University of Maryland, United States
- Fujita, Kikuo** • Osaka University, Japan
- Fukuda, Shuichi** • Keio University, Japan
- Fukushige, Shinichi** • Osaka University, Japan
- Gardon, Mickael** • École de Technologie Supérieure (ÉTS) / INSA Strasbourg, Canada
- Gatti, Elia** • University of Sussex, United Kingdom
- Georgiev, Georgi** • University of Oulu, Finland
- Gerhard, Detlef** • TU Wien, Austria
- Gericke, Kilian** • University of Luxembourg, Luxembourg
- Gero, John** • UNC Charlotte / George Mason University, United States
- Gibson, Ian** • Deakin University, Australia
- Göbel, Jens Christian** • Ruhr University Bochum, Germany
- Goel, Ashok** • Georgia Institute of Technology, United States
- Goh, Yee Mey** • Loughborough University, United Kingdom
- Goker, Mehmet** • Salesforce.com, United States
- Goldschmidt, Gabriela** • Technion - Israel Institute of Technology, Israel
- Gooch, Shayne** • University of Canterbury, New Zealand
- Gopsill, James Anthony** • University of Bath, United Kingdom
- Governi, Lapo** • University of Florence, Italy
- Graessler, Iris** • Paderborn University, Germany
- Graziosi, Serena** • Politecnico di Milano, Italy
- Grimheden, Martin** • KTH Royal Institute of Technology, Sweden
- Guagliano, Mario** • Politecnico di Milano, Italy
- Guerra, Andrea Luigi** • UTC, Sorbonne Universités, France
- Guest, James** • Johns Hopkins University, United States
- Gupta, Ravi Kumar** • École Centrale de Nantes, France
- Gurumoorthy, Balan** • Indian Institute of Science, India
- Gzara, Lilia** • Grenoble Institute of Technology, France
- Hales, Crispin** • Hales & Gooch Ltd., United States
- Hall, John** • University at Buffalo, United States
- Hallstedt, Sophie** • Blekinge Institute of Technology, Sweden
- Hansen, Zaza Nadja Lee** • Technical University of Denmark, Denmark
- Hansen, Claus Thorp** • Technical University of Denmark, Denmark
- Hassannezhad, Mohammad** • University of Cambridge, United Kingdom
- Hasse, Alexander** • Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- Hatchuel, Armand** • MINES ParisTech, France
- Hehenberger, Peter** • University of Applied Sciences Upper Austria, Austria
- Heo, Yeonsook** • University of Cambridge, United Kingdom
- Hepperle, Clemens** • TESIS DYNAware GmbH, Germany
- Herrmann, Jeffrey William** • University of Maryland, United States
- Heydari, Babak** • Stevens Institute of Technology, United States
- Hicks, Ben** • University of Bristol, United Kingdom
- Hodgson, Antony** • The University of British Columbia, Canada
- Hoffenson, Steven** • Stevens Institute of Technology, United States
- Höhne, Günter** • Technische Universität Ilmenau, Germany
- Holmlid, Stefan** • Linköping University, Sweden
- Hölttä-Otto, Katja** • Singapore University of Technology and Design, Singapore
- Hong, Yoo Suk** • Seoul National University, South Korea
- Horvath, Imre** • Delft University of Technology, Netherlands
- Howard, Thomas** • Technical University of Denmark, Denmark
- Husung, Stephan** • :em engineering methods AG, Germany
- Ijomah, Winifred** • University of Strathclyde, United Kingdom
- Ilies, Horea** • University of Connecticut, United States
- Imholz, Susan** • Independen author and researcher, United States
- Ion, William** • University of Strathclyde, United Kingdom
- Isaksson, Ola** • Chalmers University of Technology, Sweden
- Jablokow, Kathryn** • The Pennsylvania State University, United States
- Jackson, Mats** • Mälardalen University, Sweden

Jagtap, Santosh • Blekinge Institute of Technology, Sweden
Jamieson, Marnie • University of Alberta, Canada
Jankovic, Marija • CentraleSupélec, Université Paris-Saclay, France
Jiao, Roger • Georgia Institute of Technology, United States
Johansson, Glenn • Mälardalen University, Sweden
Johnson, Aylmer • University of Cambridge, United Kingdom
Jowers, Iestyn • The Open University, United Kingdom
Junaidy, Deny • Universiti Malaysia Kelantan, Malaysia
Jurcevic Lulic, Tanja • University of Zagreb, Croatia
Kang, Namwoo • KAIST, South Korea
Kannengiesser, Udo • Metasonic GmbH, Germany
Karlsson, Anna Sofie • Luleå University of Technology, Sweden
Karlsson, Lennart • Alkit Communications AB, Sweden
Kazakci, Akin Osman • MINES ParisTech, France
Keates, Simeon • University of Greenwich, United Kingdom
Keldmann, Troels • Keldmann Healthcare A/S, Denmark
Kim, Yong Se • Sungkyunkwan University, South Korea
Kim, Harrison • University of Illinois at Urbana-Champaign, United States
Kipouros, Timoleon • University of Cambridge, United Kingdom
Kishita, Yusuke • The University of Tokyo, Japan
Kitamura, Yoshinobu • Osaka University, Japan
Kleinsmann, Maaike • Delft University of Technology, Netherlands
Koh, Edwin • National University of Singapore, Singapore
Köhler, Christian • htw saar, Saarland University of Applied Sciences, Germany
Kokkolaras, Michael • McGill University, Canada
Komoto, Hitoshi • National Institute of Advanced Industrial Science and Technology, Japan
Kota, Srinivas • Birla Institute of Technology and Science Pilani, India
Kovacevic, Ahmed • City, University of London, United Kingdom
Krause, Dieter • Hamburg University of Technology, Germany
Krauss, Gordon • Harvey Mudd College, United States

Kreimeyer, Matthias • MAN Truck & Bus AG, Germany
Kristensen, Tore • Copenhagen Business School, Denmark
Kroll, Ehud • ORT Braude College, Israel
Krämer, Heidi • Technische Universität Ilmenau, Germany
Kruchten, Philippe • The University of British Columbia, Canada
Kuosmanen, Petri • Aalto University, Finland
Kwak, Minjung • Soongsil University, South Korea
Lachmayer, Roland • Leibniz Universität Hannover, Germany
Larsson, Tobias • Blekinge Institute of Technology, Sweden
Layton, Astrid • Texas A&M University, United States
Le Masson, Pascal • MINES ParisTech, France
Leary, Martin • RMIT University, Australia
Lecomte, Chloe • Haute-Ecole ARC, Switzerland
Lee, Ik Jin. • KAIST, South Korea
Lee, Sang Won • Sungkyunkwan University, South Korea
Legardeur, Jeremy • ESTIA, France
Lenau, Torben Anker • Technical University of Denmark, Denmark
Lewis, Kemper • University at Buffalo, United States
Li, Mian • Shanghai Jiao Tong University, China
Liem, André • Norwegian University of Science and Technology, Norway
Lindahl, Mattias • Linköping University, Sweden
Lindemann, Udo • Technical University of Munich, Germany
Linsey, Julie • Georgia Institute of Technology, United States
Liu, Ying • Cardiff University, United Kingdom
Lloveras, Joaquim • Universitat Politècnica de Catalunya, Spain
Lohmeyer, Quentin • ETH Zurich, Switzerland
Long, David Scott • University of Dayton, United States
Lugnet, Johan • Luleå University of Technology, Sweden
Mabogunje, Ade • Stanford University, United States
MacCarty, Nordica • Oregon State University, United States
MacDonald, Erin • Stanford University, United States
Maier, Anja • Technical University of Denmark, Denmark
Malmqvist, Johan Lars • Chalmers University of Technology, Sweden

SCIENTIFIC COMMITTEE

- Manfredi, Enrico** • Università di Pisa, Italy
- Mansouri, Mo** • Stevens Institute of Technology, United States
- Marjanovic, Dorian** • University of Zagreb, Croatia
- Marle, Franck** • CentraleSupélec, Université Paris-Saclay, France
- Matsumae, Akane** • Saga University, Japan
- Matta, Nada** • University of Technology of Troyes, France
- Matthews, Jason Anthony** • University of the West of England, United Kingdom
- Matthiesen, Sven** • Karlsruhe Institute of Technology (KIT), Germany
- Maurer, Christiane** • Independent designer and researcher, Netherlands
- Maurer, Maik** • Akamai Technologies, United States
- Maw, Sean** • University of Saskatchewan, Canada
- McAloone, Tim** • Technical University of Denmark, Denmark
- McDonnell, Janet** • Central Saint Martins, United Kingdom
- McKay, Alison** • University of Leeds, United Kingdom
- McKesson, Chris** • The University of British Columbia, Canada
- McMahon, Christopher** • Technical University of Denmark, Denmark
- Meboldt, Mirko** • ETH Zurich, Switzerland
- Mekhilef, Mounib** • University of Orleans, France
- Merlo, Christophe** • ESTIA, France
- Michelin, Fabien** • University of Technology of Troyes, France
- Mocko, Gregory** • Clemson University, United States
- Moehringer, Stefan** • Simon Moehringer Anlagenbau GmbH, Germany
- Mombeshora, Mandy** • University of Bath, United Kingdom
- Monceaux, Anne** • Airbus, France
- Montagna, Francesca** • Politecnico di Torino, Italy
- Moon, Seung Ki** • Nanyang Technological University, Singapore
- Morkos, Beshoy** • Florida Institute of Technology, United States
- Mortensen, Niels Henrik** • Technical University of Denmark, Denmark
- Mörtl, Markus** • Technical University of Munich, Germany
- Moultrie, James** • University of Cambridge, United Kingdom
- Mourelatos, Zissimos P.** • Oakland University, United States
- Muenzberg, Christopher** • Technical University of Munich, Germany
- Mulet, Elena** • Universitat Jaume I, Spain
- Mullineux, Glen** • University of Bath, United Kingdom
- Nagai, Yukari** • Japan Advanced Institute of Science and Technology (JAIST), Japan
- Nespoli, Oscar** • University of Waterloo, Canada
- Nicquevert, Bertrand** • CERN, Switzerland
- Nomaguchi, Yutaka** • Osaka University, Japan
- Norato, Julián Andrés** • University of Connecticut, United States
- Norell Bergendahl, Margareta** • KTH Royal Institute of Technology, Sweden
- Oehmen, Josef** • Technical University of Denmark, Denmark
- Öhrwall Rönnbäck, Anna** • Luleå University of Technology, Sweden
- Olechowski, Alison** • Massachusetts Institute of Technology, United States
- Olsson, Annika** • Lund University, Sweden
- Ölvander, Johan** • Linköping University, Sweden
- Onkar, Prasad** • Indian Institute of Technology Hyderabad, India
- Ostafichuk, Peter** • The University of British Columbia, Canada
- Otto, Kevin** • Aalto University, Finland
- Ottosson, Stig** • Norwegian University of Science and Technology, Norway
- Paetzold, Kristin** • Universität der Bundeswehr München, Germany
- Panchal, Jitesh** • Purdue University, United States
- Papalambros, Panos** • University of Michigan, United States
- Paredis, Chris** • Georgia Institute of Technology, United States
- Parraguez Ruiz, Pedro** • Technical University of Denmark, Denmark
- Patou, François** • Technical University of Denmark, Denmark

- Pavkovic, Neven** • University of Zagreb, Croatia
- Peruzzini, Margherita** • University of Modena and Reggio Emilia, Italy
- Peters, Diane** • Kettering University, United States
- Petiot, Jean-François** • Centrale Nantes, France
- Piacenza, Joseph** • California State University, Fullerton, United States
- Pigosso, Daniela** • Technical University of Denmark, Denmark
- Piirainen, Kalle** • Technical University of Denmark, Denmark
- Posner, Benedikt** • Andreas STIHL AG & Co. KG, Germany
- Prakash, Raghu Vasu** • Indian Institute of Technology Madras, India
- Pulm, Udo** • BMW Motorrad, Germany
- Qureshi, Ahmed Jawad** • University of Alberta, Canada
- Radkowski, Rafael** • Iowa State University, United States
- Rai, Rahul** • University at Buffalo, United States
- Raine, John Kenneth** • Auckland University of Technology, New Zealand
- Ravn, Poul Martin** • Technical University of Denmark, Denmark
- Ray, Pascal** • École Nationale Supérieure des Mines de Saint-Etienne, France
- Reed, Matthew** • University of Michigan, United States
- Reich, Yoram** • Tel Aviv University, Israel
- Reid, Tahira** • Purdue University, United States
- Remmen, Arne** • Aalborg University, Denmark
- Reyes, Tatiana** • University of Technology of Troyes, France
- Riel, Andreas Erik** • Grenoble Institute of Technology, France
- Ringen, Geir** • Norwegian University of Science and Technology, Norway
- Ritzén, Sofia** • KTH Royal Institute of Technology, Sweden
- Rizzi, Caterina** • University of Bergamo, Italy
- Robotham, Antony John** • Plymouth University, United Kingdom
- Rohmer, Serge** • University of Technology of Troyes, France
- Roth, Bernard** • Stanford University, United States
- Rotini, Federico** • University of Florence, Italy
- Roucoules, Lionel** • ENSAM, France
- Rovida, Edoardo** • Politecnico di Milano, Italy
- Rozenfeld, Henrique** • University of São Paulo, Brazil
- Russo, Davide** • University of Bergamo, Italy
- Sakao, Tomohiko** • Linköping University, Sweden
- Salehi, Vahid** • Munich University of Applied Sciences, Germany
- Salustri, Filippo Arnaldo** • Ryerson University, Canada
- Sarkar, Prabir** • Indian Institute of Technology Ropar, India
- Sarkar, Somwrita** • The University of Sydney, Australia
- Sato, Keiichi** • Illinois Institute of Technology, United States
- Savsek, Tomaz** • TPV Group, Slovenia
- Schabacker, Michael** • Otto-von-Guericke-University Magdeburg, Germany
- Schaefer, Dirk** • University of Bath, United Kingdom
- Schaub, Harald** • IABG mbH, Germany
- Schmidt, Linda** • University of Maryland, United States
- Seepersad, Carolyn Conner** • The University of Texas at Austin, United States
- Seering, Warren** • Massachusetts Institute of Technology, United States
- Sen, Chiradeep** • Florida Institute of Technology, United States
- Sen, Dibakar** • Indian Institute of Science, Bangalore, India
- Setchi, Rossi** • Cardiff University, United Kingdom
- Shea, Kristina** • ETH Zurich, Switzerland
- Shimomura, Yoshiki** • Tokyo Metropolitan University, Japan
- Shu, Lily** • University of Toronto, Canada
- Siadat, Ali** • ENSAM, France
- Sigurjónsson, Jóhannes B.** • Norwegian University of Science and Technology, Norway
- Simpson, Timothy W.** • The Pennsylvania State University, United States
- Singh, Vishal** • Aalto University, Finland
- Snider, Chris** • University of Bristol, United Kingdom
- Söderberg, Rikard** • Chalmers University of Technology, Sweden
- Sonalkar, Neeraj** • Stanford University, United States
- Sosa, Ricardo** • Monash University / Auckland University of Technology, New Zealand

