Intelligent Human Systems Integration

Proceedings of the 1st International Conference on Intelligent Human Systems Integration (IHSI 2018): Integrating People and Intelligent Systems, January 7–9, 2018, Dubai, United Arab Emirates
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Preface

This volume, entitled *Intelligent Human Systems Integration*, aims to provide a global forum for introducing and discussing novel approaches, design tools, methodologies, techniques, and solutions for integrating people with intelligent technologies, automation, and artificial cognitive systems in all areas of human endeavor in industry, economy, government, and education. Some of the notable areas of application include, but are not limited to, energy, transportation, urbanization and infrastructure development, digital manufacturing, social development, human health, sustainability, new generation of service systems, as well as developments in safety, risk assurance, and cybersecurity in both civilian and military contexts. Indeed, rapid progress in developments in the ambient intelligence, including cognitive computing, modeling, and simulation, as well as smart sensor technology, weaves together the human and artificial intelligence and will have a profound effect on the nature of their collaboration at both the individual and societal levels in the near future.

As applications of artificial intelligence and cognitive computing become more prevalent in our daily lives, they also bring new social and economic challenges and opportunities that must be addressed at all levels of the contemporary society. Many of the traditional human jobs that require high levels of physical or cognitive abilities, including human motor skills, reasoning, and decision-making abilities, as well as training capacity, are now being automated. While such trends might boost the economic efficiency, they can also negatively impact the user experience and bring about many unintended social consequences and ethical concerns.

The intelligent human systems integration is to a large extent affected by the forces shaping the nature of future computing and artificial system development. This book discusses the needs and requirements for the symbiotic collaboration between humans and artificially intelligent systems, with due consideration of the software and hardware characteristics allowing for such cooperation from the societal and human-centered design perspectives, with the focus on the design of intelligent products, systems, and services that will revolutionize human–technology interactions.
This book also presents many innovative studies of ambient artificial technology and its applications, including the consideration of human–machine interfaces with a particular emphasis on infusing intelligence into development of technology throughout the lifecycle development process, with due consideration of user experience and the design of interfaces for virtual, augmented, and mixed reality applications of artificial intelligence.

Reflecting on the above-outlined perspective, the papers contained in this volume are organized into five main sections, including:

I. Intelligence, Technology, and Automation
II. Humans and Artificial Cognitive Systems
III. Computational Modeling, Simulation, and Design
IV. Ambient Intelligence and User Experience
V. Society, Governance and Smart Systems

We would like to extend our sincere thanks to Dr. Stefania Camplone, University of Chieti-Pescara, Italy, for leading a part of the technical program that focuses on Smart Materials and Inclusive Human Systems. Our appreciation also goes to the members of Scientific Program Advisory Board who have reviewed the accepted papers that are presented in this volume, including the following individuals:

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We hope that this book, which presents the current state of the art in Intelligent Human Systems Integration, will be a valuable source of both theoretical and applied knowledge enabling the design and applications of a variety of intelligent products, services, and systems for their safe, effective, and pleasurable collaboration with people.

January 2018

Waldemar Karwowski
Tareq Z. Ahram
Contents

Intelligence, Technology and Automation

A Design and Description Method for Human-Autonomy Teaming Systems ............................................. 3
Axel Schulte and Diana Donath

Current Insights in Human Factors of Automated Driving and Future Outlook Towards Tele-Operated Remote Driving Services .............................................................. 10
Christopher D. D. Cabrall, Alexander Eriksson, Zhenji Lu, and Sebastiaan M. Petermeijer

External HMIs and Their Effect on the Interaction Between Pedestrians and Automated Vehicles ........................................ 13
Ye Eun Song, Christian Lehsing, Tanja Fuest, and Klaus Bengler

Attuning the ‘Pedestrian-Vehicle’ and ‘Driver-Vehicle’ - Why Attributing a Mind to a Vehicle Matters .................. 19
Peter Bengtsson

