



2023
IHSED
International

5th International Conference on
**Human Systems
Engineering and Design:
Future Trends and
Applications
(IHSED 2023)**

September 27-29, 2023
University of Dubrovnik
Dubrovnik, Croatia

Final Program

WWW.IHSED.ORG

IHSED 2023

Conference Reception

WEDNESDAY, SEP 27 18:30 - 22:00 (CEST)

**RECEPTION LOCATION: BANJE BEACH RESTAURANT
UL. FRANA SUPILA 10/B, 20000, DUBROVNIK, CROATIA
(DRESS IS BUSINESS CASUAL, PHOTO ID REQUIRED)**

(Dress is business casual, Conference Registered Participants, Photo ID required)

Conference Organization

Scientific and Technical Session: September 28-29, 2023

Location: University of Dubrovnik

Location: Ul. branitelja Dubrovnika 41, 20000, Dubrovnik, Croatia

CONFERENCE HOSTING CHAIRS

MARIO MILIČEVIĆ, KRUNOSLAV ŽUBRINIĆ, DARKO ETINGER, CROATIA

CONFERENCE ADMINISTRATOR:

ADMIN[AT]IHSED.ORG

Scientific Tracks

| ACRONYM | TRACK |
|----------|---|
| IHSED 1 | Human-Centered Design |
| IHSED 2 | Innovative Materials for Product Development |
| IHSED 3 | Engineering, Design and Human Diversity |
| IHSED 4 | Safety Engineering and Systems Complexity |
| IHSED 5 | Fashion & Textile Design for Sustainability and |
| IHSED 6 | Biomechanics, Health Management & Medicine |
| IHSED 7 | Human Computer and System Interactions |
| IHSED 8 | Business Analytics and Technology |
| IHSED 9 | HFE in Construction, Mining and Fabrication |
| IHSED 10 | Education, Distance Learning and Training |

Conference at a Glance

Scientific and Technical Session: September 28-29, 2023
Location: University of Dubrovnik
Location: Ul. branitelja Dubrovnika 41, 20000, Dubrovnik, Croatia

IHSED Exhibitor:



Mazovia Cluster ICT was established on the initiative of the Institute for Market, Consumption and Business Research on November 27, 2007. Mazovia Cluster ICT is an accelerator of innovative projects and a connector between science, industry, administration, and society. Currently, the Mazovia Cluster ICT connects 9 research institutes, 6 renowned Polish universities and 3 investment funds. In addition, it brings together over 400 enterprises from the SME sector as well as large enterprises and business environment institutions.. For more information please visit: <http://klasterict.pl>

Thursday - Friday, September 28-29, 2023

| # | SESSION TITLE | ROOM | TRACK |
|---|---|-----------|---------|
| Day 1: Thursday, September 28 - Session Time: 9:00 - 10:30 CEST | | | |
| 1 | Human-centered Design I | Dubrovnik | IHSED 1 |
| 2 | Innovative Materials for Product Development I | Split | IHSED 2 |
| 3 | Systems Design and Human Diversity I | Pula | IHSED 3 |
| 10:30 - 11:00 • Sessions Break | | | |
| Day 1: Thursday, September 28 - Session Time: 11:00 - 13:00 CEST | | | |
| 4 | Safety Engineering and Systems Complexity | Dubrovnik | IHSED 4 |
| 5 | Fashion and Textile Design for Sustainability and Better Life I | Split | IHSED 5 |
| 6 | Biomechanics, Health Management & Medicine | Pula | IHSED 6 |
| | | | |
| End of Day 1 Sessions – Enjoy Lunch at the restaurant of your choice | | | |
| | | | |
| Day 2: Friday, September 29 - Session Time: 9:00 - 10:30 CEST | | | |
| 7 | Human Computer and System Interactions I | Dubrovnik | IHSED 7 |
| 8 | Business Analytics, Design and Technology I | Split | IHSED 8 |
| 9 | Human-centered Design II | Pula | IHSED 1 |
| 10:30 - 11:00 • Sessions Break | | | |
| Day 2: Friday, September 29 - Session Time: 11:00 - 13:00 CEST | | | |
| 10 | Human-centered Design III | Dubrovnik | IHSED 1 |
| 11 | Human-centered Design IV | Split | IHSED 1 |
| | | | |
| End of Day 2 Sessions – Enjoy Lunch at the restaurant of your choice | | | |

