

Contents

IHSED 1: Human-Centered Design and User Experience

Applying Human-Centered Design and Human-Machine Integration Techniques to Solve Key Healthcare Problems	3
Neil Gomes and Viraj Patwardhan	
Subjective Evaluation of EV Sounds: A Human-Centered Approach . . .	10
Verena Wagner-Hartl, Bernhard Graf, Markus Resch, and Paco Langjahr	
Sequential Recognition Rate and Latency of Frequency-Based Tactons	16
Ricardo Jimenez and Ana Maria Jimenez	
Bringing It Together: Three Approaches to Combine Agile Software Development and Human-Centered Design	21
Michael Minge and Antonia Föhl	
User-Centered-Design Approach to Evaluate the User Acceptance of Seating Postures for Autonomous Driving Secondary Activities in a Passenger Vehicle	28
Sibashis Parida, Sai Mallavarapu, Sylvester Abanteriba, Matthias Franz, and Wolfgang Gruener	
User Evaluation of Industry 4.0 Concepts for Worker Engagement	34
Susanna Aromaa, Marja Liinasuo, Eija Kaasinen, Michael Bojko, Franziska Schmalfuß, Konstantinos C. Apostolakis, Dimitrios Zarpalas, Petros Daras, Cemalettin Öztürk, and Menouer Boubekeuer	
FatigueWatcher: Interactive Fatigue Detection for Personal Computer and Mobile Device	41
Ayumu Tanaka, Takashi Yokogawa, and Hiroaki Tobita	

Introduction of Service Design in a Public Hospital’s Medical Oncology Service	48
Carlos Romero-Piqueras, Jorge Sierra-Pérez, and Eduardo Manchado-Pérez	
Early Validation of User Needs in Concept Development: A Case Study in an Innovation-Oriented Consultancy	54
Marianne Kjørstad, Kristin Falk, Gerrit Muller, and José Pinto	
Introduction of User Experience into the Design of Academic Services at University Centre of Defence	61
Jorge Sierra-Pérez, Carlos Romero-Piqueras, Myriam Cilla, Silvia Guillén-Lambea, and Marcos Pueo	
Research on Aesthetics Degree Evaluation Method of Product Form . . .	68
Ming Li and Jie Zhang	
Sensemaking on the Bridge: A Theoretical Approach to Maritime Information Design	76
Brit-Eli Danielsen	
Examining Cloud Computing Applications from the Perspectives of Privacy and Unified Theory of Acceptance and Use of Technology . .	82
Tihomir Orehovački, Darko Etinger, and Snježana Babić	
Rob’Autism Project: Being Active in Social Interactions: The Robot-Extension Paradigm	88
Rénald Gaboriau, Sophie Sakka, Didier Acier, and Dimitri Delacroix	
Thermal Comfort Assessment: A Study Towards Workers’ Satisfaction in Metal Industry	95
Norma de Melo Pinto and Kazuo Hatakeyama	
Abductive Thinking, Conceptualization, and Design Synthesis	101
Dingzhou Fei	
Is Truth Contextual? The Browsing Purpose, the Availability of Comparable Material, and the Web Content Credibility Evaluation	105
Katarzyna Abramczuk, Michał Kąkol, Radosław Nielek, and Cezary Biele	
All Doors Lead to the Kitchen – Sustainability and Wellbeing Challenges in a Shared Centrepiece of Living	111
Sofie Andersson and Ulrike Rahe	
User as Customer: Touchpoints and Journey Map	117
Camila Bascur, Cristian Rusu, and Daniela Quiñones	
Enhancing User Experience with Embodied Cognition	123
SuKyoung Kim	