SCIENTIFIC COMMITTEE

- Souza da Conceição, Carolina** • Technical University of Denmark, Denmark
- Spitas, Christos** • Delft University of Technology, Netherlands
- Stal-Le Cardinal, Julie** • CentraleSupélec, Université Paris-Saclay, France
- Stankovic, Tino** • ETH Zurich, Switzerland
- Stappers, Pieter Jan** • Delft University of Technology, Netherlands
- Stark, Rainer** • Technische Universität Berlin, Germany
- Stauffer, Larry** • University of Idaho, United States
- Steinert, Martin** • Norwegian University of Science and Technology, Norway
- Stetter, Ralf** • University of Applied Sciences Ravensburg-Weingarten, Germany
- Stevanovic, Milan** • Markot.tel. Ltd., Croatia
- Stjepandic, Josip** • PROSTEP AG, Germany
- Storga, Mario** • University of Zagreb, Croatia
- Subrahmanian, Eswaran** • Carnegie Mellon University, United States
- Suh, Eun Suk** • Seoul National University, South Korea
- Summers, Joshua** • Clemson University, United States
- Sundin, Erik** • Linköping University, Sweden
- Škec, Stanko** • University of Zagreb, Croatia
- Tahera, Khadija** • University of Huddersfield, United Kingdom
- Tan, James Ah Kat** • Ngee Ann Polytechnic, Singapore
- Taura, Toshiharu** • Kobe University, Japan
- Telenko, Cassandra** • Georgia Institute of Technology, United States
- Thallemer, Axel** • National University of Singapore, Singapore
- Thoben, Klaus-Dieter** • University of Bremen, Germany
- Thompson, Mary Kathryn** • GE Additive, United States
- Thomson, Avril** • University of Strathclyde, United Kingdom
- Thurston, Deborah** • University of Illinois at Urbana-Champaign, United States
- Todeti, Somasekhara Rao** • National Institute of Technology Karnataka, Surathkal, India
- Tollenaere, Michel** • Grenoble Institute of Technology, France
- Törnlind, Peter** • Luleå University of Technology, Sweden
- Tovar, Andres** • Indiana University-Purdue University Indianapolis, United States
- Troussier, Nadege** • University of Technology of Troyes, France
- Tucker, Conrad** • The Pennsylvania State University, United States
- Turner, Cameron** • Clemson University, United States
- Uflacker, Matthias** • Hasso Plattner Institute, Germany
- Umeda, Yasushi** • The University of Tokyo, Japan
- Vajna, Sandor** • Otto-von-Guericke-University Magdeburg, Germany
- Valderrama Pineda, Andres Felipe** • Aalborg University, Denmark
- van der Bijl-Brouwer, Mieke** • University of Technology Sydney, Australia
- Van der Loos, Mike** • The University of British Columbia, Canada
- Vaneker, Tom Henricus Jozef** • University of Twente, Netherlands
- Venkataraman, Srinivasan** • Singapore University of Technology and Design, Singapore
- Vermaas, Pieter** • Delft University of Technology, Netherlands
- Victor, Thomas** • Technische Universität Braunschweig, Germany
- Vukasinovic, Nikola** • University of Ljubljana, Slovenia
- Vukic, Fedja** • University of Zagreb, Croatia
- Walter, Michael** • Ansbach University of Applied Sciences, Germany
- Wang, Yan** • Georgia Institute of Technology, United States
- Wang, Charlie** • Delft University of Technology, Netherlands
- Wang, Pingfeng** • Wichita State University, United States
- Wang, Yue** • Hang Seng Management College, Hong Kong
- Wartzack, Sandro** • Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- Watanabe, Kentaro** • National Institute of Advanced Industrial Science and Technology, Japan
- Watty, Robert** • University of Applied Sciences Ulm, Germany

- Weber, Christian** • Technische Universität Ilmenau, Germany
- Weil, Benoit** • MINES ParisTech / PSL Research University, France
- Weiss, Menachem Peter** • Technion - Israel Institute of Technology, Israel
- Wendrich, Robert** • University of Twente, Netherlands
- Whitefoot, Kate** • Carnegie Mellon University, United States
- Whitfield, Ian** • University of Strathclyde, United Kingdom
- Whitney, Daniel** • Massachusetts Institute of Technology, United States
- Wilkinson, Christopher Raphael** • IncluSign, United Kingdom
- Winkelman, Paul Martin** • The University of British Columbia, Canada
- Witherell, Paul** • National Institute of Standards and Technology (NIST), United States
- Wodehouse, Andrew James** • University of Strathclyde, United Kingdom
- Wood, Kristin** • Singapore University of Technology and Design, Singapore
- Wynn, David** • The University of Auckland, New Zealand
- Yamada, Kaori** • Kobe University, Japan
- Yanagisawa, Hideyoshi** • The University of Tokyo, Japan
- Yang, Maria** • Massachusetts Institute of Technology, United States
- Yannou, Bernard** • CentraleSupélec, Université Paris-Saclay, France
- Yannou-Le Bris, Gwenola** • AgroParisTech, France
- Yousif, Tamer Mohammed** • Canadian International College, Egypt
- Zainal Abidin, Shahriman** • Universiti Teknologi MARA, Malaysia
- Zavbi, Roman** • University of Ljubljana, Slovenia
- Zelaya, Jader** • Japan Advanced Institute of Science and Technology (JAIST), Japan
- Zeng, Yong** • Concordia University, Canada
- Zezelj, Dragan** • University of Zagreb, Croatia
- Zhang, Zai Fang** • Shanghai University, China
- Zolghadri, Marc** • Supmeca, France

TABLE OF CONTENTS

Volume 1: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Resource-Sensitive Design | Design Research Applications and Case Studies

Resource-Sensitive Design

Challenges and preconditions to build capabilities for sustainable product design	1-1
<i>Schulte, Jesko; Hallstedt, Sophie</i>	
A tool for assessing customers' barriers for consuming remanufactured products.....	1-11
<i>Almefelt, Lars; Rexfelt, Oskar</i>	
Design for resource-limited societies: Informational behaviour of designers	1-21
<i>Jagtap, Santosh; Larsson, Andreas; Warell, Anders</i>	
Design for complex product rebirth or how to protect resources.....	1-31
<i>Masle, Christian</i>	
Helping inhabitants in energy saving and getting inputs from usage for eco-design: Cooking case study	1-41
<i>Abi Akle, Audrey; Lizarralde, Iban</i>	
A process for designing lean- and sustainable production.....	1-51
<i>Jaghbeer, Yasmeen; Motyka, Yvonne; Hallstedt, Sophie</i>	
Mindfulness and resource-sensitive design: A literature overview and an agenda for research.....	1-61
<i>Chan, Wing Mui Helen; de Bont, Cees</i>	
Mixed-flow irrigation pump design optimization for Bangladesh.....	1-71
<i>Yu, Su; Colton, Jonathan S.</i>	
Hybrid top-down and bottom-up framework to measure products' circularity performance	1-81
<i>Saidani, Michael; Yannou, Bernard; Leroy, Yann; Cluzel, François</i>	
Passive monitoring in the workplace: Design guidelines for self quantified employee feedback system	1-91
<i>Tufail, Muhammad; Lee, Haebin; Kim, Myungjin; Kim, KwanMyung</i>	
Using TheDesignExchange as a knowledge platform for human-centered design-driven global development.....	1-101
<i>Kramer, Julia; Poreh, Danielle; Agogino, Alice</i>	
Is this system eco-innovative? A case-based workshop	1-111
<i>Vallet, Flore; Tyl, Benjamin; Pialot, Olivier; Millet, Dominique</i>	
Methodology for multiple life cycles product ecodesign	1-121
<i>Troussier, Nadege; Sirina, Natalia; Adragna, Pierre-Antoine; Amaya, Jorge; Reyes, Tatiana</i>	
Technical planning tasks and participants involved in planning Adaptive Buildings	1-131
<i>Honold, Clemens; Binz, Hansgeorg; Roth, Daniel</i>	
An eco-innovation method for products in Bottom of the Pyramid (BoP).....	1-141
<i>Chen, Jahau Lewis; Chung, Shih-Hou</i>	
Using local invasive species and flora to manufacture collagen based biodegradable plastic tableware	1-151
<i>Willett, Kathryn; Howell, Bryan</i>	
Overdesign in building services: the hidden energy use	1-159
<i>Jones, Darren; Eckert, Claudia</i>	
Telepathic product design for water conservation	1-169
<i>Ramaswamy, Naren; MacDonald, Erin</i>	

TABLE OF CONTENTS

Building a business case for ecodesign implementation: A system dynamics approach	1-179
<i>Rodrigues, Vinícius; Pigozzo, Daniela; McAlone, Tim</i>	
Teaching systemic design for sustainability in engineering by building eco skis.....	1-189
<i>Luthe, Tobias; Lumpe, Thomas; Schwarz, Jonas; Schütz, Martin; Shea, Kristina</i>	
Environmental impacts during the product usage - Identification and categorisation of influencing factors.....	1-199
<i>Kattwinkel, Daniela; Herzog, Michael; Neumann, Marc; Bender, Beate</i>	
Is product design evil?	1-209
<i>Coutts, Euan Ross; Edward, Jack; Knight, Richard; Duffy, Alex; Grierson, Hilary</i>	
Design for micro-enterprise: a field study of user preference behavior	1-219
<i>Austin-Breneman, Jesse; Yang, Maria</i>	
Economic development as design: Insight and guidance through the PSI framework.....	1-229
<i>Subrahmanian, Eswaran; Eckert, Claudia; McMahon, Christopher; Reich, Yoram</i>	
An exploratory study to integrate feasibility into the eco-design process: An approach to link design and environmental parameters	1-239
<i>Bratec, Florian; Matta, Nada; Reyes, Tatiana; Troussier, Nadège; Diaz Pichardo, René; Voinot, Thibaut; Jouanne, Guillaume</i>	
Improving needs-finding techniques for medical device development at low resource environments using Activity Theory	1-249
<i>Rismani, Shalaleh; Van der Loos, H. F. Machiel</i>	
Co-design in Zambia - an examination of design outcomes.....	1-259
<i>Brubaker, Eric Reynolds; Jensen, Carl; Silungwe, Sunday; Sheppard, Sheri D.; Yang, Maria</i>	

TABLE OF CONTENTS

Design Research Applications and Case Studies

Selective pre-load generation: Finding manufacturing-integrated solutions for linear guides.....	1-269
<i>Roos, Michael; Wagner, Christian; Gramlich, Sebastian; Reichwein, Jannik; Kirchner, Eckhard</i>	
Experimental and simulative assessment of crashworthiness of mechanically aged short-fibre reinforced thermoplastics.....	1-279
<i>Witzgall, Christian; Wartzack, Sandro</i>	
A semi-formal approach to structure and access knowledge for multi-material-design.....	1-289
<i>Kleemann, Sebastian; Inkermann, David; Bader, Benjamin; Türck, Eiko; Vietor, Thomas</i>	
Generic approach to plausibility checks for structural mechanics with deep learning.....	1-299
<i>Spruegel, Tobias; Schröppel, Tina; Wartzack, Sandro</i>	
A qualitative study to identify the need and requirements on further development of design guidelines for fibre-reinforced composites.....	1-309
<i>Butenko, Viktorija; Wilwer, Jürgen; Spadinger, Markus; Albers, Albert</i>	
Value-driven engineering design: Lessons learned from the road construction equipment industry	1-319
<i>Bertoni, Marco; Panarotto, Massimo; Jonsson, Pontus</i>	
Fiber-reinforced composite design within a lightweight and material-oriented development process	1-329
<i>Kaspar, Jerome; Vielhaber, Michael</i>	
The frame network of interdisciplinary stakeholder compositions in the early phases of new product development	1-339
<i>Andersen, Alexander Kjær; Nafei, Nadiim; Planck, Michael; Nielsen, Louise Møller</i>	
A design case study: Transferring design processes and prototyping principles into industry for rapid response and user impact	1-349
<i>Sng, Karen Hui En; Raviselvam, Sujithra; Anderson, David; Blessing, Lucienne; Camburn, Bradley Adam; Wood, Kristin</i>	
Improving inclusive design practice - transferring knowledge from sports design practice.....	1-359
<i>Wilson, Nicky; Thomson, Avril; Riches, Philip</i>	
Digital representation of product functions in multicopter design	1-369
<i>Ramsaier, Manuel; Holder, Kevin; Zech, Andreas; Stetter, Ralf; Rudolph, Stephan; Till, Markus</i>	
A decade trend of utilization of design tools and methods in Japanese product industries.....	1-379
<i>Nomaguchi, Yutaka; Takami, Masashi; Sakaguchi, Anna; Fujita, Kikuo</i>	
A concept and prototype for a new app to support collaborative and multi- criteria decision making in product development.....	1-389
<i>Luft, Thomas; Rupprecht, Simon; Wartzack, Sandro</i>	
Pattern recognition for the integration of mechanical simulations in product development workflows	1-399
<i>Schweigert, Sebastian; Schöner, Martin; Lindemann, Udo</i>	
Multi-criteria analysis of multi-material lightweight components on a conceptual level of detail	1-409
<i>Fröhlich, Tim; Kleemann, Sebastian; Türck, Eiko; Vietor, Thomas</i>	
Holistic approach for design and re-design of production units.....	1-419
<i>Stäbler, Markus; Weber, Jakob; Paetzold, Kristin; Vielhaber, Michael</i>	
Application of product development process (PDP) in the construction of vertical axis wind turbine with movable blades.....	1-429
<i>Santiago, George; Hernandez, Willmari; Costa de Araujo, Ana Cláudia; Rosa, Marcela; González, Mario</i>	

Material selection - A qualitative case study of five design consultancies.....	1-439
<i>Asbjorn Sorensen, Charlotte; Warell, Anders; Jagtap, Santosh</i>	
Development of a tongue machine interface for quadriplegic patients.....	1-449
<i>Velásquez-López, Alejandro; Velásquez-Rendón, David; Amaya-Quiroz, Juan Sebastian; Jimenez-Franco, Luis David; Trefftz, Helmuth</i>	
Measuring frugality - application to a solar water distiller.....	1-459
<i>Rohmer, Serge; Merabtine, Abdelatif; Bouzidi, Youcef</i>	
Foot plantar pressure offloading: How to select the right material for a custom made insole.....	1-469
<i>Mandolini, Marco; Brunzini, Agnese; Manieri, Steve; Germani, Michele</i>	
Biofidelic design of the forearm of a myoelectric prosthesis with maximum functional volume	1-479
<i>Ramananarivo, Mathieu; Raison, Maxime; Barron, Olivier; Achiche, Sofiane</i>	
Graph-based similarity analysis of BOM data to identify unnecessary inner product variance.....	1-489
<i>Schmidt, Michael; Gehring, Benedikt; Gerber, Jan-Sebastian; Stocker, Johannes Michael; Kreimeyer, Matthias; Lienkamp, Markus</i>	
Design of human-powered hybrid electric-power shovel for deep excavation	1-499
<i>Matsuura, Naoki; Hatano, Yuji; Iizuka, Teppei; Fujisawa, Tatsuro; Wesugi, Shigeru</i>	
Reverse natures: Design synthesis of Texture-Based Metamaterials (TBMs).....	1-509
<i>Patel, Sayjal Vijay; Mignone, Paul John; Tam, Mark Kam-Ming; Rosen, David</i>	
Engineering of assembly systems using graph-based design languages	1-519
<i>Breckle, Theresa; Kiefer, Jens; Rudolph, Stephan; Manns, Martin</i>	
A concept of an integrated system for monitoring changes on the human skin.....	1-529
<i>Zezelj, Dragan; Bojetic, Nenad; Pletikapic Exle, Latica</i>	
On the design of Len Lye's Flaming Harmonic.....	1-539
<i>McGregor, Angus; Gooch, Shayne; Webb, Evan</i>	

TABLE OF CONTENTS

Volume 2: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Design Processes | Design Organisation and Management

Design Processes

A tool to support project time evaluation	2-1
<i>Bojcetic, Nenad; Zezelj, Dragan; Salopek, Damir; Valjak, Filip</i>	
Using data- and network science to reveal iterations and phase-transitions in the design process	2-11
<i>Piccolo, Sebastiano; Lehmann, Sune; Maier, Anja</i>	
An exploratory study into the impact of new digital design and manufacturing tools on the design process	2-21
<i>Corsini, Lucia; Moultrie, James</i>	
A guide to investigating design process models context of use	2-31
<i>Costa, Daniel Guzzo; Costa, Janaina; Rozenfeld, Henrique</i>	
A comparison of design decisions made early and late in development	2-41
<i>Tan, James; Otto, Kevin; Wood, Kristin</i>	
Eliciting configuration design heuristics with hidden Markov models.....	2-51
<i>McComb, Christopher; Cagan, Jonathan; Kotovsky, Kenneth</i>	
Using clustering algorithms to identify subproblems in design processes.....	2-61
<i>Morency, Michael; Anparasan, Azrah; Herrmann, Jeffrey; Gralla, Erica</i>	
Introducing constraints to enhance integration at the design-manufacturing interface of new product development	2-71
<i>Bix, Susanne</i>	
Context-specific process design: An integrated process lifecycle model and situations for context factor use	2-81
<i>Hollauer, Christoph; Wilberg, Julian; Omer, Mayada; Lindemann, Udo</i>	
Modelling the design parameters dynamics with Petri nets.....	2-91
<i>Juranic, Jasmin; Pavkovic, Neven; Naumann, Thomas; Marjanovic, Dorian</i>	
A computational approach to expose conversation dynamics in engineering design activities	2-101
<i>Wulvik, Andreas; Menning, Axel; Steinert, Martin</i>	
Current state of practices in open source product development.....	2-111
<i>Bonvoisin, Jérémie; Thomas, Laetitia; Mies, Robert; Gros, Céline; Stark, Rainer; Samuel, Karine; Jochem, Roland; Boujut, Jean-François</i>	
Towards a model of the open-design process: Using the grounded theory for modelling implicit design processes	2-121
<i>Boisseau, Etienne; Bouchard, Carole; Omhover, Jean-François</i>	
An information model to estimate efforts of product development processes	2-131
<i>Dittmann, Claudia; Jacobs, Georg; Felix, Valerie</i>	
Process model for change management in the system of chassis-mounted parts of commercial vehicles	2-139
<i>Stocker, Johannes Michael; Thoma, Christoph; Schmidt, Michael; Kreimeyer, Matthias; Lienkamp, Markus</i>	
Parameter control assisting morphological product conceptualization of multi-technology-machine-tools.....	2-149
<i>Schmid, Alexander; Jacobs, Georg; Löwer, Manuel; Katzwinkel, Tim; Schmidt, Walter; Siebrecht, Justus</i>	
Efficient application of optimization methods by using concurrent and simultaneous optimization	2-159
<i>Wiunsch, Andreas; Vajna, Sandor</i>	