Detailed Program

| DAY 1 | | Track | Room |
|------------------------|---|---------|-----------|
| SESSION 1 | IHSED 1: Human-centered Design I | IHSED 1 | Dubrovnik |
| Thursday, Sept 28 | Session Chair(s): Ludwig Maul, Germany and Masayuki Ihara, Japan | | |
| 9:00 - 10:30 (CEST) | Customer-Centered Quality Function Deployment - A Framework for the Iterative Involvement of the Voice of the Customer and Derivation of Measurable Product Requirements in Innovation Design Dennis Dombrowski, Bernd Hienz, Stefan Aust, Ludwig Maul, Germany | | |
| | On-site-worker-centered design for work improvements Masayuki Ihara, Hiroko Tokunaga, Hiroki Murakami, Shinpei Saruwatari, Kazuki Takeshita, Akihiko Koga, Takashi Yukihira, Shinya Hisano, Masashige Motoe, Japan | | |
| | The Effect of Micro-Breaks on Intellectual Concentration Work: An Individual's Characteristics Measurement Orchida Dianita, Kakeru Kitayama, Kimi Ueda, Hirotake Ishii, Hiroshi Shimoda, Fumiaki Obayashi, Japan | | |
| | Data mining with Behaviour and Context- Based Optimal Navigation (BeaCON) for Optimal Navigation Arun Balakrishna, Tom Gross, Germany | | |
| | User-Centred Design of a Patient App for Carotid Artery Monitoring at Home Inga Müller, Jasmin Henze, Anja Burmam, Rutuja Salvi, Rainer Baum, Germany | | |
| | Adaptability as a multi-scale strategy for the regeneration of the built environment through circular economy perspective Cristiana Cellucci, Italy | | |

| DAY 1 | | Track | Room |
|----------------------------|---|----------------|--------------|
| SESSION 2 | IHSED 2: Innovative Materials for Product Development I | IHSED 2 | Split |
| Thursday, Sept 28 | Session Chair(s): Gabriel Caumo Vaz, Brazil and Shoko Miyagawa, Japan | | |
| 9:00 - 10:30 (CEST) | <p>Study on How New Technologies Have Been Used to Tackle Mobility Issues in Smart Cities Gabriel Caumo Vaz, Yuzo Iano, Gabriel Gomes de Oliveira, Euclides Lourenço Chuma, Wandercleiton Da Silva Cardoso, Alessandra Cristina Santos Akkari, Brazil</p> <p>What To Do When The Requirements Are Unknown? - Development of a Simulator for Excretory Care Shoko Miyagawa, Young Ah Seong, Zebing Mao, Tatsuhiko Horii, Hiroyuki Nabae, Shingo Maeda, Toshinori Fujie, Kenjiro Tadakuma, Hideyuki Sawada, Koichi Suzumori, Japan</p> <p>Methods for the collection and characterization of airborne particles in the textile industry Emilia Visileanu, Marian Catalin Grosu, Paul Tiberiu Miclea, Korinna Altmann, Dirk Brossell, Romania</p> <p>An Augmented Reality Book for Schematic English Reading Comprehension Development Skills in Grade 6 Students Kanita Nitjarunkul, Thailand</p> <p>From Handicrafts to Habitat: Investigating Terite's Applications in Space Brandon Cuffie, United States</p> | | |
| DAY 1 | | Track | Room |
| SESSION 3 | IHSED 3: Systems Design and Human Diversity I | IHSED 3 | Pula |
| Thursday, Sept 28 | Session Chair(s): Sebastian Stegmüller, Germany and Emmanuel Darmois, France | | |
| 9:00 - 10:30 (CEST) | <p>Logical Design Matrix (LDM): How to operationalize systemic projectual design thinking in complex contexts. Katherine Mollenhauer, Cala Del Rio, Javiera Rodriguez, Daniela Bianchi, Sara Riveros, Chile</p> | | |

An Experimental Examination of the Effects of the Invisible Human Experience on Self-esteem

Kimi Ueda, Maho Sasaki, Ayumi Noda, Hirotake Ishii, Hiroshi Shimoda, Japan

Standardisation in support of accessibility for mobility users in Europe

Emmanuel Darmois, Martin Boecker, France

The tetrahedron of sustainability design - a 3D framework for the integral and interdisciplinary development of circular economy oriented products