A Study on the Effect of Human Factor for Atypical Design in the Architectural Design Studio	130
Yungil Lee	
E-material Creating and Formatting Application	135
Kristine Mackare, Anita Jansone, and Maksims Žigunovs	
The User Experience of 3D Scanning Tangible Cultural Heritage Artifacts	141
Chee Weng Khong and Muhammad Asyraf Mhd Pauzi	
International Museums and Transcultural Impact on Gulf States: The Louvre Abu Dhabi as a Case Study	148
Mohamed El Amrousi, Mohamed Elhakeem, and Evan Paleologos	
Live Action Carnavalia: A Case Study of a Process for User Engagement	154
Vladimir Barros and Breno Carvalho	
Incorporating Human Factors in In-Plant Milk Run System Planning Models	160
Aleksandra Polak-Sopinska	
Design and Evaluation of an Innovative Assisting Device for Improving Blood Circulation in Osteoarthritis	167
Yan-Chun Lin and Fong-Gong Wu	
Evaluation of Matching Degree Between Touch Gestures and User Mental Model Based on Event-Related Potential	173
Ningyue Peng, Jing Ma, and Chengqi Xue	
Co-creation Workshop Oriented to the Autonomous Elderlies in Chile: Unveiling the Experience of the Participants	185
Juan Carlos Briede-Westermeyer, Cristhian Pérez-Villalobos, Javiera Ortega-Bastidas, and Isabel Leal-Figueroa	
Do Design Outcomes Get Influenced by Type of User Data? An Experimental Study with Primary and Secondary User Research Data	191
Abhishek Dahiya and Jyoti Kumar	
Medical Device Design Challenges Based on Users Hierarchy and Their Correlation with Illness	198
Fabiola Cortes-Chavez, Maria Giovanna-Trotta, Paulina Manzano-Hernandez, Alberto Rossa-Sierra, and Gabriela Duran-Aguilar	

Putting Chatbots to the Test: Does the User Experience Score Higher with Chatbots Than Websites?	204
Amélie Beriault-Poirier, Sandrine Prom Tep, and Sylvain Sénécal	
IHSED 1: User Interface Design Applications and Human-Systems Integration	
Making Multi-team Systems More Adaptable by Enhancing Transactive Memory System Structures – The Case of CDM in APOC	215
Dirk Schulze Kissing, Carmen Bruder, Nils Carstengerdes, and Anne Papenfuss	
Defining User Needs for a New Sepsis Risk Decision Support System in Neonatal ICU Settings Through Ethnography: User Interviews and Participatory Design	221
Richard Harte, Leo R. Quinlan, Evismar Andrade, Enda Fallon, Martina Kelly, Paul O’Connor, Denis O’Hora, Patrick Pladys, Alain Beuchée, and Gearoid ÓLaighin	
FLOW: A Software Application Designed to Help Older Adults Build Distance Interaction	228
Wonsil Jang, Stephen Gilbert, and Sunghyun Kang	
Learning from Human Behavior to Improve Preventative Health Information Systems	235
Remberto Martinez, Marcos Tong, Luis Diago, and Jaana Lindstrom	
Prototyping a User Interface for a New Sepsis Risk Decision Support System Using Participatory Design	242
Richard Harte, Leo R. Quinlan, Evismar Andrade, Enda Fallon, Martina Kelly, Paul O’Connor, Denis O’Hora, Patrick Pladys, Alain Beuchée, and Gearoid ÓLaighin	
A Proposal for an Affective Design and User-Friendly Voice Agent	249
Heesung Park, Jeongpyo Lee, Sowoon Bae, Daehee Park, and Yenah Lee	
Methodologies for the Design of ATM Interfaces: A Systematic Review	256
Joel Aguirre, Arturo Moquillaza, and Freddy Paz	
Design and Development of an Image-Based System to Facilitate Reading Comprehension of Chinese Classic Literature	263
Tung-En Chien and Shelley Shu-Ching Young	
Human Factors Integrated System Validation in the Nuclear Power Plant Main Control Room	268
Xiaoyang Ming, Guangwei Yu, and Shiguang Deng	