Design Organisation and Management

Connecting strategy and execution in global R&D	2-169
<i>Sbernini, Federico; Granini, Nicola; Hansen, Zaza Nadja Lee</i>	
Modelling and simulating the effect of coordination on PD performance while handling change	2-179
<i>Rajapaksha, Janaka; Mirkovic, Katja; Robinson, David; Wynn, David</i>	
Identifying product development crises: The potential of adaptive heuristics.....	2-189
<i>Muenzberg, Christopher; Stingl, Verena; Geraldi, Joana; Oehmen, Josef</i>	
Neural network-based survey analysis of risk management practices in new product development.....	2-199
<i>Kampianakis, Andreas; Oehmen, Josef</i>	
Engineering design resource planning: A case study in identifying resource forecasting opportunities in research project planning.....	2-209
<i>Holliman, Alexander; Thomson, Avril; Hird, Abigail</i>	
Dynamic modelling of relationships in complex service design systems.....	2-219
<i>Hassannezhad, Mohammad; Cassidy, Steve; Clarkson, P. John</i>	
Design thinking - a paradigm	2-229
<i>Laursen, Linda Nhu; Tollestrup, Christian</i>	
Integrated approach to the agile development with design thinking in an industrial environment.....	2-239
<i>Grashiller, Michael; Luedke, Tobias; Vielhaber, Michael</i>	
Usability of processes in engineering design	2-249
<i>Becerril, Lucia; Stahlmann, Jan-Timo; Beck, Jesco; Lindemann, Udo</i>	
Challenges in managing new product introduction projects: An explorative case study	2-259
<i>Chirumalla, Koteswar</i>	
Applying lean thinking to risk management in product development	2-269
<i>Willumsen, Pelle; Oehmen, Josef; Rossi, Monica; Welo, Torgeir</i>	
Towards cross-linked development of highly complex products.....	2-279
<i>Toepfer, Ferdinand; Naumann, Thomas</i>	
Design of flexible product development processes - An automotive case study.....	2-289
<i>Hollauer, Christoph; Frisch, Bianca; Wilberg, Julian; Omer, Mayada; Lindemann, Udo</i>	
Identifying the influences on performance of engineering design and development projects	2-299
<i>Snider, Chris; Emanuel, Lia; Gopsill, James; Joel-Edgar, Sian; Hicks, Ben</i>	
On characterization of technology readiness level coefficients for design.....	2-309
<i>Fahimian, Mahi; Behdinan, Kamran</i>	
Assessment of back-up plan, delay, and waiver options at project gate reviews.....	2-317
<i>Olechowski, Alison; Eppinger, Steven; Joglekar, Nitin</i>	
Challenges for integrating sustainability in risk management – current state of research	2-327
<i>Schulte, Jesko; Hallstedt, Sophie</i>	
An empirical survey on efficiency improvement for the collaboration between design and simulation departments	2-337
<i>Schweigert, Sebastian; Xia, Minghai; Lindemann, Udo</i>	
Process model for data-driven business model generation.....	2-347
<i>Benta, Christian; Wilberg, Julian; Hollauer, Christoph; Omer, Mayada</i>	

A corpus-led approach on guidelines extraction from design thinking methodologies.....	2-357
<i>Rosa, Maiara; Nogueira, Giovana; Rozenfeld, Henrique</i>	
Towards a DT mindset tool evaluation: factors identification from theory and practice.....	2-367
<i>Paparo, Marco; Dosi, Clio; Vignoli, Matteo</i>	
Lean assessment and transformation strategies in product development: a longitudinal study	2-377
<i>Welo, Torgeir; Ringen, Geir</i>	
The coexistence of design thinking and stage and gate in the same organisational context – Challenges and need for integration	2-387
<i>Franchini, Giulia; Dosi, Clio; Vignoli, Matteo</i>	
Large-scale engineering prototyping - Approaching complex engineering problems CERN-style	2-397
<i>Gerstenberg, Achim; Steinert, Martin</i>	
Fitting squares into round holes: Enabling innovation, creativity, and entrepreneurship through corporate Fab Labs	2-407
<i>Fuller, Matt</i>	
Improving exploration capability by interacting with start-ups.....	2-417
<i>Buck, Lennart Sebastian; Nilsson, Susanne; Ritzén, Sofia</i>	
Proposition of a tools selection method to support and favour innovation for a manufacturing company.....	2-427
<i>Lacom, Pauline; Bazzaro, Florence; Sagot, Jean-Claude</i>	
Introduction to operations architecture for complexity management in product design and operations.....	2-437
<i>Oh, Kwansuk; Kim, Daeyoung; Hong, Yoo S.</i>	
Innovation processes in SMEs: Exploring the influence of varying degrees of control	2-447
<i>Karlsson, Anna; Öhrwall Rönnbäck, Anna; Lind, Erika</i>	
Applying multiple metrics in the performance measurement of design sessions in industry: a co-design case study.....	2-457
<i>Mombeshora, Mandy; Dekoninck, Elies; O'Hare, Jamie; Boujut, Jean-François; Cascini, Gaetano</i>	
Design thinking vs. systems thinking for engineering design: What's the difference?	2-467
<i>Greene, Melissa; Gonzalez, Richard; Papalambros, Panos; McGowan, Anna-Maria</i>	
Breakthrough technologies: principle feasibility debates	2-477
<i>Hein, Andreas Makoto; Jankovic, Marija; Condat, Hélène</i>	
Towards an assessment of resilience in telecom infrastructure projects using real options	2-487
<i>Mak, Jonathan; Cassidy, Steve; Clarkson, P. John</i>	
Modeling decisions in complex projects.....	2-497
<i>Siyam, Ghadir; Robinson, Robert Wilson; Kilpinen, Malia</i>	

TABLE OF CONTENTS

Volume 3: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Product, Services and Systems Design

Methodology for the contextual design of a modular product platform concept.....	3-1
<i>Schuh, Günther; Riesener, Michael; Barg, Sebastian; Lauf, Hendrik</i>	
Using point cloud technology for process simulation in the context of digital factory based on a systems engineering integrated approach	3-11
<i>Salehi, Vahid; Wang, Shirui</i>	
Assessing the financial potential for modularization: A case study in a global OEM	3-21
<i>Løkkegaard, Martin; Mortensen, Niels Henrik</i>	
Engineering value-effective healthcare solutions: A systems design perspective.....	3-31
<i>Patou, François; Maier, Anja</i>	
A multimethodology for hospital process redesign.....	3-41
<i>Lamé, Guillaume; Stal-Le Cardinal, Julie; Jouini, Oualid; Carvalho, Muriel; Tournigand, Christophe; Wolkenstein, Pierre</i>	
Integration of MBSE into existing development processes - Expectations and challenges	3-51
<i>Kößler, Johannes; Paetzold, Kristin</i>	
Lightweight visualization of SysML models in PDM systems	3-61
<i>Nigischer, Christian; Gerhard, Detlef</i>	
On the interplay between platform concept development and production maintenance.....	3-71
<i>Bokrantz, Jon; Landahl, Jonas; Levandowski, Christoffer; Skoogh, Anders; Johannesson, Hans; Isaksson, Ola</i>	
Integrating product development models and “in-product models”	3-81
<i>Aßmann, Gert; Stetter, Ralf</i>	
Framing key concepts to design a human centered urban mobility system	3-91
<i>Al Maghraoui, Ouail; Vallet, Flore; Puchinger, Jakob; Yannou, Bernard</i>	
An approach for holistic model-based engineering of industrial plants	3-101
<i>Hooshmand, Yousef; Adamenko, Dmytro; Kunnen, Steffen; Köhler, Peter</i>	
A CBR approach for supporting ecodesign with SysML	3-111
<i>Bougain, Sébastien Joël; Gerhard, Detlef</i>	
Directives to support the design of changeable (I)PSS.....	3-121
<i>Pessôa, Marcus Vinicius Pereira; Becker, Juan Manuel Jauregui</i>	
Assessment of modular platform potential in complex product portfolios of manufacturing companies	3-131
<i>Ortlieb, Casimir; Runge, Tim</i>	
Good product line architecture design principles	3-141
<i>Mortensen, Niels Henrik; Løkkegaard, Martin</i>	
Towards an impact model of modular product structures.....	3-151
<i>Hackl, Jennifer; Krause, Dieter</i>	
Extending system design tools to incorporate user- and contextual elements in developing future products and services.....	3-161
<i>Liem, André</i>	
Sensing behaviour in healthcare design	3-171
<i>Thorpe, Julia Rosemary; Forchhammer, Birgitte Hysse; Maier, Anja</i>	

Nurse-centred design: homecare nursing workarounds to fit resources and treat wounds.....	3-181
<i>Al-Masslawi, Dawood; Fels, Sidney; Lea, Rodger; Currie, Leanne M.</i>	
Supporting design platforms by identifying flexible modules	3-191
<i>Raudberget, Dag S.; Levandowski, Christoffer; André, Samuel; Isaksson, Ola; Elgh, Fredrik; Müller, Jakob; Johansson, Joel; Stolt, Roland</i>	
Trends, observations and drivers for change in systems engineering design	3-201
<i>Isaksson, Ola; Arnarsson, Ívar; Bergsjö, Dag; Catic, Amer; Gustafsson, Göran; Kaya, Onur; Landahl, Jonas; Levandowski, Christoffer; Malmqvist, Johan; Müller, Jakob; Raja, Visakha; Raudberget, Dag S.; Stenholm, Daniel; Ström, Mikael</i>	
Design prototyping of systems	3-211
<i>Camburn, Bradley Adam; Arlitt, Ryan; Perez, K. Blake; Anderson, David; Choo, Pui Kun; Lim, Terry; Gilmour, Adam; Wood, Kristin</i>	
Improving product configurability in ETO companies.....	3-221
<i>Markworth Johnsen, Sara Helene; Kristjansdottir, Katrin; Hvam, Lars</i>	
Service design for people with disabilities using context-based activity modelling and international classification of functioning, disability and health.....	3-231
<i>Lim, Myung Joon; Kim, Yong Se</i>	
Cost based design of modular product families using the example of test rigs.....	3-241
<i>Hanna, Michael; Ripperda, Sebastian; Krause, Dieter</i>	
Mechatronic modularization of intelligent technical systems	3-251
<i>Lipsmeier, Andre; Westermann, Thorsten; Anacker, Harald; Dumitrescu, Roman</i>	
Integrated process and data model for applying scenario-technique in requirements engineering	3-261
<i>Graessler, Iris; Scholle, Philipp; Pottebaum, Jens</i>	
Efficient application of MBSE using reference models: a PGE case study	3-271
<i>Müller, Marvin; Schiffbänker, Paul; Albers, Albert; Braun, Andreas; Bursac, Nikola</i>	
Model based systems engineering (MBSE) approach for configurable product use-case scenarios in virtual environments.....	3-281
<i>Mahboob, Atif; Weber, Christian; Husung, Stephan; Liebal, Andreas; Krömker, Heidi</i>	
"Elderpersonas" adapting personas to understand the real needs of elderly people	3-291
<i>Gonzalez de Heredia, Arantxa; Justel, Daniel; Iriarte, Ion; Lasa, Ganix</i>	
Using TRLs and system architecture to estimate technology integration risk	3-301
<i>Garg, Tushar; Eppinger, Steven; Joglekar, Nitin; Olechowski, Alison</i>	
Estimating the impact of systems engineers on systems design processes.....	3-311
<i>Collopy, Arianne; Greene, Melissa; Adar, Eytan; Papalambros, Panos</i>	
Towards a digital twin: How the blockchain can foster E/E-traceability in consideration of model-based systems engineering	3-321
<i>Heber, Dominik; Groll, Marco</i>	
An engineering approach to mapping meanings in products and services	3-331
<i>Waltersdorfer, Gregor; Gericke, Kilian; Desmet, Pieter; Blessing, Lucienne</i>	
Coping with the challenges of engineering smart product service systems - Demands for research infrastructure	3-341
<i>Kuhlenkötter, Bernd; Bender, Beate; Wilkens, Uta; Abramovici, Michael; Göbel, Jens Christian; Herzog, Michael; Hypki, Alfred; Lenkenhoff, Kay</i>	
Engineering design research methodologies in product-service systems: When the complex gets tough.....	3-351
<i>Ericson, Åsa; Lugnet, Johan; Wenngren, Johan</i>	

Design opportunities in mutual support service for the elderly	3-359
<i>Pahk, Yoonhee; Baek, Joon Sang</i>	
15 industry cases of product-service systems for manufacturing companies and their comparison framework.....	3-369
<i>Kim, Yong Se; Choe, Yunhwa</i>	
mecPro ² - A holistic concept for the model-based development of cybertronic systems.....	3-379
<i>Eigner, Martin; Dickopf, Thomas; Schneider, Marc; Schulte, Tim</i>	
Modeling the relationship between aviation original equipment manufacturers and maintenance, repair and overhaul enterprises from a product-service system perspective	3-389
<i>Goncalves, Cassio; Kokkolaras, Michael</i>	
Designing mental health delivery systems: Where do we start?	3-399
<i>Komashie, Alexander; Ray, Sarah; Kar Ray, Manaan; Clarkson, P. John</i>	
Variant management toolbox.....	3-409
<i>Braun, Thomas; Strattner, Martin</i>	
Design principles of wearables systems: an IoT approach	3-417
<i>Stelvaga, Anastasia; Fortin, Clement</i>	

TABLE OF CONTENTS

Volume 4: Proceedings of the 21st International Conference on Engineering Design (ICED17)	
Design Methods and Tools	
Towards Agile Product Development - The Role of Prototyping	4-1
<i>Böhmer, Annette Isabel; Hostettler, Rafael; Richter, Christoph; Lindemann, Udo; Conradt, Jörg; Knoll, Alois</i>	
The Analogy Retriever – an idea generation tool	4-11
<i>Han, Ji; Shi, Feng; Chen, Liuqing; Childs, Peter R. N.</i>	
Identifying variability key characteristics for automation design - A case study of finishing process.....	4-21
<i>Sanchez-Salas, Angel; Goh, Yee Mey; Case, Keith</i>	
Assessment of dependencies in mechatronics conceptual design of a quadcopter drone using linguistic fuzzy variables	4-31
<i>Chouinard, Ugo; Achiche, Sofiane; Leblond-Ménard, Cédric; Baron, Luc</i>	
Design guidelines for shoulder design of an anthropomorphic robotic arm	4-41
<i>Leroux, Martin; Achiche, Sofiane; Beaini, Dominique; Raison, Maxime</i>	
Biomimicry design tooling.....	4-51
<i>Stevens, Laura; de Vries, Marc; van den Broek, Jos; Rijken, Dick</i>	
An approach to handle uncertainty during the process of product modelling	4-59
<i>Würtenberger, Jan; Lotz, Julian; Freund, Tillmann; Kirchner, Eckhard</i>	
Assessment of changes in engineering design using change propagation cost analysis.....	4-69
<i>Rebentisch, Eric; Schuh, Günther; Riesener, Michael; Breunig, Stefan; Hoensbroech, Ferdinand</i>	
A method for the tolerance analysis of bearing seats for cylindrical roller bearings in respect to operating clearance and fatigue life.....	4-79
<i>Aschenbrenner, Alexander; Wartzack, Sandro</i>	
Exploring the persona model as a tool to generate user insight through co-creation with users in the early phase of a design project.....	4-89
<i>Hansen, Jane Holm; Nielsen, Louise Møller</i>	
Nonlinear quality function deployment: An experimental analysis	4-99
<i>Bertoni, Marco; Bertoni, Alessandro</i>	
The role of multidisciplinary design optimization (MDO) in the development process of complex engineering products	4-109
<i>Papageorgiou, Athanasios; Ölvander, Johan</i>	
Knowledge management and eco-innovation: Issues and organizational challenges to small and medium enterprises	4-119
<i>Cherifi, Ahmed; Gardoni, Mickaël; M'Bassègue, Patrick; Renaud, Jean; Houssin, Rémy</i>	
The agile toolbox - Adaptation of agileMPPs to the mechatronic development process	4-129
<i>Goevert, Kristin; Baumgartner, Michael; Lindemann, Udo</i>	
Automotive styling: Supporting engineering-styling convergence through surface-centric knowledge based engineering.....	4-139
<i>Feldinger, Ulrich Ernst; Kleemann, Sebastian; Vietor, Thomas</i>	
Design for Control	4-149
<i>Stetter, Ralf; Simundsson, Avery</i>	
Design procedures in the development of an electromagnetic manipulator.....	4-159
<i>Al Mashagbeh, Mohammad; Al-Dulaimi, Thamir; Khamesee, Mir Behrad</i>	