Sebastian Stegmüller, Franziska Braun, Germany

Designing for gender equity within the transport domain

Katie Parnell, Siobhan Merriman, Katherine Plant, United Kingdom

10:30 - 11:00 • Sessions Break

DAY 1

Track

Room

SESSION 4

IHSED 4: Safety Engineering and Systems Complexity

IHSED 4

Dubrovnik

**Thursday,
Sept 28**

Session Chair(s): Esther Bosch, Germany and Johanna Pulkkinen, Finland

**11:00 - 13:00
(CEST)**

When Something Is in the Way: Parameters of Perception and Reaction Speed in Train Drivers

Helena Wasle, Anne Goralzik, Birte Thomas-friedrich, David Schackmann, Esther Bosch, Germany

OSH risks of health and social care workers working in clients' homes in Finland

Johanna Pulkkinen, Maria Lindholm, Finland

Identifying occupational health and safety risk assessment development needs in Finnish case companies

Minna Rantala, Maria Lindholm, Sari Tappura, Jouni Kivistö-Rahnasto, Finland

Safety engineering in design of autonomous public transportation systems

Jari Laarni, Antti Vääänen, Finland

Contribution To Safety Standards and Their Relevance for Ergonomic Risk Assessment In Slovakia

Daniela Onofrejova, Hana Pacaiova, Slovakia

DAY 1

Track

Room

SESSION 5

IHSED 5:Textile Design for Sustainability and Better Life

IHSED 5

Split

**Thursday,
Sept 28**

Session Chair(s): David Schedl, Austria and Elena Pucci, Italy

**11:00 - 13:00
(CEST)**

Touch Sensing on Semi-Elastic Textiles with Border-Based Sensors

Samuel Zühlke, Andreas Stöckl, David Schedl, Austria

Sustainable regulation as driver for transformation in fashion industry

Elena Pucci, Maria Claudia Coppola, Italy

Integrated supply chain models in Italy. Cases study of circular economy in the Italian textile and fashion field.

Filippo Maria Disperati, Maria Antonia Salomè, Italy

Sustainable textile and circular economy: paradigm changing

Fernando Moreira da Silva, Portugal

Perspectives of Design for Recycling in Fashion System. Redefining fashion waste value models

Carmela Ilenia Amato, Martina Orlacchio, Italy

DAY 1

Track

Room

SESSION 6

IHSED 6: Biomechanics, Health Management & Medicine

IHSED 6

Pula

**Thursday,
Sept 28**

Session Chair(s): Marianna Oliverio, Italy and Maria Moga, Romania

**11:00 -13:00
(CEST)**

Usability testing of instructions for use in cleaning, disinfection and sterilization of ultrasound probes

Marianna Oliverio, Daniele Fiesoli, Simona Bellavia, Ramona De Luca, Italy

Sit-standing posture and chairless chair. A prototype without ground contact.

Maria Moga, Dan Radu Moga, Romania

Physiological and cognitive real-time stress analysis as a basis for optimised human-machine teaming and safe decision processes for military forces

Alexander Almer, Anna Weber, Florian Haid, Julia Tschuden, Lucas Paletta, Michael Schneeberger, Dietmar Wallner, Paul Glanz, Philip Klöckl, Dominik Eder, Gerald Bauer, Oliver Kühr, Thomas Hölzl, Austria

The Impact of the COVID-19 Pandemic on attitudes towards Human-Robot Collaboration in the Healthcare Environment

Verena Wagner-Hartl, Katharina Gleichauf, Ramona Schmid, Nicole Dewald, Germany

Can Transient Simulations Improve Lower Limb-Prosthesis Interaction Analysis?

Vasja Plesec, Gregor Harih, Slovenia

Classification of Depression Based on Functional Near-Infrared Spectroscopy (fNIRS) Signals Using Machine Learning Algorithms

Nahyun Lee, Jieming Zhang, Yongho Lee, Taekun Kim, Hong Jin Jeon, Hyewon Kim, South Korea

End of Day 1 Sessions – Enjoy Lunch at the restaurant of your choice

DAY 2

Track

Room

SESSION 7

IHSED 7: Human Computer and System Interactions

IHSED 7

Dubrovnik

Friday, Sep 29

Session Chair(s): Sven Hinrichsen, Germany and Nikola Tanković, Croatia

9:00 -10:30 (CEST)

How to select and implement a suitable Low-Code Development Platform
Sven Hinrichsen, Alexander Nikolenko, Kai Leon Becker, Benjamin Adrian, Germany