Designing a Proactive Risk Mitigation Environment for Integrated Autonomous Vehicle and Human Infrastructure .................. 23
Caitlin Anne Surakitbanharn

The 4D LINT Model of Function Allocation: Spatial-Temporal Arrangement and Levels of Automation ............................. 29
Christopher D. D. Cabrall, Thomas B. Sheridan, Thomas Prevot, Joost C. F. de Winter, and Riender Happee

Study on Estimation of Driver’s State During Automatic Driving Using Seat Pressure .................................... 35
Kenta Okabe, Keiichi Watanuki, Kazunori Kaede, and Keiichi Muramatsu
Automated Text Detection and Character Recognition in Natural Scenes Based on Local Image Features and Contour Processing Techniques ........................................... 42
Remigiusz Baran, Pavol Partila, and Rafal Wilk

Continuous Model Based System Engineering (MBSE) Improvement via Human System Integration and Customer Change . . . 49
Robert A. Sharples

Injecting Digitized Knowledge into the Technical Support Dialog . . . 55
Don Allen

Artificial Intelligence and Interaction Design for a Positive Emotional User Experience .......................................................... 62
Cristina Caramelo Gomes and Sandra Preto

The Cognitive Airport Signage System Design: Comparative Case Study Between American Airport and Chinese Airport ............. 69
Yan Gan and Zhi Peng Feng

Legal Risks and the Countermeasures of Developing Intelligent Investment Advisor in China ..................................................... 76
Cgeng-yong Liu

Reactive Operation: A Framework for Event Driven Low Voltage Grid Operation ................................................................. 83
Ralf Mosshammer, Konrad Diwold, Alfred Einfalt, and Christoph Groiss

Task Analysis of Diagnostic Ultrasound System Use: Comparison Between Sonographers’ and Physicians’ Use in Different Clinical Applications ................................................... 89
Giuseppe Andreoni, Marco Delpiano, Nicola Guraschi, and Leonardo Forzoni

Evaluation of the Quality of Internet Breast Cancer Information: Fuzzy VIKOR Approach ......................................................... 95
Zuhaira Muhammad Zain

Research on an Improved Fall Detection Algorithm for Elder People ................................................................. 102
Qi Luo