A rapid algorithm for multi-objective Pareto optimization of modular architecture	4-169
<i>Sanaei, Roozbeh; Otto, Kevin; Wood, Kristin; Hölttä-Otto, Katja</i>	
Designing new concepts for household appliance with the help of TRIZ.....	4-179
<i>Baur, Christoph; Muenzberg, Christopher; Lindemann, Udo</i>	
Derivation, analysis and comparison of geometric requirements for various vehicle drivetrains using dimensional chains.....	4-189
<i>Felgenhauer, Matthias; Schöpe, Frank; Bayerlein, Michaela; Lienkamp, Markus</i>	
Agile development and the constraints of physicality: A network theory-based cause-and-effect analysis	4-199
<i>Schmidt, Tobias Sebastian; Chahin, Abdo; Kößler, Johannes; Paetzold, Kristin</i>	
Empirical study of ill-supported activities in variation risk identification and assessment in early stage product development.....	4-209
<i>Bjarklev, Kristian; Mortensen, Niels Henrik; Ebro, Martin</i>	
Towards non-hierarchical system descriptions for automating functional analysis	4-219
<i>Amrin, Andas; Spitas, Christos</i>	
Matrix-based system modelling to predict properties change propagation	4-229
<i>Luedke, Tobias; Kaspar, Jerome; Meiser, Philip; Schneberger, Jan-Henrik; Herrmann, Hans-Georg; Vielhaber, Michael</i>	
A function- and embodiment-based failure analysis method for an in-depth understanding of failure mechanisms	4-239
<i>Gladysz, Bartosz; Spandl, Lukas; Albers, Albert</i>	
Predicting and visualizing cost propagation due to engineering design changes	4-249
<i>Georgiades, Alex; Sharma, Sanjiv; Kipouros, Timoleon; Savill, Mark</i>	
OSLC based approach for product appearance structuring.....	4-259
<i>Ebeling, René; Eigner, Martin</i>	
Identifying affordances from online product reviews.....	4-267
<i>Hou, Tianjun; Yannou, Bernard; Leroy, Yann; Poirson, Emilie; Mata, Ivan; Fadel, Georges</i>	
Design for robustness - Systematic application of design guidelines to control uncertainty.....	4-277
<i>Freund, Tillmann; Würtenberger, Jan; Lotz, Julian; Rommel, Carmen; Kirchner, Eckhard</i>	
Prototyping shape-changing interfaces – An evaluation of living hinges' abilities to resemble organic, shape-changing interfaces	4-287
<i>Jensen, Matilde Bisballe; Blindheim, Jørgen; Steinert, Martin</i>	
Evolving LEGO: Prototyping requirements for a customizable construction kit	4-297
<i>Boa, Duncan; Mathias, David; Hicks, Ben</i>	
Designing the missing link between science and industry: Organizing partnership based on dual generativity.....	4-307
<i>Klasing Chen, Milena; Aknin, Patrice; Lagadec, Lilly-Rose; Laousse, Dominique; Le Masson, Pascal; Weil, Benoît</i>	
Enhanced integrated sensitivity analysis in model based QFD method.....	4-317
<i>Shabestari, Seyed Sina; Bender, Beate</i>	
Evaluation and management of customer feedback to include market dynamics into product development: Satisfaction Importance Evaluation (SIE) model.....	4-327
<i>Gupta, Ravi Kumar; Belkadi, Farouk; Bernard, Alain</i>	
Meta-model for VR-based design reviews	4-337
<i>Gebert, Martin; Steger, Wolfgang; Stelzer, Ralph; Bertelmann, Kathrin</i>	
Use case based methodology for conceptual design of industrial mechatronic products	4-347
<i>Scalice, Régis Kovacs; Berkenbrock, Gian Ricardo; Mendoza, Yesid Ernesto Asaff</i>	

An automated generation method of system architecture with component's multi-criterion evaluation	4-357
<i>Chen, Ruirui; Liu, Yusheng; Liu, Ying; Zhang, Zhinan; Ye, Xiaoping; Hu, Jie</i>	
Extended target weighing approach - Identification of lightweight design potential for new product generations.....	4-367
<i>Albers, Albert; Revfi, Sven; Spadinger, Markus</i>	
An optimization-based approach for supporting early product architecture decisions	4-377
<i>Raja, Visakha; Isaksson, Ola; Kokkolaras, Michael</i>	
Integrated modeling of behavior and reliability in system development.....	4-385
<i>Hentze, Julian; Kaul, Thorben; Graessler, Iris; Sextro, Walter</i>	
Applying robust design methodology to a quadrotor drone	4-395
<i>Coulombe, Charles; Gamache, Jean-Francois; Mohebbi, Abolfazl; Chouinard, Ugo; Achiche, Sofiane</i>	
A network-based approach to identify lacking coordination using higher order links	4-405
<i>Weidmann, Dominik; Becerril, Lucia; Hollauer, Christoph; Kattner, Niklas; Lindemann, Udo</i>	
A crowdsourced design experiment using free-hand sketch design method based on the cDesign framework	4-415
<i>Wu, Hao; Corney, Jonathan</i>	
Using the ACD ³ -ladder to manage multi-phase requirements on end-user products.....	4-425
<i>Berlin, Cecilia; Bligård, Lars-Ola; Simonsen, Eva</i>	
Approaches to increasing method acceptance in agile product development processes	4-435
<i>Reiß, Nicolas; Albers, Albert; Bursac, Nikola</i>	
An approach to analyse the potential of tailored forming by TRIZ Reverse	4-445
<i>Brockmöller, Tim; Mozgova, Iryna; Lachmayer, Roland</i>	
Exploring the integration of social media feedback for user-oriented product development.....	4-453
<i>Deng, Quan; Franke, Marco; Hribernik, Karl; Thoben, Klaus-Dieter</i>	
From customer experience to product design: Reasons to introduce a holistic design approach.....	4-463
<i>Ceccacci, Silvia; Giraldi, Luca; Mengoni, Maura</i>	
User-driven segmentation of design data	4-473
<i>Maynard, Alex; Burnap, Alexander; Papalambros, Panos</i>	
User experience journeys	4-483
<i>Kremer, Simon; Krahl, Thilo; Lindemann, Udo</i>	
Generic generative design systems to imprint personalities in consumer products: Preliminary results	4-493
<i>Beghelli, Alejandra; Briede, Juan; Carrasco, Miguel; Prieto, Pablo</i>	
From simulation to inventive problem resolution, a global method	4-503
<i>Dubois, Sébastien; De Guio, Roland; Rasovska, Ivana; Ben Moussa, Fatima Zahra; Benmoussa, Rachid</i>	
Value-driven simulation: Thinking together through simulation in early engineering design	4-513
<i>Panarotto, Massimo; Wall, Johan; Bertoni, Marco; Larsson, Tobias; Jonsson, Pontus</i>	
The application of quality functional deployment to modular offsite construction products.....	4-523
<i>Wee, Tanawan Pang Yew; Aurisicchio, Marco; Starzyk, Ireneusz</i>	
Categorizing user pains, usage situations and existing solutions in front end of innovation: The case of smart lighting project.....	4-533
<i>Bekhradi, Alexandre; Yannou, Bernard; Cluzel, François; Vallette, Thomas</i>	
Do biomimetic students think outside the box?	4-543
<i>Lenau, Torben Anker</i>	

Does prototype format influence stakeholder design input?	4-553
<i>Deininger, Michael; Daly, Shanna; Sienko, Kathleen; Lee, Jennifer; Obed, Samuel; Effah Kaufmann, Elsie</i>	
Employing design representations for user-feedback in the product design lifecycle	4-563
<i>Ray, Samantak; Choi, Young Mi</i>	
Simulation of acoustic product properties in virtual environments based on artificial neural networks (ANN).....	4-573
<i>Siegel, Antje; Weber, Christian; Albers, Albert; Landes, David; Behrendt, Matthias</i>	
Design for relaxation: A model for understanding stress for designers	4-583
<i>Stoop, Michèle; Snelders, Dirk</i>	
A computational tool for virtual product development exploiting changeability knowledge	4-593
<i>Francalanza, Emmanuel; Borg, Jonathan; Constantinescu, Carmen</i>	
Detection and splitting of constructs of SAPPhIRE model to support automatic structuring of analogies	4-603
<i>Keshwani, Sonal; Chakrabarti, Amaresh</i>	
Change propagation management by active batching	4-613
<i>Oh, Gyesik; Hong, Yoo S.</i>	
Integrated structure-control design optimization of an unmanned quadrotor helicopter (UGH) for object grasping and manipulation	4-623
<i>Mohebbi, Abolfazl; Gallacher, Colin; Harrison, James; Willes, John; Achiche, Sofiane</i>	
A method for the expert-based identification of engineering change propagation.....	4-633
<i>Kattner, Niklas; Mehlstäubl, Jan; Becerril, Lucia; Hollauer, Christoph; Weidmann, Dominik; Lindemann, Udo</i>	
Bridging the semantic gap in customer needs elicitation: a machine learning perspective.....	4-643
<i>Wang, Yue; Zhang, Jian</i>	
Advanced innovation design approach for process engineering.....	4-653
<i>Casner, Didier; Livotov, Pavel</i>	
Expert based approach to analyse and influence indirect cost of engineering changes	4-663
<i>Schmied, Christian; Gebhardt, Marcel; Mörtl, Markus; Lindemann, Udo</i>	
Process integrated product concretisation: Extending conceptual design with function focus by processual product design	4-673
<i>Mattmann, Ilyas; Kloberdanz, Hermann; Kirchner, Eckhard</i>	
Decentralized handling of conflicts in multi-brand engineering change management.....	4-683
<i>Hesselmann, Carsten; Kehl, Stefan; Stiefel, Patrick; Müller, Jörg</i>	
Need network analysis: A process to understand the stakeholder need structure in multi-actor service systems.....	4-693
<i>Pahk, Yoonhee; Baek, Joon Sang</i>	
A geometric approach to tolerance analysis: Contribution to the robust design of flexible assemblies.....	4-703
<i>Schluer, Christoph; Gust, Peter; Mersch, Frank; Diepschlag, Falko; Sersch, Alina</i>	
On the relationship between affordance and expected performance	4-711
<i>De Benetti, Nicolo; Fantoni, Gualtiero; Chiarello, Filippo; Bonaccorsi, Andrea; Fadel, Georges; Mata, Ivan</i>	
Predicting indirect process costs of engineering change based on a task characteristic perspective	4-721
<i>Gebhardt, Marcel</i>	

TABLE OF CONTENTS

Volume 5: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Design for X, Design to X

A design method for restriction oriented lightweight design by using selective laser melting	5-1
<i>Lippert, Bastian; Lachmayer, Roland</i>	
Implementation of lightweight design in the product development process of unmanned aerial vehicles	5-11
<i>Junk, Stefan; Schröder, Werner; Hangst, Nikolai</i>	
Value chains and digitization of product development processes	5-21
<i>Meussen, Bernhard</i>	
Realisation of self-replicating production resources through tight coupling of manufacturing technologies	5-31
<i>Goudswaard, Mark; Hicks, Ben; Nassehi, Aydin; Mathias, David</i>	
A methodical approach to support ideation for additive manufacturing in design education.....	5-41
<i>Watschke, Hagen; Bavendiek, Ann-Kathrin; Giannakos, Alexander; Vietor, Thomas</i>	
An approach to implement design for additive manufacturing in engineering studies	5-51
<i>Lippert, Bastian; Leuteritz, Georg; Lachmayer, Roland</i>	
Product sustainability assessment in conceptualisation phase	5-61
<i>Martinez, Victor Gerardo</i>	
Increasing product attachment through personalised design of additively manufactured products.....	5-71
<i>Campbell, Robert Ian; Bernabei, Roberta</i>	
New ways of hygienic design – A methodical approach.....	5-81
<i>Beetz, Jean-Paul; Kloberdanz, Hermann; Kirchner, Eckhard</i>	
Design heuristics for additive manufacturing.....	5-91
<i>Blösch-Paidosh, Alexandra; Shea, Kristina</i>	
Using additive manufacturing to design adaptive user interfaces – Lessons learned from a DfAM process.....	5-101
<i>Weiss, Florian; Janny, Benedikt; Binz, Hansgeorg; Maier, Thomas; Roth, Daniel</i>	
Why choose one sustainable design strategy over another: A decision-support prototype	5-111
<i>Gould, Rachael; Lagun Mesquita, Patricia; Bratt, Cecilia; Broman, Göran</i>	
Systematic approach to optimize cost drivers based on life cycle cost modeling.....	5-121
<i>Johannknecht, Florian; Gatzen, Matthias; Lachmayer, Roland</i>	
An assembly-oriented product design methodology to develop similar assembly operations in a mixed-product assembly line	5-131
<i>Asadi, Narges; Jackson, Mats; Augustsson, Per; Fundin, Anders</i>	
Additive repair design approach: Case study to repair aluminium base components.....	5-141
<i>Zghair, Yousif Amsad; Lachmayer, Roland</i>	
Towards real-time feedback on manufacturability for engineering designers directly from manufacturers	5-151
<i>Weißbach, Paul; Gerhard, Detlef</i>	
Complexity theory as an epistemological approach to sustainability assessment methods definition	5-159
<i>Nigra, Marianna</i>	
Cyber-physical effects on the virtual commissioning architecture	5-169
<i>Illmer, Benjamin; Kaspar, Jerome; Vielhaber, Michael</i>	

Design challenges in energy conservation strategies for shared spaces.....	5-179
<i>Withanage, Chathura; Blessing, Lucienne; Wood, Kristin</i>	
Is it sustainable? A conceptual exposition of sustainability in technical artefacts	5-189
<i>Hay, Laura; Duffy, Alex</i>	
An end of life oriented framework to support the transition toward circular economy	5-199
<i>Marconi, Marco; Germani, Michele</i>	
Life cycle development - A closer look at strategies and challenges for integrated life cycle planning and upgrading of complex systems	5-209
<i>Cudok, Anja; Huth, Tobias; Inkermann, David; Vietor, Thomas</i>	
Democratisation of design for functional objects manufactured by fused deposition modelling (FDM): Lessons from the design of three everyday artefacts.....	5-219
<i>Goudswaard, Mark; Hicks, Ben; Gopsill, James; Nassehi, Aydin</i>	
Sustainability integration in a technology readiness assessment framework	5-229
<i>Hallstedt, Sophie; Pigosso, Daniela</i>	
Design for privacy in public space	5-239
<i>Cho, Kwangmin; Kim, Chajoong</i>	
Performance monitoring and control for an additive manufacturing factory - A case study in the aerospace industry.....	5-249
<i>Judalet, Nicolas; Kazakçı, Akin; Le Gougeuc, Emmanuel; Balvay, Arnaud</i>	
Assessing the performance of additive manufacturing applications	5-259
<i>Türk, Daniel-Alexander; Fontana, Filippo; Rüegg, Fabian; Gill, Rajan Joshua; Meboldt, Mirko</i>	
Future-adaptability for energy and resource efficient vehicles.....	5-269
<i>Nyström, Thomas; Svengren Holm, Lisbeth; van Loon, Patricia</i>	
Fundamental challenges in developing Internet of Things applications for engineers and product designers.....	5-279
<i>Heinis, Timon; Gomes Martinho, Carlos; Meboldt, Mirko</i>	
Codesign of sustainable performance objectives in a food value chain.....	5-289
<i>Petit, Gaëlle; Yannou-Le Bris, Gwenola; Trystram, Gilles</i>	
How can design science contribute to a circular economy?.....	5-299
<i>Pigosso, Daniela; McAloone, Tim</i>	
The need for effective design guides in additive manufacturing.....	5-309
<i>Seepersad, Carolyn Conner; Allison, Jared; Sharpe, Conner</i>	
From privacy by design to design for privacy	5-317
<i>Rostama, Guilda; Bekhradi, Alexandre; Yannou, Bernard</i>	
A framework for designing end use products for direct manufacturing using additive manufacturing technologies.....	5-327
<i>Zhu, Zicheng; Pradel, Patrick; Bibb, Richard; Moultrie, James</i>	
A new method for designing porous implant	5-337
<i>Yang, Huiyuan; Zhao, Yaoyao</i>	
Additive manufacturing and the product development process: Insights from the space industry	5-345
<i>Lindwall, Angelica; Dordlofva, Christo; Öhrwall Rönnbäck, Anna</i>	
A review of key dimensions for designing environment-driven collaboration practices with external business partners....	5-355
<i>Stewart, Raphaëlle; Boks, Casper; Bey, Niki</i>	
A design to cost method for electric cable harness.....	5-365
<i>Mandolini, Marco; Cicconi, Paolo; Castorani, Vincenzo; Vita, Alessio; Germani, Michele</i>	