Modeling low-code databases with executable UML

Alan Bubalo, Nikola Tanković, Croatia

Validation of virtual reality tools for unique aircraft interiors

Kathrin Konkol, Hannah Reusing, Germany

Verification of the integration process of algorithms and sensor data for mental health applications

Victoria Lopez, Pavel Llamocca, Diego Urgelés, Yury Jiménez, Cesar Guevara, Carlos Viñals, Maria Espinosa, Spain

Preserving the Human Element in Pilot Weather Reports (PIREPs)

Daniela Kratchounova, Hannah Baumgartner, United States

Transdisciplinary design research of Homebound Seniors

Wen Huei Chou, Chung-wen Hung, Ya-ling Ko, Taiwan

Designer-AI interactions during the design process. Analysis of AI categories and their contribution to design, based on interaction typologies.

Elena Cavallin, Italy

DAY 2

Track

Room

SESSION 8

IHSED 8: Business Analytics, Design and Technology

IHSED 8

Split

Friday, Sep 29

Session Chair(s): Miljen Sirotic, Croatia and Sylwia Stefaniak, Poland

9:00 - 10:30 (CEST)

Revisiting Port Supply Chain Integration Complexity from the Perspective of Systems Leadership: A Bibliometric Analysis and Future Research Directions

Miljen Sirotic, Alen Jugovic, Croatia

Equipment-as-a-Service – necessary changes for service-based business models

Dimitri Evcenko, Holger Kett, Jürgen Falkner, Germany

Analysis of readiness to implement the level of knowledge and use of new digital technologies (AI, IoT and e-services) in the SOEs in Poland

Sylwia Stefaniak, Poland

Is there a clear understanding of using human factors and ergonomics at work?

Maria Lindholm, Elina Parviainen, Finland

An Implementation of Educational Programming Environment Using Tangible Materials

Toshiyasu Kato, Yasushi Kambayashi,
Koji Oda, Japan

The Environmental Benefit of Automatic
Idling Control of Connected and
Autonomous Vehicles in a Typical Urban
Network

Hoe Kyoung Kim, Younshik Chung,
Jihyeon Kim, Jihyo Jung, Soyun Kim,
Jungeun Cha, South Korea

Methodology of complementary research as
the basis for integrating science in fulfilling
its social mission in the future

Roman Maciej Kalina, Poland

DAY 2

Track

Room

SESSION 9

IHSED 1: Human-centered Design II

IHSED 1

Pula

**Friday, Sep
29**

**Session Chair(s): Yi Lin Wong, Hong Kong
and Yue Wu, Hong Kong**

**9:00 - 10:30
(CEST)**

Predicting comprehensibility of healthcare
signs using drawings from participants: A
pilot study of sign evaluation

Yi Lin Wong, Hong Kong SAR China

DJaytopia: a hybrid intelligent DJ co-
remixing system

Yue Wu, Anran Qiu, Liuxuan Ruan,
Xuejie Li, Jinhao Huang, Stephen Jia Wang,
Hong Kong SAR China

CoSculpt: An AI-Embedded Human-Robot
Collaboration System for Sculptural
Creation

Mingyuan Zhang, Zhaolin Cheng,
Sheung Ting Ramona Shiu, Jiacheng Liang,
Cong Fang, Zhengtao Ma, Stephen Jia Wang,
Hong Kong SAR China

Designing A Rehabilitation-Purposed No-
Direct-Contact Collaborative Robotic System
For Stroke Patients

Liyan Wei, Wenxuan Cheng,
Zhengzheng Luo, Mo Kit Yu, Chan Hiu Tung,
Zhengtao Ma, Yaqi Zhang, Stephen Jia
Wang, Hong Kong SAR China

Design and Development of an Electric
Power-assisted Quadricycle for Female Day-
trippers Visiting the Shonan Area

Takako Nonaka, Tatsuro Inage, Shuji
Takano, Yoshimi Miyata, Japan

Human-Centered Design for a Virtual Human led mHealth Intervention for Suicide Prevention
 Sharon Mozgai, Albert Rizzo, Arno Hartholt, United States

10:30 - 11:00 • Sessions Break

DAY 2

Track

Room

SESSION 10

IHSED 1: Human-centered Design III

IHSED 1

Dubrovnik

Friday, Sep 29

Session Chair(s): Michael Tondera, Germany and Müge Göken, Turkey

11:00 -13:00 (CEST)

Color matching research of electronic maps based on deep cognitive judgment
 Jingwen Xie, Bei zhang, Mengxiu Wang, China