The Functional Requirement Analysis in Nuclear Power Plant Human System Interface Design	275
Shiguang Deng, Xiaoyang Ming, and Guangwei Yu	
A Preliminary Study on Color and Grayscale Images Object Recognition and Scene Classification Tasks on Amazon Mechanical Turk Crowdsourcing Platform	282
Aimee Yun-Fang Lin, Shelley Shwu-Ching Young, Harrison Pang-Sheng Lai, and Danna Gurari	
Design of an Integrative System for Configurable Exergames Targeting the Senior Population	287
Teresa Paulino, John Muñoz, Sergi Bermudez, and Mónica S. Cameirão	
Research Based on Product Design: The Example of Spimi Skin Detector	293
Cao Ying and Cao Jing	
Development of a Prototype for Non-contact Keyboard	299
Yasushi Kambayashi, Keita Ueda, Masanari Kasahara, Tatsumi Kusano, and Munehiro Takimoto	
IHSED 1: Virtual Reality and Usability Evaluation Applications	
Augmented Reality in the Context of Naval Operations	307
Mário Marques, Filipe Elvas, Isabel L. Nunes, Victor Lobo, and Anacleto Correia	
Strategies and Metrics for Evaluating the Quality of Experience in Virtual Reality Applications	314
Xiangjie Kong and Yuqing Liu	
An Initial Design of the Mei Garden Augmented Reality Tour-Guide System Based on the Needs Analysis	320
Hung-Yeh Lin and Shelley Shwu-Ching Young	
Designing Virtual Reality to Enhance Spatiality	326
Youngil Cho and Suehusa Mamoru	
UNICAP Virtual: User Experience for a VR Application in Brazilian University	332
Christianne Soares Falcão and Breno Carvalho	
State of the Art and Future Trends in the Usability of Patient Monitors	338
Evismar Andrade, Leo R. Quinlan, Richard Harte, Dara Byrne, Enda Fallon, Martina Kelly, Paul O'Connor, Denis O'Hora, Michael Scully, John Laffey, Patrick Pladys, Alain Beuchée, and Gearoid ÓLaighin	

Usability Evaluation of a Public Transport Mobile Ticketing Solution	345
Daniel Meireles de Amorim, Teresa Galvão Dias, and Marta Campos Ferreira	
Investigation of the Human Factors, Usability and User Experience of Patient Monitors used in a Hospital Setting	352
Evismar Andrade, Leo R. Quinlan, Richard Harte, Dara Byrne, Enda Fallon, Martina Kelly, Paul O'Connor, Denis O'Hora, Michael Scully, John Laffey, Patrick Pladys, Alain Beuchée, and Gearoid ÓLaighin	
Usability Assessment as a Guide to Improve the System Design of a Corneal Topographer	358
Carlos Aceves-Gonzalez, Carlos D. de Leon-Zuloaga, Zuli T. Galindo-Estupiñan, and Citlali Díaz-Gutierrez	
Investigation of Usability Issues Through Physiological Tools: An Experimental Study with Tourism Websites	365
Jyotish Kumar and Jyoti Kumar	
IHSED 1: Human-Machine Collaboration	
The Human-Tech Matrix: A Socio-Technical Approach to Evaluation of Automated Transport Systems	375
Jonas Andersson, Tor Skoglund, and Niklas Strand	
Designing and Management of Intelligent, Autonomous Environment (IAE): The Research Framework	381
Edmund Pawlowski, Krystian Pawlowski, Jowita Trzcielinska, and Stefan Trzcielinski	
Impact of Machine's Robotisation on the Activity of an Operator in Picking Tasks	387
Adrian Couvent, Mathieu Dridi, Nicolas Tricot, Christophe Debain, Mahmoud Almasri, Gil De Sousa, Gerald Chaloub, Marie Izaute, and Fabien Coutarel	
On the Lack of Pragmatic Processing in Artificial Conversational Agents	394
Baptiste Jacquet, Olivier Masson, Frank Jamet, and Jean Baratgin	
Optimal Design of a Robotic Assistant Based on the Structural Study Using Finite Elements	400
Graciela Serpa-Andrade, Luis Serpa-Andrade, Vladimir Robles-Bykbaev, and Irene Serpa-Andrade	