Udara E. Manawadu, Takahiro Kawano, Shingo Murata, Mitsuhiro Kamezaki, and Shigeki Sugano
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Context Query Service Supporting Home Person-Centered Care for Elderly People</td>
<td>112</td>
</tr>
<tr>
<td>Haruhisa Maeda, Sachio Saiki, and Masahide Nakamura</td>
<td></td>
</tr>
<tr>
<td>Significance of Social Factors for Effective Implementation of Smart Energy Management Systems in End-User Households</td>
<td>119</td>
</tr>
<tr>
<td>Jaroslaw Kowalski, Cezary Biele, Marek Mlodozeniec, and Marcel Geers</td>
<td></td>
</tr>
<tr>
<td>“Intelligent Bathroom” - Intelligent Decision for Health</td>
<td>125</td>
</tr>
<tr>
<td>Anna Jaglarz</td>
<td></td>
</tr>
<tr>
<td>Influence of Human Based Factors on Small Neighbourhood vs. Household Energy Load Prediction Modelling</td>
<td>131</td>
</tr>
<tr>
<td>Pawel Kobylinski, Mariusz Wierzbowski, and Cezary Biele</td>
<td></td>
</tr>
<tr>
<td>A Prototype of a Small Tracked Robot for Gas Pipeline Inspection and Maintenance</td>
<td>137</td>
</tr>
<tr>
<td>Wen Zhao, Mitsuhiro Kamezaki, Kento Yoshida, Minoru Konno, Ryoichi Toriumi, and Shigeki Sugano</td>
<td></td>
</tr>
<tr>
<td>Human Activity Detection Patterns: A Pilot Study for Unobtrusive Discovery of Daily Working Routine</td>
<td>143</td>
</tr>
<tr>
<td>Hicham Rifai, Paula Kelly, Yoshiki Shoji, Damon Berry, and Matteo Zallio</td>
<td></td>
</tr>
<tr>
<td>Eye Movements and Lie Detection</td>
<td>149</td>
</tr>
<tr>
<td>Yulia V. Bessonova and Alexander A. Oboznov</td>
<td></td>
</tr>
<tr>
<td>What Are the Benefits of Newly Developed Medical Devices When the User Does not Use Them? – An Investigation of Hearing Aid Use</td>
<td>156</td>
</tr>
<tr>
<td>Verena Wagner-Hartl</td>
<td></td>
</tr>
<tr>
<td>Development of an Active Upper Limb Orthosis Controlled by EMG with Upper Arm Rotation</td>
<td>163</td>
</tr>
<tr>
<td>Akihiko Hanafusa, Fumiya Shiki, Haruki Ishii, Masaki Nagura, Yuji Kubota, Kengo Ohnishi, and Yoshiyuki Shibata</td>
<td></td>
</tr>
<tr>
<td>Humans and Artificial Cognitive Systems</td>
<td></td>
</tr>
<tr>
<td>Design and Experimental Validation of Transparent Behavior for a Workload-Adaptive Cognitive Agent</td>
<td>173</td>
</tr>
<tr>
<td>Yannick Brand, Michael Ebersoldt, Daniel Barber, Jessie Y. C. Chen, and Axel Schulte</td>
<td></td>
</tr>
<tr>
<td>Intelligent Visual Analytics – a Human-Adaptive Approach for Complex and Analytical Tasks</td>
<td>180</td>
</tr>
<tr>
<td>Kawa Nazemi</td>
<td></td>
</tr>
</tbody>
</table>
CPR: Bright Side of Machine-Human Relationship ........................ 191
Shaik Farid Abdull Wahab, Ahmad Rasdan Ismail, and Rohayu Othman

Surface Recalibration as a New Method Improving Gaze-Based Human-Computer Interaction ........................................ 197
Cezary Biele and Pawel Kobylinski

A Bionic Sphincter for Stress Urinary Incontinence: Design and Preliminary Experiments ........................................... 203
Kenana Al Adem, Sarah S. Bawazir, Khulood Alameri, Gioia Lucarini, Tommaso Mazzocchi, Cesare Stefanini, Paolo Dario, and Arianna Menciassi

Experimental Validation of Pilot Situation Awareness Enhancement Through Transparency Design of a Scalable Mixed-Initiative Mission Planner ........................................ 209
Fabian Schmitt, Gunar Roth, Daniel Barber, Jessie Chen, and Axel Schulte

Integrating 3D Facial Model with Person-Centered Care Support System for People with Dementia ................................. 216
Shota Nakatani, Sachio Saiki, and Masahide Nakamura

Integration of Cognitive Cybernetics into Intelligent Human Systems ................................................................. 223
Zdenko Balaž and Davor Predavec

Gaze-Aware Cognitive Assistant for Multiscreen Surveillance ........ 230
Sébastien Tremblay, Daniel Lafond, Cindy Chamberland, Helen M. Hodgetts, and François Vachon

Computerized Brain Interfaces for Adaptive Learning and Assessment ......................................................... 237
Rosa María Arnaldo, Javier Iglesias, Víctor Fernando Gómez, Javier Crespo, Luis Pérez, José Félix Alonso, and Alvaro Rodríguez Sanz

Recognition of Affective States via Electroencephalogram Analysis and Classification ............................................. 242
Abeer Al-Nafjan, Manar Hosny, Yousef Al-Ohali, and Areej Al-Wabil

Non-obtrusive Sleep Detection for Character Computing Profiling .... 249
Alia ElBolock, Rowan Amr, and Slim Abdennadher