Analysis on the influence of long endurance on the operation performance of electronic map color matching scheme
 Kaili Yin, ZiAng Chen, Chao Yang, Xiaoyi Zhou, China

The effect of operation steps on the efficiency of human-computer interaction
 Mengxiu Wang, Jingwen Xie, Qianfei Chen, China

The influence of button size on operation performance in long - term closed and isolated environment
 Qianfei Chen, Mengxiu Wang, Jingwen Xie, China

Using the Decision Ladder to understand human decision-making processes during a UAV-equipped SAR mission
 Sophie Hart, Victoria Steane, Mark Chattington, Seth Bullock, Jan Noyes, United Kingdom

| DAY 2 | | Track | Room |
|--|--|----------------|--------------|
| SESSION 11 | IHSED 1: Human-centered Design IV | IHSED 1 | Split |
| Friday, Sep 29 | Session Chair(s): Vítor Conceição, Portugal and Paula Trigueiros, Portugal | | |
| 11:00 -13:00 (CEST) | <p>Ecological Collaborative Support System for maritime navigation teams Vítor Fernando Plácido Da Conceição, Rafaela Marques, Pedro Água, Joakim Dahlman, Portugal</p> | | |
| | <p>Common variables of a good problem: contributions of inclusive design in and beyond academia Paula Trigueiros, Portugal</p> | | |
| | <p>In a Digital/Artificial Intelligence time can sketches still be useful for Design Process? Ana Moreira da Silva, Portugal</p> | | |
| | <p>Color materiality and urban equipment: factor of inclusion, comfort and safety Fernando Moreira da Silva, Margarida Gamito, Portugal</p> | | |
| | <p>Colour? What Colour? A difficult understanding between urban environment' professionals and users. Cristina caramelo gomes, Portugal</p> | | |
| <p>End of Day 2 Sessions – Enjoy Lunch at the restaurant of your choice</p> | | | |

Poster Demonstrations

Poster Demonstration Sessions:

| | | Room |
|--|--|--------------------|
| SESSION A | Poster Demonstration Session | Lobby Level |
| Thursday- Friday, September 28-29 [10:00 - 13:00] | | |
| A-1 | <p>QHS methodology to develop competency standards for talent management in customs agency Ramon Moreno Bravo, Rodolfo Martinez Gutierrez, Roberto Castro Bojorquez, Juan Gualberto Flores Velazquez, Mexico</p> | |
| A-2 | <p>Administration of Operations and Quality Systems with Social Responsibility in Customs Agency Rafael Solaiza Olachea, Rodolfo Martinez Gutierrez, Efren Plata Casas, Alfonso Alvarez Juan, Mexico</p> | |
| A-3 | <p>QHS methodology for strategic planning, KPIs and talent management in cross-border transport drivers Jose Luis De La Fuente Piñeirua, Rodolfo Martinez Gutierrez, Carlos Antonio Valdez Barrera, Pedro Valdez Barrera, Mexico</p> | |
| A-4 | <p>Toward an online rehabilitation exercise service based on personal independent living goals and risk management Takashi Yukihira, Hiroko Tokunaga, Masayuki Ihara, Hiroki Murakami, Akihiko Koga, Ryoichi Maeda, Shinpei Saruwatari, Kazuki Takeshita, Shinya Hisano, Masashige Motoe, Japan</p> | |
| A-5 | <p>Collaborative strategies of value co-creation in developing digital healthcare services Nina Helander, Finland</p> | |

SESSION B Poster Demonstration Session

**Lobby
Level**

Thursday- Friday, September 28-29 [10:00 - 13:00]

B-1

Personality Traits versus Emotional States in Human
Robot Interaction
Nina Rothstein, John Kounios, Hasan Ayaz, United
States

B-2

Exploring the Structural Characteristics of Tyson
Polyhedron Mesh for Improved Non-Contact Wearable
Electroencephalogram Products
Xiao Zhang, China

B-3

Morphological Evolution Study of Chinese Circle Chairs
from Song to Ming Dynasty Based on Computational
Design
Xiao Zhang, China

B-4

Human Systems Engineering and Design using Artificial
Intelligence and Natural Language Processing for
Education
Adriano Pila, Brazil

Call for Papers

Please join us for the

6th International Conference on

Human Systems Engineering and Design: Future Trends and Applications (IHSED 2023)

September 27-29, 2024

Split, Croatia

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