Human-Autonomous Technology Interaction: A Systemic-Structural Activity Theory Perspective	407
Julian P. Vince and Gregory Z. Bedny	
IHSED 1: Design Evaluation, Learning and Assessment	
Research Design to Access the Mental Workload of Air Traffic Controllers	415
Thorsten Mühlhausen, Thea Radüntz, André Tews, Hejar Gürlük, and Norbert Fürstenau	
Measuring Collaborative Emergent Behavior in Multi-agent Reinforcement Learning	422
Sean L. Barton, Nicholas R. Waytowich, Erin Zaroukian, and Derrik E. Asher	
Products as Mass Media: Entertainment vs. Edification	428
Del Coates	
Graphic Design Analysis Model	433
Elisabete Rolo	
Education and Training of Road Safety Auditors on the Implementation of Human Factors Principles in Safe Road Design	439
Sophia Vardaki and Evangelos Bekiaris	
Ergonomic Analysis in the Welding Laboratory of the Federal Institute of Paraíba – IFPB, João Pessoa Campus	445
Amanda Ramos de Amorim and Aarão Pereira de Araújo Junior	
Overview of Empathetic Approaches to Design Inclusive Products	451
Maria Giovanna Trotta Munno, Luis Alberto Rosa Sierra, and Fabiola Cortes Chavez	
Assistive Devices for Lower Limbs Under Mechanism of Neuromodulation and Blood Circulation	457
Hui-I Yin and Fong-Gong Wu	
Packaging Design to Support Small Business Enterprises in the Republic of El Salvador	463
Alberto Rossa-Sierra, Maria Giovanna Trotta, Fabiola Cortes-Chavez, and Francisco González-Madariaga	
The Importance of Industrial Design in Medical Devices in the 21st Century	469
Fanny Guadalupe Valdivia-Márquez, Pilar Hernandez-Grageda, Gabriela Durán-Aguilar, and Alberto Rossa-Sierra	

IHSED 2: Innovative Materials for Product Development

Prevention of Work-Related Musculoskeletal Disorders Using Smart Workwear – The Smart Workwear Consortium 477
 Carl Mikael Lind, Leif Sandsjö, Nafise Mahdavian, Dan Högberg,
 Lars Hanson, Jose Antonio Diaz Olivares, Liyun Yang,
 and Mikael Forsman

Smart Textiles and Their Role in Monitoring the Body’s Fitness and Medical Conditions 484
 Mohamed Eldessouki, Redha Taiar, Tareq Ahram, and Stanislav Petrik

Quantifying Sense of Depth Towards Visual Texture Using Optics Simulation 491
 Masaki Shimomura, Ruriko Kamesaka, Mugi Nishihara, Kei Matsuoka,
 Takamasa Yoshimura, Takeo Kato, and Yoshiyuki Matsuoka

Factor Analysis of Synesthetic Perceptual Dimensions Using Aluminum Alloy Material Textures Surface in Industrial Products 498
 Jialun Huang, Xiaozhou Zhou, Chengqi Xue, Lei Zhou, and Yafeng Niu

Multi-objective Optimization Applied to the Bioclimatic Design of Dwellings with Ecomaterials 506
 Jesús Rafael Hechavarría Hernández, Robinson Vega Jaramillo,
 and Boris Forero Fuentes

Assistance System (AS) for Vehicles on Indian Roads: A Case Study 512
 Neha Soni, Enakshi Khular Sharma, Narotam Singh,
 and Amita Kapoor

IHSED 3: Systems Design and Human Diversity Applications

Comfort Design in Human Robot Cooperative Tasks 521
 Alireza Changizi, Morteza Dianatfar, and Minna Lanz

PlayCube: Designing a Tangible Playware Module for Human-Robot Interaction 527
 Vinicius Silva, Filomena Soares, João Sena Esteves,
 and Ana Paula Pereira

Design for Seniors: A Case Study Based on Human Centric Lighting 534
 Aldo Deli, Massimo Di Nicolantonio, and Emilio Rossi