Interdisciplinary life cycle data analysis within a knowledge-based system for product cost estimation	5-375
<i>Altavilla, Stefania; Montagna, Francesca; Newnes, Linda</i>	
An exploration of company personas to support customized DfS implementation	5-385
<i>Ali, Faheem; Boks, Casper; Bey, Niki</i>	
Towards a top-down design methodology for 4D printing	5-395
<i>Sossou, Germain; Demoly, Frédéric; Montavon, Ghislain; Gomes, Samuel</i>	

TABLE OF CONTENTS

Volume 6: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Design Information and Knowledge

Knowledge based support for the designer at the interface of CAD/CAE.....	6-1
<i>Andrae, Rene; Köhler, Peter</i>	
Towards robust inter-organizational synergy: Perceived quality knowledge transfer in the automotive industry.....	6-11
<i>Stenholm, Daniel; Styliidis, Konstantinos; Bergsjö, Dag; Söderberg, Rikard</i>	
Concept for a simulation model to analyze knowledge conversions within the product development process.....	6-21
<i>Laukemann, Alexander; Binz, Hansgeorg; Roth, Daniel</i>	
Automatic design structure matrices: A comparison of two formula student projects	6-31
<i>Gopsill, James; Snider, Chris; Emanuel, Lia; Joel-Edgar, Sian; Hicks, Ben</i>	
Improving engineering information retrieval by combining TD-IDF and product structure classification	6-41
<i>Jones, David; Matthews, Jason; Xie, Yifan; Gopsill, James; Dotter, Martin; Chanchevrier, Nicolas; Hicks, Ben</i>	
Development of a knowledge-based system for help in decision making: A medical application	6-51
<i>Coton, Justine; Thomann, Guillaume; Villeneuve, François</i>	
Design space visualization for efficiency in knowledge discovery leading to an informed decision	6-61
<i>Abi Akle, Audrey; Yannou, Bernard; Minel, Stéphanie</i>	
A clustering and word similarity based approach for identifying product feature words.....	6-71
<i>Suryadi, Dedy; Kim, Harrison</i>	
Framework of mechanical design knowledge representations for avoiding patent infringement	6-81
<i>Jiang, Pingfei; Atherton, Mark; Harrison, David; Malizia, Alessio</i>	
Technical inheritance: Information basis for the identification and development of product generations	6-91
<i>Mozgova, Iryna; Barton, Sebastian; Demminger, Christian; Miebach, Timo; Taptimthong, Piriya; Lachmayer, Roland; Nyhuis, Peter; Reimche, Wilfried; Wurz, Marc Christopher</i>	
Product description in terms of advantages and drawbacks: Exploiting patent information in novel ways	6-101
<i>Chiarello, Filippo; Fantoni, Gualtiero; Bonaccorsi, Andrea</i>	
The knowledge benchmarking process framework: A new basis to analyze megaprojects challenges and practices.....	6-111
<i>Mbassegue, Patrick; Gardoni, Mickaël; Tahboub, Zain</i>	
Supporting development teams in the early stages of product development through DfX-based knowledge management system and communication platform.....	6-121
<i>Ugurlu, Sinan; Gerhard, Detlef</i>	
Knowledge-based engineering applications for supporting the design of precast concrete facade panels	6-131
<i>Montali, Jacopo; Overend, Mauro; Pelken, P. Michael; Sauchelli, Michele</i>	
From elicitation to structuring of additive manufacturing knowledge	6-141
<i>Grandvallet, Christelle; Pourroy, Franck; Prudhomme, Guy; Vignat, Frédéric</i>	
k-MORE - A methodology to manage documented knowledge for reuse.....	6-151
<i>Carro Saavedra, Cristina; Lindemann, Udo</i>	
The difficulties reported by engineers in searching information	6-161
<i>Zhang, Shuai; Johnson, Aylmer</i>	
Gathering and analysing external influences on the product design - a case study.....	6-169
<i>Kammerl, Daniel; Echle, Stefan; Mörtl, Markus</i>	

Mediating constraints across design and manufacturing using platform-based manufacturing operations.....	6-179
<i>Landahl, Jonas; Madrid, Julia; Levandowski, Christoffer; Johannesson, Hans; Söderberg, Rikard; Isaksson, Ola</i>	
A new knowledge management tool for product development in micro-companies	6-189
<i>Huret, Martin; Jean, Camille; Segonds, Frédéric</i>	
Functional surfaces as initial product design concept in 3D-CAD-Systems	6-197
<i>Katzwinkel, Tim; Jacobs, Georg; Löwer, Manuel; Schmid, Alexander; Schmidt, Walter; Siebrecht, Justus</i>	
A new "knowledge-based engineering" guideline	6-207
<i>Luft, Thomas; Roth, Daniel; Binz, Hansgeorg; Wartzack, Sandro</i>	
Structuring information in technical inheritance with PDM systems.....	6-217
<i>Scheidel, Wieben; Mozgova, Iryna; Lachmayer, Roland</i>	
Modularization: Exploring opportunities for knowledge transfer between the mechanical engineering and construction industry.....	6-227
<i>Kohl, Markus; Wilberg, Julian; Tommelein, Iris; Pikas, Ergo; Lindemann, Udo</i>	
Maturity of models in a multi-model decision support system.....	6-237
<i>Johansson, Christian; Wall, Johan; Panarotto, Massimo</i>	
Lessons learnt from experts in design rationale knowledge capture.....	6-247
<i>Hall, Mark; Bermell-Garcia, Pablo; Ravindranath, Ranjit; McMahon, Christopher</i>	
Improved codification and transfer of engineering knowledge through human intermediaries	6-257
<i>Ruck, Tobias; Albers, Albert; Reiß, Nicolas</i>	
Support management of product families and the corresponding automation systems – A method to capture and share design rationale	6-267
<i>Poorkiany, Morteza; Johansson, Joel; Elgh, Fredrik</i>	
Climbing C-trees: Analysing Concept-tree content and construction	6-277
<i>Blanco, Eric; Le Dain, Marie-Anne; Lavayssiere, Pierre; Chevrier, Pierre</i>	
Information rich mapping requirement to product architecture through functional system deployment: The Multi Entity Domain Approach.....	6-287
<i>Hauksdóttir, Dagný; Mortensen, Niels Henrik</i>	
Information extracted from patents as creative stimuli for product innovation	6-297
<i>Parvin, Mehdi; Cascini, Gaetano; Becattini, Niccolo</i>	
A visual analysis of technical knowledge evolution based on patent data	6-307
<i>Smojver, Vladimir; Potočki, Eva; Štorga, Mario</i>	
Modeling product co-consideration relations: A comparative study of two network models.....	6-317
<i>Sha, Zhenghui; Wang, Mingxian; Huang, Yun; Contractor, Noshir; Fu, Yan; Chen, Wei</i>	
Utilizing unstructured feedback data from MRO reports for the continuous improvement of standard products.....	6-327
<i>Abramovici, Michael; Gebus, Philip; Göbel, Jens Christian; Savarino, Philipp</i>	
How explicit are we in a design meeting: Investigation on meeting knowledge structuring with design rationale	6-337
<i>Dai, Xinghang; Velde, Frank</i>	
Framework of the evolution in virtual product modelling and model management towards digitized engineering.....	6-345
<i>Bitzer, Michael; Eigner, Martin; Fajßt, Karl-Gerhard; Muggeo, Christian; Eickhoff, Thomas</i>	
Definition and support of differentiation and integration in mechanical structure using S-curve theory and wavelet transform	6-355
<i>Ishii, Takahiro; Parque, Victor; Miura, Satoshi; Miyashita, Tomoyuki</i>	

TABLE OF CONTENTS

Volume 7: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Design Theory and Research Methodology

A method for systematic elaboration of research phenomena in design research.....	7-1
<i>Horvath, Imre</i>	
The PSI matrix – A framework and a theory of design.....	7-11
<i>Reich, Yoram; Subrahmanian, Eswaran</i>	
Mining data to design value: A demonstrator in early design	7-21
<i>Bertoni, Alessandro; Larsson, Tobias; Larsson, Jonas; Elfsberg, Jenny</i>	
The development of a novel standardisation-customisation continuum.....	7-31
<i>Heredia Jiménez, Juan Antonio; Whitfield, Robert Ian; Ward, Michael; Grierson, Hilary</i>	
Data-driven engineering design research: Opportunities using open data.....	7-41
<i>Parraguez, Pedro; Maier, Anja</i>	
Rise and fall of platforms: Systematic analysis of platform dynamics thanks to axiomatic design	7-51
<i>Legrand, Julien; Thomas, Maxime; Le Masson, Pascal; Weil, Benoît</i>	
Studying design abduction in the context of novelty	7-61
<i>Kroll, Ehud; Koskela, Lauri</i>	
Design analytics is the answer, but what questions would product developers like to have answered?	7-71
<i>Arnarsson, Ívar Örn; Gustavsson, Emil; Malmqvist, Johan; Jirstrand, Mats</i>	
Decision design and re-ordering preferences: The case of an exploration project in a large firm	7-81
<i>Le Glatin, Mario; Le Masson, Pascal; Weil, Benoît</i>	
Investigating usage data support in development processes - A case study	7-91
<i>Höhn, Manuel; Hollauer, Christoph; Wilberg, Julian; Kammerl, Daniel; Mörtl, Markus; Omer, Mayada</i>	
What do we need to say about a design method?	7-101
<i>Gericke, Kilian; Eckert, Claudia; Stacey, Martin</i>	
Structure sharing for resource effective solutions: Improving measures to account for importance and quality of functions.....	7-111
<i>Ghazanfari, Ehsan; Singh, Vishal</i>	
Theoretical explanation of “Y-gaya” through general design theory.....	7-121
<i>Oizumi, Kazuya; Aoyama, Kazuhiko</i>	
The beginning of a new era: Using design thinking to identify dimensions for product assessment	7-131
<i>de Paula, Danielly; Menning, Axel; Ewald, Benedikt; Cormican, Kathryn</i>	
A category of design steps	7-141
<i>Breiner, Spencer; Subrahmanian, Eswaran</i>	
Concept for investigating the application of methods in product development.....	7-151
<i>Gust, Peter; Kuhlmeier, Marco; Garbe, Marie; Kampa, Sebastian</i>	
Enhancing the balancing while synthesizing-process - a method development project.....	7-161
<i>Noubarpour, Dennis</i>	
Ekphrasis as a design method.....	7-171
<i>Gero, John</i>	

TABLE OF CONTENTS

Volume 8: Proceedings of the 21st International Conference on Engineering Design (ICED17)	
Human Behaviour in Design	
Evaluating the influences of heterogeneous combinations of internal/external factors on product design	8-1
<i>Filippi, Stefano; Barattin, Daniela</i>	
Studying design fixation with a computer-based task.....	8-11
<i>Neroni, Maria Adriana; Vasconcelos, Luis Arthur; Crilly, Nathan</i>	
Modal shifts in concentration indicate creativity	8-21
<i>Nguyen, Philon; Zeng, Yong</i>	
Similarities and differences between humorous and surprising products	8-31
<i>Borgianni, Yuri; Hatcher, Gillian</i>	
User involvement in pharmaceutical packaging design – A case study	8-41
<i>Lorenzini, Giana Carli; Olsson, Annika; Larsson, Andreas</i>	
Human-centred design blending smart technology with emotional responses: Case study on interactive clothing for couples	8-51
<i>Weizhen, Wang; Nagai, Yukari; Yuan, Fang</i>	
Target based analysis - A model to analyse usability tests based on mobile eye tracking recordings	8-59
<i>Mussgnug, Moritz; Sadowska, Aleksandra; Moryson, Ralf; Meboldt, Mirko</i>	
Multisensory product development.....	8-69
<i>Fels, Antonia; Falk, Björn; Schmitt, Robert</i>	
Necessary extension of conventional idea processes by means of a method for the identification of radical product ideas.....	8-79
<i>Herrmann, Thorsten; Binz, Hansgeorg; Roth, Daniel</i>	
Blow Bits: Creative playgrounds, gamification and virtuosity with hybrid design tools and environments (HDTE)	8-89
<i>Wendrich, Robert</i>	
Design variation through richness of rules embedded in LEGO bricks	8-99
<i>Mathias, David; Boa, Duncan; Hicks, Ben; Snider, Chris; Bennett, Peter; Taylor, Colin</i>	
The emotive qualities of patterns: Insights for design	8-109
<i>Urquhart, Lewis William Robert; Wodehouse, Andrew</i>	
Tool for creating a defined task as preparation for a target-oriented idea generation process.....	8-119
<i>Herrmann, Thorsten; Binz, Hansgeorg; Roth, Daniel</i>	
Taking into account life situation during a co-creativity session: An exploratory study.....	8-129
<i>Lobbé, Justine; Bazzaro, Florence; Charrier, Marjorie; Sagot, Jean-Claude</i>	
Fostering ideation in the very early design phases: How textual, pictorial and combined stimuli affect creativity.....	8-139
<i>Borgianni, Yuri; Rotini, Federico; Tomassini, Marco</i>	
Using embedded design structures to unravel a complex decision in a product development system	8-149
<i>McKay, Alison; Sammonds, George; Ahmed-Kristensen, Saeema; Irnazarow, Aleksandra; Robinson, Mark</i>	
Kansei modeling methodology for multisensory UX design	8-159
<i>Yanagisawa, Hideyoshi; Miyazaki, Chihiro; Bouchard, Carole</i>	
Elements to the development of a creativity technique	8-169
<i>Medeiros Leopoldino, Kleidson; Aguirre González, Mario; de Oliveira Ferreira, Paula; de Melo, David; de Vasconcelos, Rafael</i>	