Human Diversity and Organizational Culture 540
 Barbara Mazur

Predictors of Preference for the Activity-based Flexible Office	547
Linda Rolfö, Helena Jahncke, Lisbeth Slunga Järvholm, Maria Öhrn, and Maral Babapour	
Affective Design Approach to Mobile Security Authentication	554
Daehee Park, Jaeyong Lee, Yenah Lee, and Scott Song	
An Experimental Study on Relationship Between Intellectual Concentration and Personal Mental Characteristics	560
Wakako Takekawa, Kimi Ueda, Shogo Ogata, Hiroshi Shimoda, Hirotake Ishii, and Fumiaki Obayashi	
Product Packaging Evaluation Through the Eyes of Elderly People: Personas vs. Aging Suit vs. Virtual Reality Aging Simulation	567
Christina Zavlanou and Andreas Lanitis	
Design for Innovative Development in Construction Industry: Proposal Based on Comparative Analysis	573
Kazuo Hatakeyama	
An Evaluation Method for Intellectual Concentration Based on Concentration Depth	579
Kimi Ueda, Shota Shimonaka, Hiroshi Shimoda, Hirotake Ishii, and Fumiaki Obayashi	
Application of the Principle of Conformal Symmetry in the Structure of Human Internal Organs	585
Galina Spirina	
Design of a Framework to Promote Physical Activity for the Elderly	589
Alexandre Calado, Pedro Leite, Filomena Soares, Paulo Novais, and Pedro Arezes	
Construction of Multi-purpose Japanese Sign Language Database	595
Yuji Nagashima	
Product Function Analysis: Reducing Cost of Production Service Line with Work Teams	600
Velia Castillo-Pérez, Liliana Carrasco-Arméndariz, Mario Corral-Chacón, and Ramon Elizondo-Rios	
Systemic Approach for Inclusive Design of Low-Income Dwellings in Popular Settlements at Guayaquil, Ecuador	606
Boris Forero, Jesus Rafael Hechavarría Hernández, Silvia Alcivar, and Virginia Ricaurte	

IHSED 3: Artificial Intelligence and Intelligent System Design

VibroTac S: An Electronic Assistive Device for Blind and Visually Impaired People to Avoid Collisions 613
Simon Schätzle, Thomas Hulin, and Benedikt Pleintinger

Real Time Traffic Incident Detection by Using Twitter Stream Analysis 620
Maryam Afzaal, Nazifa Nazir, Khadija Akbar, Sidra Perveen, Umer Farooq, M. Khalid Ashraf, and Zonia Fayyaz

On Inverse Problem of Artificial Intelligence in System-Informational Culture 627
Nicolay Vasilyev, Vladimir Gromyko, and Stanislav Anosov

Analysis on IoT Activities in Japanese Companies: Toward Innovation or Cost Reduction 634
Yuriko Sawatani

Ethical Problems of Introducing Artificial Intelligence into the Contemporary Society 640
Olga Burukina, Svetlana Karpova, and Nikolas Koro

Systemic Analysis of Bioclimatic Design of Low-Income State-Led Housing Program “Socio Vivienda” at Guayaquil, Ecuador 647
Santiago Dick, Jesús Rafael Hechavarría Hernández, and Boris Forero

Methodology of Shaping the Agility of the Intelligent Autonomous Environment Management System 652
Stefan Trzcielinski, Jowita Trzcielinska, Edmund Pawlowski, and Krystian Pawlowski

IHSED 4: Safety Engineering and Complex Systems Design

High-Hazard Complex Systems Design: HF Integration in Practice 661
Karen Priestman

Developing Safety Competence Process for Vocational Students 668
Sari Tappura, Sanna Nenonen, and Noora Nenonen

Capturing the Ups and Downs of Accidents’ Figures – The Portuguese Case Study 675
Celina P. Leão, Susana Costa, Néilson Costa, and Pedro Arezes

Experimental Investigations and Finite Element Modelling of the Vibratory Compartment of a Manual Wheelchair 682
Nadir Skendraoui, Fabien Bogard, Sébastien Murer, Fabien Beaumont, Boussad Abbes, Guillaume Polidori, Jean-Baptiste Nolot, Damien Erre, Serge Odof, and Redha Taiar

Remaining Useful Life as Prognostic Approach: A Review	689
Beata Mrugalska	
IHSED 4: Occupational Safety and Risk Assessment	
Are Teammate Trust and Confidence Dissociable in Risk Intensive Human Machine Teaming?	699
John G. Blich and Anna D. Skinner	
Predicting the Level of Safety Performance Using an Artificial Neural Network	705
Emmanuel Bannor Boateng, Manikam Pillay, and Peter Davis	
Augmented Reality for Health and Safety Training Program Among Healthcare Workers: An Attempt at a Critical Review of the Literature	711
Anna Rita Corvino, Elpidio Maria Garzillo, Paola Arena, Arcangelo Cioffi, Maria Grazia Lourdes Monaco, and Monica Lamberti	
Evaluation of Occupational Safety and Ergonomics in the Reuse and Recycling of Solid Materials	716
Hebert R. Silva	
Kaizen Approach for the Systematic Review of Occupational Safety and Health Procedures in Food Industries	722
Renan Zocca, Tânia M. Lima, Pedro D. Gaspar, and Fernando Charrua-Santos	
The Organizational Safety Culture Assessment	728
Alin Gaureanu, Anca Draghici, Corina Dufour, and Hugo Weinschrott	
IHSED 4: Transportation System Design and Safety Engineering	
Driver Stress Response to Self-driving Vehicles and Takeover Request – An Expert Assessment	737
Paul März and Uwe Handmann	
Monitoring Driver Posture Through Sensorized Seat	744
Alberto Vergnano and Francesco Leali	
Evaluation of Persona-Based User Scenarios in Vehicle Development	750
Stefanie Beyer and Alexander Müller	
Participatory Design for Optimizing the Implementation of New Transport Technology	757
Elise Crawford, Yvonne Toft, Ryan Kift, and Geoff Dell	

Modularity in Seaport Management: Identification of the Research Problem	763
Janusz Rymaniak and Bogdan Nogalski	
Intelligent Material Transportation System Design for Small and Medium-Sized Plants	770
Rujun Gao	
A New Approach to Green Light Optimal Speed Advisory (GLOSA) Systems and Its Limitations in Traffic Flows	776
Hironori Suzuki and Yoshitaka Marumo	
Path Planning Based on A* Algorithm for Unmanned Surface Vehicle	783
Kang Hou, Xiaojuan Lan, Yucheng Zhang, and Sumarga Kumar Sah Tyagi	
IHSED 4: Safety Evaluation and Ergonomic Risks	
Human Machine Interface Issues for Drone Fleet Management	791
Salvatore Luongo, Marianna Di Gregorio, Giuliana Vitiello, and Angela Vozella	
A Comparative Analysis of AS/NZS 4801, ISO 45000 and OHSAS 18001 Safety Management Systems	797
Manikam Pillay	
Workplace Violence in Finnish Emergency Departments	804
Johanna Pulkkinen	
Methodological Proposal for Ergonomic Risks Evaluation	809
Cesar Corrales and Milagros Chambe	
IHSED 4: Organizational and Strategic Interventions	
ERGO@OFFICE: A Participatory Ergonomics Approach for Strategic Interventions and Prevention of Musculoskeletal Disorders in SMEs	819
Tânia M. Lima and Denis A. Coelho	
Interdisciplinary Design Teams in Poland - Architecture as a Tool for Preventing Hospital-Acquired Infections	826
Rafal Janowicz	
Study of the School Furniture Adequacy to Students' Anthropometric Dimensions	832
Agostinho Fernandes, Paula Carneiro, Nelson Costa, and Ana C. Braga	

Formalization and Quantification of Team Contexts for Meso-cognitive Studies	838
Taro Kanno, Daichi Mitsuhashi, Satoru Inoue, Daisuke Karikawa, and Kohei Nonose	
IHSED 5: Sports Design and Sports Medicine	
DJ-Running: Wearables and Emotions for Improving Running Performance	847
Pedro Álvarez, José Ramón Beltrán, and Sandra Baldassarri	
A Survey of Motion Capture Technology and Its Application in Sports	854
Tianyu He and Qi Luo	
Experimental Elucidation on Balance Mechanism in Golf Swing for Performance Improvement	860
Minoru Fukumoto, Kyoko Shibata, Yoshio Inoue, and Motomichi Sonobe	
Organization of Tennis Clubs to Eliminate Barriers Most Frequently Specified by People with Visual Impairments	866
Aleksandra Polak-Sopinska and Ewa Nebelska	
Design and Realization of Catching and Grappling Course Multimedia CAI System Based on Web	873
Xin Wang	
IHSED 6: Biomechanics, Evaluation and Assessment	
Full Body Three Dimensional Joint Angles Validation Using TEA Ergo Inertial Measurement Units	879
Thomas Peeters, Stijn Verwulgen, Raman Garimella, Koen Beyers, and Steven Truijen	
Biomechanical Digital Human Models: Chances and Challenges to Expand Ergonomic Evaluation	885
Markus Peters, Eric Quadrat, Alexander Nolte, Alexander Wolf, Jörg Miehling, Sandro Wartzack, Wolfgang Leidholdt, Sebastian Bauer, Lars Fritzsche, and Sascha Wischniewski	
Variable Diagnostic and/or Strengthening Training Equipment for the Upper-Body Muscles	891
Lubomír Šooš and Alena Cepková	
Workers' Body Constitution as a Risk Factor During Manual Materials Handling	898
Ana Colim, Pedro Arezes, Paulo Flores, and Ana Cristina Braga	