Design fixation to examples: A study on the time decay of fixation	8-179
<i>Viswanathan, Vimal Kumar</i>	
Building a computational laboratory for the study of team behaviour in product development.....	8-189
<i>Perišić, Marija Majda; Štorga, Mario; Gero, John</i>	
Proposal for a new usability index for product design teams and the general public	8-199
<i>Brandy, Anthony; Mantelet, Fabrice; Aoussat, Améziane; Pigot, Pierre-Vincent</i>	
Calculation of design cognitive features based on complex linkography-network	8-209
<i>Xu, Jiang; Chuai, Ying; Wang, Xiuyue; Sun, Gang</i>	
Types of people in communal development projects in construction sector: Are they effective together?	8-219
<i>Latvala, Marika; Singh, Vishal</i>	
Exploring the decomposition of team design activity.....	8-229
<i>Martinec, Tomislav; Škec, Stanko; Štorga, Mario</i>	
A hand gesture-based interface for design review using leap motion controller	8-239
<i>Xiao, Yu; Peng, Qingjin</i>	
The idea mapping board: A tool for assessing design concepts and visualizing a team's use of the design space	8-249
<i>Helm, Kevin; Henderson, Daniel; Jablokow, Kathryn; Daly, Shanna; Yilmaz, Seda; Silk, Eli; Sevier, Daniel</i>	
Three driven approaches to combinational creativity	8-259
<i>Han, Ji; Park, Dongmyung; Shi, Feng; Chen, Liuqing; Childs, Peter R. N.</i>	
Designing with LEGO: Exploring the influence of low fidelity visualisation on collaborative design activities	8-269
<i>Ranscombe, Charlie; Bissett-Johnson, Katherine; Boa, Duncan; Hicks, Ben</i>	
An exploration of design synthesis	8-279
<i>McTeague, Chris; Duffy, Alex; Campbell, Gerard; Grealy, Madeleine; Hay, Laura; Pidgeon, Laura; Vuletic, Tijana</i>	
Which are the limitations of ICT tools for collaborative design with suppliers?.....	8-289
<i>Talas, Yassine; Gzara, Lilia; Le Dain, Marie-Anne; Merminod, Valéry; Frank, Alejandro Germán</i>	
Investigating the relationship between customer emotions and sportsbike aesthetics	8-299
<i>Mamo, James; Farrugia, Philip; Sant, Tonio</i>	
Investigating effects of stimuli on ideation outcomes.....	8-309
<i>Venkataraman, Srinivasan; Song, Binyang; Luo, Jianxi; Subburaj, Karupppasamy; Elara, Mohan Rajesh; Blessing, Lucienne; Wood, Kristin</i>	
The best of three worlds - The creation of InnoDev a software development approach that integrates Design Thinking, Scrum and Lean Startup	8-319
<i>Dobrigkeit, Franziska; de Paula, Danielly</i>	
Defining the requirement for a direct vision standard for trucks using a DHM based blind spot analysis	8-329
<i>Summerskill, Stephen; Marshall, Russell</i>	
A study on the impact of HOVER platforms on design teams collaborative behaviors during collocated collective early preliminary design activities	8-339
<i>Guerra, Andrea Luigi; Gidel, Thierry; Vezzetti, Enrico</i>	
Interrelations between processes, methods, and tools in collaborative design - A framework.....	8-349
<i>Bavendiek, Ann-Kathrin; Inkermann, David; Vietor, Thomas</i>	
Design of a smart alarm clock to foster sustainable urban mobility	8-359
<i>Monici, Dario; Graziosi, Serena; Ferrise, Francesco; Bordegoni, Monica</i>	

Exploring human behaviour in design education: Supporting sustainable decision-making with a tabletop activity	8-369
<i>Willis, Amanda; Wise, Alyssa; Antle, Alissa</i>	
An objective methodology for blind spot analysis of HGVs using a DHM approach	8-379
<i>Marshall, Russell; Summerskill, Stephen</i>	
Creativity as a way to innovate successfully	8-389
<i>Guenther, Agnes; Eisenbart, Boris; Dong, Andy</i>	
Show me the pictures: The effect of representational modalities on abductive reasoning in decision making	8-399
<i>Arntz, Sarah; Verbaan, Ruben; Eisenbart, Boris; Cardoso, Carlos</i>	
Business game and its relationship with creativity: a systematic literature review	8-409
<i>Rosa, Marcela; González, Mario; Araújo, Ana Cláudia Costa de; Santiago, George</i>	
Designer's identity: Development of personal attributes and design skills over education	8-419
<i>Kunrath, Kamila; Cash, Philip; Li-Ying, Jason</i>	
Material perception and material identification in product design	8-429
<i>Dacleu Ndengue, Jessica; Juganaru-Mathieu, Mihaela; Faucheu, Jenny</i>	
Experiential qualities of science museum exhibits: a thematic analysis	8-439
<i>Ocampo-Agudelo, Jose; Maya, Jorge</i>	
Can visual facilitation beat verbal facilitation?.....	8-449
<i>Boedhoe, Roché; Badke-Schaub, Petra</i>	
Co-creation with diverse actors for sustainability innovation.....	8-459
<i>Sopjani, Liridona; Hesselgren, Mia; Ritzén, Sofia; Janhager Stier, Jenny</i>	
Underlying design motivations in design methods and outcomes	8-469
<i>Turner, Cameron; Agyemang, Malena</i>	
Characterisation of a co-creative design session through the analysis of multi-modal interactions	8-479
<i>Becattini, Niccolo; Masclet, Cedric; Ben-Guefrache, Fatma; Prudhomme, Guy; Cascini, Gaetano; Dekoninck, Elies</i>	
Fostering collaborative project emergence through divergence of opinion	8-489
<i>Ambrosino, Julien; Masson, Dimitri; Abi Akle, Audrey; Legardeur, Jérémie</i>	
On the products and experiences that make us happy.....	8-499
<i>Yang, Xi; Aurisicchio, Marco; Mackrill, James; Baxter, Weston</i>	
Positive and negative contamination in user interactions.....	8-509
<i>Baxter, Weston; Aurisicchio, Marco; Mugge, Ruth; Childs, Peter R. N.</i>	
The attentional capture of colour in visual interface design: a controlled-environment study	8-519
<i>Andersen, Emil; Maier, Anja</i>	
Using crowdsourcing to provide analogies for designer ideation in a cognitive study.....	8-529
<i>Goucher-Lambert, Kosa; Cagan, Jonathan</i>	
Heterogeneous engineering: Essential bridge implementing creative design.....	8-539
<i>Smulders, Frido</i>	
The practical side of engineering design	8-549
<i>Winkelmann, Paul Martin</i>	
Prototypical product shapes as a tool for aesthetic product design	8-559
<i>Maya, Jorge; Betancur-Rodríguez, Daniel</i>	

Design finds a way: Creative strategies to cope with barriers to creativity	8-569
<i>Gonçalves, Milene</i>	
Proposing a new product creativity assessment tool and a novel methodology to investigate the effects of different types of product functionality on the underlying structure of factor analysis.....	8-579
<i>Hazeri, Kamyar; Childs, Peter R. N.; Cropley, David</i>	
Learning by migrating: A computational study of diversity and team-level decision-making	8-589
<i>Thomas, Russell; Gero, John</i>	
Identifying opportunities for the implementation of UX design in industrial goods development	8-599
<i>Wölfel, Christian; Gärtner, Frank; Krzywinski, Jens; Siwek, Sandra</i>	
Literature based review of a collaborative design taxonomy	8-607
<i>Righter, James; Chickarello, Doug; Stidham, Hallie; O'Shields, Steven; Patel, Apurva; Summers, Joshua</i>	
Patches in sketches: Which type of sketch is more valuable for the end-user in the early phase of new product development.....	8-617
<i>Klapwijk, Anna Jeannette; Kostoulas, Nemo; Badke-Schaub, Petra</i>	

TABLE OF CONTENTS

Volume 9: Proceedings of the 21st International Conference on Engineering Design (ICED17)

Design Education

Enhancements in engineering design education at Austrian HTL	9-1
<i>Probst, Andreas; Gerhard, Detlef; Ramaseder, Norbert; Ebner, Martin</i>	
Providing a conducive environment to integrate design and production: Assessing the potentials of university-based fablabs (Ub-Fablabs)	9-11
<i>Botleng, Vomaranda; Brunel, Stéphane; Girard, Philippe</i>	
Integrated product development project in a multi-cultural and multi-professional background team: challenges and key success factors	9-21
<i>Lippert, Bastian; Ahrens, Martin; Dekhia, Jonathan; Louhichi, Rim; Song, Young-Woo; Toepfer, Ferdinand; Briede, Juan; Vajna, Sandor; Paetzold, Kristin; Borg, Jonathan</i>	
Success factors of an IPD based approach in a remote multidisciplinary team environment - Reflections on a case study...	9-31
<i>Asadi, Narges; Guaragni, Fausto; Johannknecht, Florian; Saidani, Michael; Scholle, Philipp; Borg, Jonathan; Panasiuk, Daryna</i>	
Experiences of product engineering conceptual design with patent drafting	9-41
<i>Lloveras, Joaquim</i>	
An educational method for enhancing the ability to design innovative products.....	9-49
<i>Yamada, Kaori; Tsumaya, Akira; Taura, Toshiharu; Shimada, Kenji; Kaihara, Toshiya; Yokokohji, Yasuyoshi; Sato, Ryuta</i>	
The use of social network sites in a global engineering design project.....	9-59
<i>Brisco, Ross; Whitfield, Robert Ian; Grierson, Hilary</i>	
A descriptive study of the effect of K-12 design education on changes in self-esteem	9-69
<i>Broussard, Kaylin; Murphy, Lauren; Fu, Katherine Kai-Se</i>	
Examining entrepreneurial motivations in an education context.....	9-79
<i>Lynch, Matthew; Slåttsveen, Kristoffer; Lozano, Federico; Steinert, Martin; Andersson, Gunnar</i>	
What green design activities and mindsets drive innovation and sustainability in student teams?.....	9-89
<i>Faludi, Jeremy; Agogino, Alice; Beckman, Sara; Iles, Alastair</i>	
Discursive vs. intuitive - An experimental study to facilitate the use of design catalogues.....	9-99
<i>Üreten, Selin; Krause, Dieter</i>	
Social innovation in the curriculum: a model for community engagement and design intervention	9-109
<i>de Vere, Ian; Charny, Daniel</i>	
Dropping concept bombs: Arguing for a knowledge-focused intervention in sketching to stimulate student engagement with visual thinking.....	9-119
<i>Ranscombe, Charlie; Bissett-Johnson, Katherine; Kuys, Blair</i>	
Exploitation of micro-learning for generating personalized learning paths.....	9-129
<i>Rusak, Zoltan</i>	
Correlation between team composition and team performance in virtual student product development teams	9-139
<i>Vukasinovic, Nikola; Cok, Vanja; Zavbi, Roman</i>	
Using studio teaching as an initiator and driver for research collaboration in design.....	9-149
<i>Liem, André; Ruecker, Stan; Alfonso de la Rosa, Juan</i>	

Makerbox: Introducing a low threshold maker experience for everyone – An online facilitation platform for problem based projects.....	9-159
<i>Slåttsveen, Kristoffer; Nygaard, Truls; Seviour, Georgina; Steinert, Martin; Aasland, Knut Einar</i>	
Navigating the common approaches to product development.....	9-169
<i>Vance, Julia K.; Giambalvo, Jack; Hoffenson, Steven</i>	
Towards assessing student gains in systems thinking during engineering design.....	9-179
<i>Tomko, Megan; Nelson, Jacob; Linsey, Julie; Bohm, Matt; Nagel, Robert</i>	
First View DesignLab: A fuzzy front end platform for innovation and education	9-189
<i>Hernandez-Monsalve, Maria Cristina; Velasquez-Montoya, Marcela; Mejia-Gutierrez, Ricardo; Hohn, Helga; Tassoul, Marc</i>	
Rapid prototyping products mapping live-data streams into tangible user interfaces.....	9-199
<i>Carulli, Marina; Bordegoni, Monica</i>	
Educational games for design and innovation: Proposition of a new taxonomy to identify perspectives of development...	9-209
<i>Cortes Sobrino, Ana; Bertrand, Miliane; Di Domenico, Enzo; Jean, Camille; Maranzana, Nicolas</i>	
Improving the sketching ability of engineering design students.....	9-217
<i>Hilton, Ethan Clark; Paige, Myela; Williford, Blake; Li, Wayne; Hammond, Tracy; Linsey, Julie</i>	
Reflection on classroom assessment in capstone design.....	9-225
<i>Brennan, Robert; Li, Simon</i>	
Differences between the discerning and opportunistic mind-sets in design learning.....	9-235
<i>Hamat, Basyarah; Eisenbart, Boris; Schoormans, Jan; Badke-Schaub, Petra</i>	
A creative learning space development toolkit: Empirical evaluation of a novel design method.....	9-245
<i>Thoring, Katja; Mueller, Roland; Badke-Schaub, Petra; Desmet, Pieter</i>	
Shifting paradigm: Towards a comprehensive understanding of quality	9-255
<i>Falk, Björn; Stylidis, Konstantinos; Wickman, Casper; Söderberg, Rikard; Schmitt, Robert</i>	
Change in peer efficacy of senior design students during a design project: a case study.....	9-265
<i>Patel, Apurva; O'Shields, Steven; Chickarello, Doug; Summers, Joshua; Turner, Cameron</i>	
Multidiscipline teams for intelligent innovation: Educating and training engineering and design students to co-creation.....	9-275
<i>Faucheu, Jenny; Boult, John; Delafosse, David</i>	
Competences for the development of smart products	9-285
<i>Herzog, Michael; Bender, Beate</i>	
Engineering design education in time-sensitive environments.....	9-295
<i>Jarrar, Majed; Anis, Hanan</i>	

Index of Authors

Aasland, K. E.	9-159	Araújo, A. C. C. d.	8-409
Abi Akle, A.	1-41, 6-61, 8-489	Arlitt, R.	3-211
Abramovici, M.	3-341, 6-327	Arnarsson, Í.	3-201
Achiche, S.	1-479, 4-31, 4-41, 4-395, 4-623	Arnarsson, Í. Ö.	7-71
Adamenko, D.	3-101	Arntz, S.	8-399
Adar, E.	3-311	Asadi, N.	5-131, 9-31
Adragna, P.-A.	1-121	Asbjorn Sorensen, C.	1-439
Agogino, A.	1-101, 9-89	Aschenbrenner, A.	4-79
Aguirre González, M.	8-169	Aßmann, G.	3-81
Agyemang, M.	8-469	Atherton, M.	6-81
Ahmed-Kristensen, S.	8-149	Augustsson, P.	5-131
Ahrens, M.	9-21	Aurisicchio, M.	4-523, 8-499, 8-509
Aknin, P.	4-307	Austin-Breneman, J.	1-219
Al Maghraoui, O.	3-91	Bader, B.	1-289
Al Mashagbeh, M.	4-159	Badke-Schaub, P.	8-449, 8-617, 9-235, 9-245
Albers, A.	1-309, 3-271, 4-239, 4-367, 4-435, 4-573, 6-257	Baek, J. S.	3-359, 4-693
Al-Dulaimi, T.	4-159	Balvay, A.	5-249
Alfonso de la Rosa, J.	9-149	Barattin, D.	8-1
Ali, F.	5-385	Barg, S.	3-1
Allison, J.	5-309	Baron, L.	4-31
Al-Masslawi, D.	3-181	Barron, O.	1-479
Almfelt, L.	1-11	Barton, S.	6-91
Altavilla, S.	5-375	Baumgartner, M.	4-129
Amaya, J.	1-121	Baur, C.	4-179
Amaya-Quiroz, J. S.	1-449	Bavendiek, A.-K.	5-41, 8-349
Ambrosino, J.	8-489	Baxter, W.	8-499, 8-509
Amrin, A.	4-219	Bayerlein, M.	4-189
Anacker, H.	3-251	Bazzaro, F.	2-427, 8-129
Andersen, A. K.	1-339	Beaini, D.	4-41
Andersen, E.	8-519	Becattini, N.	6-297, 8-479
Anderson, D.	1-349, 3-211	Becerril, L.	2-249, 4-405, 4-633
Andersson, G.	9-79	Beck, J.	2-249
Andrae, R.	6-1	Becker, J. M. J.	3-121
André, S.	3-191	Beckman, S.	9-89
Anis, H.	9-295	Beetz, J.-P.	5-81
Anparasan, A.	2-61	Beghelli, A.	4-493
Antle, A.	8-369	Behdinan, K.	2-309
Aoussat, A.	8-199	Behrendt, M.	4-573
Aoyama, K.	7-121	Bekhradi, A.	4-533, 5-317
		Belkadi, F.	4-327
		Ben Moussa, F. Z.	4-503