The Evaluation of the Interaction Between Human Buttocks Thighs and Wheelchair Seat Cushion to Prevent Pressure Ulcers Using Finite Element Analysis	904
He Thong Bui, Philippe Lestriez, The Nhan Pham Nguyen, Le Van Nguyen, Quang Bang Tao, Karl Debray, Thi Hai Van Nguyen, and Redha Taiar	
Design and Realization of Police Physical Fitness Assessment Management System	911
Xin Wang	
EMG Comparison of Sport Manual Wheelchair Propelled by Lever Drive and Push Rims and Possible Consequences for Rehabilitation: A Case Study	915
Krzysztof Fiok, Michalina Błażkiewicz, Ida Wiszomirska, Nadir Skendraoui, Fabien Bogard, Sébastien Murer, and Redha Taiar	
Validation of a Digital Interface for Assessment of Motor Function Based on MFM	921
Adriana Gomes L. de Souza, Dominique Vincent-Genod, Carole Vuillerot, Michel Dubois, and Guillaume Thomann	
Anthropometric Evaluation of the Classroom Desk for Middle Schools	927
Ahamed Altaboli, Omar Elfituri, Ahmed Alturkey, Mohammed Dogman, and Mohammed Almagrhi	
Noninvasive Estimation of Lumbar Intervertebral Disk Load Using Multiple Regression Analysis to Consider the Pelvic Tilt	933
Kyoko Shibata, Yasuhito Tsuyoshi, Yoshio Inoue, Hironobu Satoh, and Motomichi Sonobe	
Development of Stride Estimation System for Improvement of Walking Efficiency	939
Gen Miyamoto, Kyoko Shibata, Motomichi Sonobe, and Yoshio Inoue	
Estimation of Hip Joint Moment by an Inertial Measurement Unit	946
Hiroki Kotani, Kyoko Shibata, Motomichi Sonobe, Yoshio Inoue, and Hironobu Satoh	
IHSED 6: Health Management and Rehabilitation	
Medical Devices Vigilance, «Matériorvigilance», as an Actor of the Hospital Safety Culture	955
Marine Berrué and Dominique Thiveaud	

Assessment of Therapeutic Progress After Acquired Brain Injury Employing Electroencephalography and Autoencoder Neural Networks	961
Adam Kurowski and Andrzej Czyżewski	
Development of a Biomechanical Bike with Assistive Technologies to Be Used for Rehabilitation	968
Anabela Gomes, Álvaro Santos, Carlos Alcobia, César Páris, Deolinda Rasteiro, Emília Bigotte, Fernando Moita, Filipe Carvalho, Gabriel Pires, Jorge Lains, Pedro Amaro, and Luís Roseiro	
National Patient Registry: A Web-based Technological Solution for Haemophilia in Portugal	974
Leonor Teixeira, Vasco Saavedra, Beatriz Sousa Santos, and Carlos Ferreira	
A Classification of Motor Imagery Brain Signals Using Least Square Support Vector Machine and Chaotic Particles Swarm Optimization	981
Arwa N. Al-Edaily	
Robotic System for Active-Passive Strength Therapy	987
Eliseo Cortes Torres, Anibal Alexandre Campos, Daniel Martins, and Eduardo Bock	
Preliminary Study of Facial Soft Tissue Thickness in Indian Children from Mumbai City	994
Parth Shah, Yan Luximon, and Vividh Makwana	
The Influence of the Manner of Grasping a White Cane on the Ability of Visually Impaired People to Perceive the Texture of Objects	1000
Kiyohiko Nunokawa, Manabu Chikai, Kouki Doi, and Shuichi Ino	
A Contactless Walking Stick Using a Depth Sensor and Vibrators	1007
Dai Kudo, Munehiro Takimoto, and Yasushi Kambayashi	
A Study for Adapting the Monitoring System in Order to Prevent Fall Down from a Bed	1013
Hironobu Satoh and Kyoko Shibata	
Therbligh Motions as a Basic of Movement Therapy for Stroke Patients	1018
Bernadus Kristyanto, Brilianta Budi Nugraha, Suyoto Suyoto, Anugrah Kusumo Pamosoaji, and Kristanto Agung Nugroho	

IHSED 7: Human Cyber Physical Systems Interaction Applications	
A Human-in-the-Loop Approach for Energy Flexibility System Integration to Support Infrastructures	1027
Wim Zeiler and Timi Labeodan	
A Survey on Trust in Augmented Human Technologies	1033
Jean-Marc Seigneur, Tareq Ahram, and Redha Taiar	
Are We Designing Cybersecurity to Protect People from Malicious Actors?	1038
Alex Cadzow	
Study on Interaction Modalities Between Humans and CPS in Sociotechnical Systems	1044
Stuart Chapman, Thomas Kirks, and Jana Jost	
Security Design from Ergonomic Perspective: From “Total Security” to “Acceptable Security” Design for a Better Real Security	1051
Ferdinand Monéger, Fabien Coutarel, Motak Ladislav, Patrick Chambres, Marie Izaute, and Michel Dhome	
Ethics as a Security Role	1058
Scott Cadzow	
An Information Management Framework to Industry 4.0: A Lean Thinking Approach	1063
Leonor Teixeira, Carlos Ferreira, and Beatriz Sousa Santos	
Alternative Ensemble Classifier Based on Penalty Strategy for Improving Prediction Accuracy	1070
Cindy-Pamela Lopez, Maritzol Tenemaza, and Edison Loza-Aguirre	
The Effect of Cognitive Load in 3D Virtual Environments	1077
Siao-Wei Huang and Yu-Chen Hsu	
Research on Visual Speech Recognition Based on Local Binary Pattern and Stacked Sparse Autoencoder	1082
Yuanyao Lu, Ke Gu, and Shan He	
A Software Tool for the Calculation of Time Standards by Means of Predetermined Motion Time Systems and Motion Sensing Technology	1088
Jaime León-Duarte, Luis Aguilar-Yocupicio, and Luis Romero-Dessens	
PythaPosi: Indoor Location Estimation with Physics Constraint and Recursive Filtering	1094
Masaaki Ano and Hiroaki Tobita	

IHSED 8: Business, Design and Technology

Becoming Digital – Instruments for SME	1103
Holger Heppner and Katharina Schlicher	
Extracting Customer-Related Information for Need Identification	1108
Antonia Fels, Kristof Briele, Max Ellerich, and Robert Schmitt	
Visualization System Design for the Process of Packaging Egg Powders	1113
Irena Barbara Jałmużna, Jan Królikowski, and Marcin Sadok	
Live Migration Control Method for Ensuring Sustainable Development of e-Learning Environment	1120
Satoshi Togawa and Kazuhide Kanenishi	
Analyzing Design Process - Reflection on 25 Years of Professional Practice	1126
Gonçalo Falcão	
A Research-Based Approach for Higher Education Systems: Nigeria in Perspective	1133
Ifetayo Oluwafemi, Clinton Aigbavboa, Jan-Harm C. Pretorius, and Jesusetemi Oluwafemi	
Survey on the Influence of Managing Strikes, Industrial Manifestation for Industrial Harmony in Nigeria	1139
Ifetayo Oluwafemi, Clinton Aigbavboa, Jan-Harm C. Pretorius, and J. F. Oluwafemi	
Author Index	1147