Bender, B.	1-199, 3-341, 4-317, 9-285	Bouchard, C.	2-121, 8-159
Ben-Guefrache, F.	8-479	Bougain, S. J.	3-111
Benmoussa, R.	4-503	Boujut, J.-F.	2-111, 2-457
Bennett, P.	8-99	Boult, J.	9-275
Benta, C.	2-347	Bouzidi, Y.	1-459
Bergsjö, D.	3-201, 6-11	Brandy, A.	8-199
Berkenbrock, G. R.	4-347	Bratec, F.	1-239
Berlin, C.	4-425	Bratt, C.	5-111
Bermell-Garcia, P.	6-247	Braun, A.	3-271
Bernabei, R.	5-71	Braun, T.	3-409
Bernard, A.	4-327	Breckle, T.	1-519
Bertelmann, K.	4-337	Breiner, S.	7-141
Bertoni, A.	4-99, 7-21	Brennan, R.	9-225
Bertoni, M.	1-319, 4-99, 4-513	Breunig, S.	4-69
Bertrand, M.	9-209	Briede, J.	4-493, 9-21
Betancur-Rodríguez, D.	8-559	Brisco, R.	9-59
Bey, N.	5-355, 5-385	Brockmöller, T.	4-445
Bibb, R.	5-327	Broman, G.	5-111
Binz, H.	1-131, 5-101, 6-21, 6-207, 8-79, 8-119	Broussard, K.	9-69
Bissett-Johnson, K.	8-269, 9-119	Brubaker, E. R.	1-259
Bitzer, M.	6-345	Brunel, S.	9-11
Bix, S.	2-71	Brunzini, A.	1-469
Bjarklev, K.	4-209	Buck, L. S.	2-417
Blanco, E.	6-277	Burnap, A.	4-473
Blessing, L.	1-349, 3-331, 5-179, 8-309	Bursac, N.	3-271, 4-435
Bligård, L.-O.	4-425	Butenko, V.	1-309
Blindheim, J.	4-287	Cagan, J.	2-51, 8-529
Blösch-Paidosh, A.	5-91	Camburn, B. A.	1-349, 3-211
Boa, D.	4-297, 8-99, 8-269	Campbell, G.	8-279
Boedhoe, R.	8-449	Campbell, R. I.	5-71
Bohm, M.	9-179	Cardoso, C.	8-399
Böhmer, A. I.	4-1	Carrasco, M.	4-493
Boisseau, E.	2-121	Carro Saavedra, C.	6-151
Bojcetic, N.	1-529, 2-1	Carulli, M.	9-199
Bokrantz, J.	3-71	Carvalho, M.	3-41
Boks, C.	5-355, 5-385	Cascini, G.	2-457, 6-297, 8-479
Bonaccorsi, A.	4-711, 6-101	Case, K.	4-21
Bonvoisin, J.	2-111	Cash, P.	8-419
Bordegoni, M.	8-359, 9-199	Casner, D.	4-653
Borg, J.	4-593, 9-21, 9-31	Cassidy, S.	2-219, 2-487
Borgianni, Y.	8-31, 8-139	Castorani, V.	5-365
Botleng, V.	9-11	Catic, A.	3-201
		Ceccacci, S.	4-463
		Chahin, A.	4-199
		Chakrabarti, A.	4-603

Chan, W. M. H.	1-61	Cudok, A.	5-209
Chanchevrier, N.	6-41	Currie, L. M.	3-181
Charny, D.	9-109	Dacleu Ndengue, J.	8-429
Charrier, M.	8-129	Dai, X.	6-337
Chen, J. L.	1-141	Daly, S.	4-553, 8-249
Chen, L.	4-11, 8-259	De Benetti, N.	4-711
Chen, R.	4-357	de Bont, C.	1-61
Chen, W.	6-317	De Guio, R.	4-503
Cherifi, A.	4-119	de Melo, D.	8-169
Chevrier, P.	6-277	de Oliveira Ferreira, P.	8-169
Chiarello, F.	4-711, 6-101	de Paula, D.	7-131, 8-319
Chickarello, D.	8-607, 9-265	de Vasconcelos, R.	8-169
Childs, P. R. N.	4-11, 8-259, 8-509, 8-579	de Vere, I.	9-109
Chirumalla, K.	2-259	de Vries, M.	4-51
Cho, K.	5-239	Deininger, M.	4-553
Choe, Y.	3-369	Dekhiar, J.	9-21
Choi, Y. M.	4-563	Dekoninck, E.	2-457, 8-479
Choo, P. K.	3-211	Delafosse, D.	9-275
Chouinard, U.	4-31, 4-395	Demminger, C.	6-91
Chuai, Y.	8-209	Demoly, F.	5-395
Chung, S.-H.	1-141	Deng, Q.	4-453
Cicconi, P.	5-365	Desmet, P.	3-331, 9-245
Clarkson, P. J.	2-219, 2-487, 3-399	Di Domenico, E.	9-209
Cluzel, F.	1-81, 4-533	Diaz Pichardo, R.	1-239
Cok, V.	9-139	Dickopf, T.	3-379
Collopy, A.	3-311	Diepschlag, F.	4-703
Colton, J. S.	1-71	Dittmann, C.	2-131
Condat, H.	2-477	Dobrigkeit, F.	8-319
Conradt, J.	4-1	Dong, A.	8-389
Constantinescu, C.	4-593	Dordlofva, C.	5-345
Contractor, N.	6-317	Dosi, C.	2-367, 2-387
Cormican, K.	7-131	Dotter, M.	6-41
Corney, J.	4-415	Dubois, S.	4-503
Corsini, L.	2-21	Duffy, A.	1-209, 5-189, 8-279
Cortes Sobrino, A.	9-209	Dumitrescu, R.	3-251
Costa de Araujo, A. C.	1-429	Ebeling, R.	4-259
Costa, D. G.	2-31	Ebner, M.	9-1
Costa, J.	2-31	Ebro, M.	4-209
Coton, J.	6-51	Echle, S.	6-169
Coulombe, C.	4-395	Eckert, C.	1-159, 1-229, 7-101
Coutts, E. R.	1-209	Edward, J.	1-209
Crilly, N.	8-11	Effah Kaufmann, E.	4-553
Cropley, D.	8-579	Eickhoff, T.	6-345
		Eigner, M.	3-379, 4-259, 6-345

Eisenbart, B.	8-389, 8-399, 9-235	Gärtner, F.	8-599
Elara, M. R.	8-309	Gatzen, M.	5-121
Elfsberg, J.	7-21	Gebert, M.	4-337
Elgh, F.	3-191, 6-267	Gebhardt, M.	4-663, 4-721
Emanuel, L.	2-299, 6-31	Gebus, P.	6-327
Eppinger, S.	2-317, 3-301	Gehring, B.	1-489
Ericson, Å.	3-351	Georgiades, A.	4-249
Ewald, B.	7-131	Geraldi, J.	2-189
Fadel, G.	4-267, 4-711	Gerber, J.-S.	1-489
Fahimian, M.	2-309	Gerhard, D.	3-61, 3-111, 5-151, 6-121, 9-1
Faißt, K.-G.	6-345	Gericke, K.	3-331, 7-101
Falk, B.	8-69, 9-255	Germani, M.	1-469, 5-199, 5-365
Faludi, J.	9-89	Gero, J.	7-171, 8-189, 8-589
Fantoni, G.	4-711, 6-101	Gerstenberg, A.	2-397
Farrugia, P.	8-299	Ghazanfari, E.	7-111
Faucheu, J.	8-429, 9-275	Giambalvo, J.	9-169
Feldinger, U. E.	4-139	Giannakos, A.	5-41
Felgenhauer, M.	4-189	Gidel, T.	8-339
Felix, V.	2-131	Gill, R. J.	5-259
Fels, A.	8-69	Gilmour, A.	3-211
Fels, S.	3-181	Giraldi, L.	4-463
Ferrise, F.	8-359	Girard, P.	9-11
Filippi, S.	8-1	Gladysz, B.	4-239
Fontana, F.	5-259	Göbel, J. C.	3-341, 6-327
Forchhammer, B. H.	3-171	Goevert, K.	4-129
Fortin, C.	3-417	Goh, Y. M.	4-21
Francalanza, E.	4-593	Gomes Martinho, C.	5-279
Franchini, G.	2-387	Gomes, S.	5-395
Frank, A. G.	8-289	Goncalves, C.	3-389
Franke, M.	4-453	Gonçalves, M.	8-569
Freund, T.	4-59, 4-277	Gonzalez de Heredia, A.	3-291
Frisch, B.	2-289	González, M.	1-429, 8-409
Fröhlich, T.	1-409	Gonzalez, R.	2-467
Fu, K. K.-S.	9-69	Gooch, S.	1-539
Fu, Y.	6-317	Gopsill, J.	2-299, 5-219, 6-31, 6-41
Fujisawa, T.	1-499	Goucher-Lambert, K.	8-529
Fujita, K.	1-379	Goudswaard, M.	5-31, 5-219
Fuller, M.	2-407	Gould, R.	5-111
Fundin, A.	5-131	Graessler, I.	3-261, 4-385
Gallacher, C.	4-623	Gralla, E.	2-61
Gamache, J.-F.	4-395	Gramlich, S.	1-269
Garbe, M.	7-151	Grandvallet, C.	6-141
Gardoni, M.	4-119, 6-111		
Garg, T.	3-301		

Granini, N.	2-169	Herrmann, H.-G.	4-229
Grashiller, M.	2-239	Herrmann, J.	2-61
Graziosi, S.	8-359	Herrmann, T.	8-79, 8-119
Grealy, M.	8-279	Herzog, M.	1-199, 3-341, 9-285
Greene, M.	2-467, 3-311	Hesselgren, M.	8-459
Grierson, H.	1-209, 7-31, 9-59	Hesselmann, C.	4-683
Groll, M.	3-321	Hicks, B.	2-299, 4-297, 5-31, 5-219, 6-31, 6-41, 8-99, 8-269
Gros, C.	2-111	Hilton, E. C.	9-217
Guaragni, F.	9-31	Hird, A.	2-209
Guenther, A.	8-389	Hoensbroech, F.	4-69
Guerra, A. L.	8-339	Hoffenson, S.	9-169
Gupta, R. K.	4-327	Hohn, H.	9-189
Gust, P.	4-703, 7-151	Höhn, M.	7-91
Gustafsson, G.	3-201	Holder, K.	1-369
Gustavsson, E.	7-71	Hollauer, C.	2-81, 2-289, 2-347, 4-405, 4-633, 7-91
Gzara, L.	8-289	Holliman, A.	2-209
Hackl, J.	3-151	Hölttä-Otto, K.	4-169
Hall, M.	6-247	Hong, Y. S.	2-437, 4-613
Hallstedt, S.	1-1, 1-51, 2-327, 5-229	Honold, C.	1-131
Hamat, B.	9-235	Hooshmand, Y.	3-101
Hammond, T.	9-217	Horvath, I.	7-1
Han, J.	4-11, 8-259	Hostettler, R.	4-1
Hangst, N.	5-11	Hou, T.	4-267
Hanna, M.	3-241	Houssin, R.	4-119
Hansen, J. H.	4-89	Howell, B.	1-151
Hansen, Z. N. L.	2-169	Hribernik, K.	4-453
Harrison, D.	6-81	Hu, J.	4-357
Harrison, J.	4-623	Huang, Y.	6-317
Hassannezhad, M.	2-219	Huret, M.	6-189
Hatano, Y.	1-499	Husung, S.	3-281
Hatcher, G.	8-31	Huth, T.	5-209
Hauksdóttir, D.	6-287	Hvam, L.	3-221
Hay, L.	5-189, 8-279	Hypki, A.	3-341
Hazeri, K.	8-579	Iizuka, T.	1-499
Heber, D.	3-321	Iles, A.	9-89
Hein, A. M.	2-477	Illmer, B.	5-169
Heinis, T.	5-279	Inkermann, D.	1-289, 5-209, 8-349
Helm, K.	8-249	Iriarte, I.	3-291
Henderson, D.	8-249	Irnazarow, A.	8-149
Hentze, J.	4-385	Isaksson, O.	3-71, 3-191, 3-201, 4-377, 6-179
Heredia Jiménez, J. A.	7-31		
Hernandez, W.	1-429		
Hernandez-Monsalve, M. C.	9-189		

Ishii, T.	6-355	Kaya, O.	3-201
Jablokow, K.	8-249	Kazakçı, A.	5-249
Jackson, M.	5-131	Kehl, S.	4-683
Jacobs, G.	2-131, 2-149, 6-197	Keshwani, S.	4-603
Jaghbeer, Y.	1-51	Khamesee, M. B.	4-159
Jagtap, S.	1-21, 1-439	Kiefer, J.	1-519
Janhager Stier, J.	8-459	Kilpinen, M.	2-497
Jankovic, M.	2-477	Kim, C.	5-239
Janny, B.	5-101	Kim, D.	2-437
Jarrar, M.	9-295	Kim, H.	6-71
Jean, C.	6-189, 9-209	Kim, K.	1-91
Jensen, C.	1-259	Kim, M.	1-91
Jensen, M. B.	4-287	Kim, Y. S.	3-231, 3-369
Jiang, P.	6-81	Kipouros, T.	4-249
Jimenez-Franco, L. D.	1-449	Kirchner, E.	1-269, 4-59, 4-277, 4-673, 5-81
Jirstrand, M.	7-71	Klapwijk, A. J.	8-617
Jochem, R.	2-111	Klasing Chen, M.	4-307
Joel-Edgar, S.	2-299, 6-31	Kleemann, S.	1-289, 1-409, 4-139
Joglekar, N.	2-317, 3-301	Kloberdanz, H.	4-673, 5-81
Johannesson, H.	3-71, 6-179	Knight, R.	1-209
Johannknecht, F.	5-121, 9-31	Knoll, A.	4-1
Johansson, C.	6-237	Kohl, M.	6-227
Johansson, J.	3-191, 6-267	Köhler, P.	3-101, 6-1
Johnson, A.	6-161	Kokkolaras, M.	3-389, 4-377
Jones, D.	1-159, 6-41	Komashie, A.	3-399
Jonsson, P.	1-319, 4-513	Koskela, L.	7-61
Jouanne, G.	1-239	Kößler, J.	3-51, 4-199
Jouini, O.	3-41	Kostoulas, N.	8-617
Judalet, N.	5-249	Kotovsky, K.	2-51
Juganaru-Mathieu, M.	8-429	Krahl, T.	4-483
Junk, S.	5-11	Kramer, J.	1-101
Juranic, J.	2-91	Krause, D.	3-151, 3-241, 9-99
Justel, D.	3-291	Kreimeyer, M.	1-489, 2-139
Kaihara, T.	9-49	Kremer, S.	4-483
Kammerl, D.	6-169, 7-91	Kristjansdottir, K.	3-221
Kampa, S.	7-151	Kroll, E.	7-61
Kampianakis, A.	2-199	Krömker, H.	3-281
Kar Ray, M.	3-399	Krzywinski, J.	8-599
Karlsson, A.	2-447	Kuhlenkötter, B.	3-341
Kaspar, J.	1-329, 4-229, 5-169	Kuhlmeier, M.	7-151
Kattner, N.	4-405, 4-633	Kunnen, S.	3-101
Kattwinkel, D.	1-199	Kunrath, K.	8-419
Katzwinkel, T.	2-149, 6-197	Kuys, B.	9-119
Kaul, T.	4-385		

Lachmayer, R.	4-445, 5-1, 5-51, 5-121, 5-141, 6-91, 6-217	Lindemann, U.	1-399, 2-81, 2-249, 2-289, 2-337, 4-1, 4-129, 4-179, 4-405, 4-483, 4-633, 4-663, 6-151, 6-227
Lacom, P.	2-427	Lindwall, A.	5-345
Lagadec, L.-R.	4-307	Linsey, J.	9-179, 9-217
Lagun Mesquita, P.	5-111	Lippert, B.	5-1, 5-51, 9-21
Lamé, G.	3-41	Lipsmeier, A.	3-251
Landahl, J.	3-71, 3-201, 6-179	Liu, Y.	4-357, 4-357
Landes, D.	4-573	Livotov, P.	4-653
Laousse, D.	4-307	Li-Ying, J.	8-419
Larsson, A.	1-21, 8-41	Lizarralde, I.	1-41
Larsson, J.	7-21	Lloveras, J.	9-41
Larsson, T.	4-513, 7-21	Lobbé, J.	8-129
Lasa, G.	3-291	Løkkegaard, M.	3-21, 3-141
Latvala, M.	8-219	Lorenzini, G. C.	8-41
Lauf, H.	3-1	Lotz, J.	4-59, 4-277
Laukemann, A.	6-21	Louhichi, R.	9-21
Laursen, L. N.	2-229	Löwer, M.	2-149, 6-197
Lavayssiere, P.	6-277	Lozano, F.	9-79
Le Dain, M.-A.	6-277, 8-289	Luedke, T.	2-239, 4-229
Le Glatin, M.	7-81	Luft, T.	1-389, 6-207
Le Gouguec, E.	5-249	Lugnet, J.	3-351
Le Masson, P.	4-307, 7-51, 7-81	Lumpe, T.	1-189
Lea, R.	3-181	Luo, J.	8-309
Leblond-Ménard, C.	4-31	Luthe, T.	1-189
Lee, H.	1-91	Lynch, M.	9-79
Lee, J.	4-553	MacDonald, E.	1-169
Legardeur, J.	8-489	Mackrill, J.	8-499
Legrand, J.	7-51	Madrid, J.	6-179
Lehmann, S.	2-11	Mahboob, A.	3-281
Lenau, T. A.	4-543	Maier, A.	2-11, 3-31, 3-171, 7-41, 8-519
Lenkenhoff, K.	3-341	Maier, T.	5-101
Leroux, M.	4-41	Mak, J.	2-487
Leroy, Y.	1-81, 4-267	Malizia, A.	6-81
Leuteritz, G.	5-51	Malmqvist, J.	3-201, 7-71
Levandowski, C.	3-71, 3-191, 3-201, 6-179	Mamo, J.	8-299
Li, S.	9-225	Mandolini, M.	1-469, 5-365
Li, W.	9-217	Manieri, S.	1-469
Liebal, A.	3-281	Manns, M.	1-519
Liem, A.	3-161, 9-149	Mantelet, F.	8-199
Lienkamp, M.	1-489, 2-139, 4-189	Maranzana, N.	9-209
Lim, M. J.	3-231	Marconi, M.	5-199
Lim, T.	3-211		
Lind, E.	2-447		

Marjanovic, D.	2-91	Miyazaki, C.	8-159
Markworth Johnsen, S. H.	3-221	Mohebbi, A.	4-395, 4-623
Marshall, R.	8-329, 8-379	Mombeshora, M.	2-457
Martinec, T.	8-229	Monici, D.	8-359
Martinez, V. G.	5-61	Montagna, F.	5-375
Mascle, C.	1-31	Montali, J.	6-131
Masclet, C.	8-479	Montavon, G.	5-395
Masson, D.	8-489	Morency, M.	2-61
Mata, I.	4-267, 4-711	Mortensen, N. H.	3-21, 3-141, 4-209, 6-287
Mathias, D.	4-297, 5-31, 8-99	Mörtl, M.	4-663, 6-169, 7-91
Matsuura, N.	1-499	Moryson, R.	8-59
Matta, N.	1-239	Motyka, Y.	1-51
Matthews, J.	6-41	Moultrie, J.	2-21, 5-327
Mattmann, I.	4-673	Mozgova, I.	4-445, 6-91, 6-217
Maya, J.	8-439, 8-559	Mueller, R.	9-245
Maynard, A.	4-473	Muenzberg, C.	2-189, 4-179
Mbassegue, P.	6-111	Mugge, R.	8-509
M'Bassègue, P.	4-119	Muggeo, C.	6-345
McAloone, T.	1-179, 5-299	Müller, J.	3-191, 3-201, 4-683
McComb, C.	2-51	Müller, M.	3-271
McGowan, A.-M.	2-467	Murphy, L.	9-69
McGregor, A.	1-539	Mussgnug, M.	8-59
McKay, A.	8-149	Nafei, N.	1-339
McMahon, C.	1-229, 6-247	Nagai, Y.	8-51
McTeague, C.	8-279	Nagel, R.	9-179
Meboldt, M.	5-259, 5-279, 8-59	Nassehi, A.	5-31, 5-219
Medeiros Leopoldino, K.	8-169	Naumann, T.	2-91, 2-279
Mehlstäubl, J.	4-633	Nelson, J.	9-179
Meiser, P.	4-229	Neroni, M. A.	8-11
Mejia-Gutierrez, R.	9-189	Neumann, M.	1-199
Mendoza, Y. E. A.	4-347	Newnes, L.	5-375
Mengoni, M.	4-463	Nguyen, P.	8-21
Menning, A.	2-101, 7-131	Nielsen, L. M.	1-339, 4-89
Merabtine, A.	1-459	Nigischer, C.	3-61
Merminod, V.	8-289	Nigra, M.	5-159
Mersch, F.	4-703	Nilsson, S.	2-417
Meussen, B.	5-21	Nogueira, G.	2-357
Miebach, T.	6-91	Nomaguchi, Y.	1-379
Mies, R.	2-111	Noubarpour, D.	7-161
Mignone, P. J.	1-509	Nygaard, T.	9-159
Millet, D.	1-111	Nyhuis, P.	6-91
Minel, S.	6-61	Nyström, T.	5-269
Mirkovic, K.	2-179	O'Hare, J.	2-457
Miura, S.	6-355	Obed, S.	4-553
Miyashita, T.	6-355		

Ocampo-Agudelo, J.	8-439	Planck, M.	1-339
Oehmen, J.	2-189, 2-199, 2-269	Pletikapic Exle, L.	1-529
Oh, G.	4-613	Poirson, E.	4-267
Oh, K.	2-437	Poorkiany, M.	6-267
Öhrwall Rönnbäck, A.	2-447, 5-345	Poreh, D.	1-101
Oizumi, K.	7-121	Potočki, E.	6-307
Olechowski, A.	2-317, 3-301	Pottebaum, J.	3-261
Olsson, A.	8-41	Pourroy, F.	6-141
Ölvander, J.	4-109	Pradel, P.	5-327
Omer, M.	2-81, 2-289, 2-347, 7-91	Prieto, P.	4-493
Omhover, J.-F.	2-121	Probst, A.	9-1
Ortlieb, C.	3-131	Prudhomme, G.	6-141, 8-479
O'Shields, S.	8-607, 9-265	Puchinger, J.	3-91
Otto, K.	2-41, 4-169	Raison, M.	1-479, 4-41
Overend, M.	6-131	Raja, V.	3-201, 4-377
Paetzold, K.	1-419, 3-51, 4-199, 9-21	Rajapaksha, J.	2-179
Pahk, Y.	3-359, 4-693	Ramananarivo, M.	1-479
Paige, M.	9-217	Ramaseder, N.	9-1
Panarotto, M.	1-319, 4-513, 6-237	Ramaswamy, N.	1-169
Panasiuk, D.	9-31	Ramsaier, M.	1-369
Papageorgiou, A.	4-109	Ranscombe, C.	8-269, 9-119
Papalambros, P.	2-467, 3-311, 4-473	Rasovska, I.	4-503
Paparo, M.	2-367	Raudberget, D. S.	3-191, 3-201
Park, D.	8-259	Ravindranath, R.	6-247
Parque, V.	6-355	Raviselvam, S.	1-349
Parraguez, P.	7-41	Ray, S.	3-399, 4-563
Parvin, M.	6-297	Rebentisch, E.	4-69
Patel, A.	8-607, 9-265	Reich, Y.	1-229, 7-11
Patel, S. V.	1-509	Reichwein, J.	1-269
Patou, F.	3-31	Reimche, W.	6-91
Pavkovic, N.	2-91	Reiß, N.	4-435, 6-257
Pelken, P. M.	6-131	Renaud, J.	4-119
Peng, Q.	8-239	Revfi, S.	4-367
Perez, K. B.	3-211	Rexfelt, O.	1-11
Perišić, M. M.	8-189	Reyes, T.	1-121, 1-239
Pessôa, M. V. P.	3-121	Riches, P.	1-359
Petit, G.	5-289	Richter, C.	4-1
Pialot, O.	1-111	Riesener, M.	3-1, 4-69
Piccolo, S.	2-11	Righter, J.	8-607
Pidgeon, L.	8-279	Rijken, D.	4-51
Pigosso, D.	1-179, 5-229, 5-299	Ringen, G.	2-377
Pigot, P.-V.	8-199	Ripperda, S.	3-241
Pikas, E.	6-227	Rismani, S.	1-249
		Ritzén, S.	2-417, 8-459
		Robinson, D.	2-179

Robinson, M.	8-149	Schmidt, W.	2-149, 6-197
Robinson, R. W.	2-497	Schmied, C.	4-663
Rodrigues, V.	1-179	Schmitt, R.	8-69, 9-255
Rohmer, S.	1-459	Schneberger, J.-H.	4-229
Rommel, C.	4-277	Schneider, M.	3-379
Roos, M.	1-269	Scholle, P.	3-261, 9-31
Rosa, M.	1-429, 2-357, 8-409	Schöner, M.	1-399
Rosen, D.	1-509	Schoormans, J.	9-235
Rossi, M.	2-269	Schöpe, F.	4-189
Rostama, G.	5-317	Schröder, W.	5-11
Roth, D.	1-131, 5-101, 6-21, 6-207, 8-79, 8-119	Schröppel, T.	1-299
Rotini, F.	8-139	Schuh, G.	3-1, 4-69
Rozenfeld, H.	2-31, 2-357	Schulte, J.	1-1, 2-327
Ruck, T.	6-257	Schulte, T.	3-379
Rudolph, S.	1-369, 1-519	Schütz, M.	1-189
Ruecker, S.	9-149	Schwarz, J.	1-189
Rüegg, F.	5-259	Schweigert, S.	1-399, 2-337
Runge, T.	3-131	Seepersad, C. C.	5-309
Rupprecht, S.	1-389	Segonds, F.	6-189
Rusak, Z.	9-129	Sersch, A.	4-703
Sadowska, A.	8-59	Sevier, D.	8-249
Sagot, J.-C.	2-427, 8-129	Seviour, G.	9-159
Saidani, M.	1-81, 9-31	Sextro, W.	4-385
Sakaguchi, A.	1-379	Sha, Z.	6-317
Salehi, V.	3-11	Shabestari, S. S.	4-317
Salopek, D.	2-1	Sharma, S.	4-249
Sammonds, G.	8-149	Sharpe, C.	5-309
Samuel, K.	2-111	Shea, K.	1-189, 5-91
Sanaei, R.	4-169	Sheppard, S. D.	1-259
Sanchez-Salas, A.	4-21	Shi, F.	4-11, 8-259
Sant, T.	8-299	Shimada, K.	9-49
Santiago, G.	1-429, 8-409	Siebrecht, J.	2-149, 6-197
Sato, R.	9-49	Siegel, A.	4-573
Sauchelli, M.	6-131	Sienko, K.	4-553
Savarino, P.	6-327	Silk, E.	8-249
Savill, M.	4-249	Silungwe, S.	1-259
Sbernini, F.	2-169	Simonsen, E.	4-425
Scalice, R. K.	4-347	Simundsson, A.	4-149
Scheidel, W.	6-217	Singh, V.	7-111, 8-219
Schiffbänker, P.	3-271	Sirina, N.	1-121
Schluer, C.	4-703	Siwek, S.	8-599
Schmid, A.	2-149, 6-197	Siyam, G.	2-497
Schmidt, M.	1-489, 2-139	Škec, S.	8-229
Schmidt, T. S.	4-199	Skoogh, A.	3-71
		Slåttsveen, K.	9-79, 9-159

Smojver, V.	6-307	Svengren Holm, L.	5-269
Smulders, F.	8-539	Tahboub, Z.	6-111
Snelders, D.	4-583	Takami, M.	1-379
Sng, K. H. E.	1-349	Talas, Y.	8-289
Snider, C.	2-299, 6-31, 8-99	Tam, M. K.-M.	1-509
Söderberg, R.	6-11, 6-179, 9-255	Tan, J.	2-41
Song, B.	8-309	Taptimthong, P.	6-91
Song, Y.-W.	9-21	Tassoul, M.	9-189
Sopjani, L.	8-459	Taura, T.	9-49
Sossou, G.	5-395	Taylor, C.	8-99
Spadinger, M.	1-309, 4-367	Thoben, K.-D.	4-453
Spandl, L.	4-239	Thoma, C.	2-139
Spitas, C.	4-219	Thomann, G.	6-51
Spruegel, T.	1-299	Thomas, L.	2-111
Stäbler, M.	1-419	Thomas, M.	7-51
Stacey, M.	7-101	Thomas, R.	8-589
Stahlmann, J.-T.	2-249	Thomson, A.	1-359, 2-209
Stal-Le Cardinal, J.	3-41	Thoring, K.	9-245
Stark, R.	2-111	Thorpe, J. R.	3-171
Starzyk, I.	4-523	Till, M.	1-369
Steger, W.	4-337	Toepfer, F.	2-279, 9-21
Steinert, M.	2-101, 2-397, 4-287, 9-79, 9-159	Tollestrup, C.	2-229
Stelvaga, A.	3-417	Tomassini, M.	8-139
Stelzer, R.	4-337	Tomko, M.	9-179
Stenholm, D.	3-201, 6-11	Tommelein, I.	6-227
Stetter, R.	1-369, 3-81, 4-149	Tournigand, C.	3-41
Stevens, L.	4-51	Treffitz, H.	1-449
Stewart, R.	5-355	Troussier, N.	1-121, 1-239
Stidham, H.	8-607	Trystram, G.	5-289
Stiefel, P.	4-683	Tsumaya, A.	9-49
Stingl, V.	2-189	Tufail, M.	1-91
Stocker, J. M.	1-489, 2-139	Türck, E.	1-289, 1-409
Stolt, R.	3-191	Türk, D.-A.	5-259
Stoop, M.	4-583	Turner, C.	8-469, 9-265
Štorga, M.	6-307, 8-189, 8-229	Tyl, B.	1-111
Strattner, M.	3-409	Ugurlu, S.	6-121
Ström, M.	3-201	Üreten, S.	9-99
Styliidis, K.	6-11, 9-255	Urquhart, L. W. R.	8-109
Subburaj, K.	8-309	Vajna, S.	2-159, 9-21
Subrahmanian, E.	1-229, 7-11, 7-141	Valjak, F.	2-1
Summers, J.	8-607, 9-265	Vallet, F.	1-111, 3-91
Summerskill, S.	8-329, 8-379	Valette, T.	4-533
Sun, G.	8-209	van den Broek, J.	4-51
Suryadi, D.	6-71	Van der Loos, H. F. M.	1-249
		van Loon, P.	5-269

Vance, J. K.	9-169	Wesugi, S.	1-499
Vasconcelos, L. A.	8-11	Whitfield, R. I.	7-31, 9-59
Velásquez-López, A.	1-449	Wickman, C.	9-255
Velasquez-Montoya, M.	9-189	Wilberg, J.	2-81, 2-289, 2-347, 6-227, 7-91
Velásquez-Rendón, D.	1-449	Wilkens, U.	3-341
Velde, F.	6-337	Willes, J.	4-623
Venkataraman, S.	8-309	Willett, K.	1-151
Verbaan, R.	8-399	Williford, B.	9-217
Vezzetti, E.	8-339	Willis, A.	8-369
Vielhaber, M.	1-329, 1-419, 2-239, 4-229, 5-169	Willumsen, P.	2-269
Vietor, T.	1-289, 1-409, 4-139, 5-41, 5-209, 8-349	Wilson, N.	1-359
Vignat, F.	6-141	Wilwer, J.	1-309
Vignoli, M.	2-367, 2-387	Winkelman, P. M.	8-549
Villeneuve, F.	6-51	Wise, A.	8-369
Viswanathan, V. K.	8-179	Withanage, C.	5-179
Vita, A.	5-365	Witzgall, C.	1-279
Voinot, T.	1-239	Wodehouse, A.	8-109
Vukasinovic, N.	9-139	Wölfel, C.	8-599
Vuletic, T.	8-279	Wolkenstein, P.	3-41
Wagner, C.	1-269	Wood, K.	1-349, 2-41, 3-211, 4-169, 5-179, 8-309
Wall, J.	4-513, 6-237	Wu, H.	4-415
Waltersdorfer, G.	3-331	Wulvik, A.	2-101
Wang, M.	6-317	Wünsch, A.	2-159
Wang, S.	3-11	Würtenberger, J.	4-59, 4-277
Wang, X.	8-209	Wurz, M. C.	6-91
Wang, Y.	4-643	Wynn, D.	2-179
Ward, M.	7-31	Xia, M.	2-337
Warell, A.	1-21, 1-439	Xiao, Y.	8-239
Wartzack, S.	1-279, 1-299, 1-389, 4-79, 6-207	Xie, Y.	6-41
Watschke, H.	5-41	Xu, J.	8-209
Webb, E.	1-539	Yamada, K.	9-49
Weber, C.	3-281, 4-573	Yanagisawa, H.	8-159
Weber, J.	1-419	Yang, H.	5-337
Wee, T. P. Y.	4-523	Yang, M.	1-219, 1-259
Weidmann, D.	4-405, 4-633	Yang, X.	8-499
Weil, B.	4-307, 7-51, 7-81	Yannou, B.	1-81, 3-91, 4-267, 4-533, 5-317, 6-61
Weiss, F.	5-101	Yannou-Le Bris, G.	5-289
Weißenbach, P.	5-151	Ye, X.	4-357
Weizhen, W.	8-51	Yilmaz, S.	8-249
Welo, T.	2-269, 2-377	Yokokohji, Y.	9-49
Wendrich, R.	8-89	Yu, S.	1-71
Wenngren, J.	3-351	Yuan, F.	8-51
Westermann, T.	3-251	Zavbi, R.	9-139

Zech, A.	1-369
Zeng, Y.	8-21
Zezelj, D.	1-529, 2-1
Zghair, Y. A.	5-141
Zhang, J.	4-643
Zhang, S.	6-161
Zhang, Z.	4-357
Zhao, Y.	5-337
Zhu, Z.	5-327