Biological and Social Factors that Exert an Impact on Decision Making During Working-Out of the Convergent Technologies .... 255
Evgeny Kolbachev and Tatiana Kolbacheva
Contents

Humans and Color Cognition – Using the Brain to Study Human Behavior .......................... 261
Fernando Moreira da Silva

Assessing the Effect of Care Treatment Using Face Emotional Analysis and Cognitive Computing .................................. 267
Arashi Sako, Sachio Saiki, and Masahide Nakamura

Identify Subconscious Visual Response from Brain Signals .................. 274
H. T. M. A. Riyadh, Jahangir Hossain Bhuyain, Zehara Zebin, Khandaker Tabin Hasan, and A. Z. M. Ehtesham Chowdhury

EEG Analysis from Motor Imagery to Control a Forestry Crane ...... 281
Midhumol Augustian, Shafiq ur Rehman, Axel Sandvig, Thivra Kotikawatte, Mi Yongcui, and Hallvard Roe Evensmoen

Exploring the Usage of EEG and Pupil Diameter to Detect Elicited Valence ........................................ 287
Yasmeen Abdrabou, Khaled Kassem, Jailan Salah, Reem El-Gendy, Mahesty Morsy, Yomna Abdelrahman, and Slim Abdennadher

Integrating Classes from Different Schools Using Intelligent Teacher Support Systems ............................... 294
Roberto Araya

AI Infused Fragrance Systems for Creating Memorable Customer Experience and Venue Brand Engagement .................................. 301
Anitha Ilapakurti, Jaya Shankar Vuppalapati, Santosh Kedari, Sharat Kedari, Rajasekar Vuppalapati, and Chandrasekar Vuppalapati

Will Sketching Survive with the Use of Artificial Intelligence Tools? . . . 308
Ana Moreira da Silva

Research on the Construction of the Hierarchical Classification Model of the Urban Intelligent Lighting Appliance (UILA) Based on User Needs .................................................. 315
Junnan Ye, Jianxin Cheng, Chaoxiang Yang, Zhang Zhang, Xinyu Yang, and Lingyun Yao

Influence of Personal Characteristics and Device Properties on Wearable’s Rank Order ........................................ 321
Thea Radünntz and Uwe Rose

Comparative Analysis of the Quantitative Parameters of the Different Shapes of the Heart in Human Fetuses .................. 327
G. A. Spirina

A Practice of Flight Deck Evaluation in Civil Aircraft ....................... 333
Haiyan Liu, Baofeng Li, Dayong Dong, Hongtao Liu, Zhefeng Jin, and Yinbo Zhang
### Operator Response to Failure of a Computerized Procedure System
Claire Taylor, Michael Hildebrandt, Niav Hughes, and Robert McDonald

#### Human-Human Interaction: A Neglected Field of Study?
Piotr Chyna, Julia Falkowska, and Janusz Sobecki

### Computational Modeling, Simulation and Design

#### Smart Palletisation: Cognitive Ergonomics in Augmented Reality Based Palletising
Veronika Kretschmer, Thorsten Plewan, Gerhard Rinkenauer, and Benedikt Maettig

#### Augmenting the Evaluation and Mapping of Progress in Scientific Research – A Human-Machine Symbiosis Perspective
Andrej Dobrkovic, Daniel A. Döppner, Maria-Eugenia Iacob, and Jos van Hillegersberg

#### Development and Evaluation of a Virtual Reality Grocery Shopping Application Using a Multi-kinect Walking-in-Place Approach
Vix Kemanji Ketoma, Philip Schäfer, and Gerrit Meixner

#### Influence of VR-Based Slope Images on Walking Pattern
Yusuke Osawa, Keiichi Watanuki, Kazunori Kaede, Keiichi Muramatsu, and Norihiro Ishizaka

### The Concept of Narrative as a Fundamental for Human Agent-Based Modeling
Roger A. Parker

#### An Agent Based Model of Saudi Household Electricity Consumption
Yosef Alsuhaibani

#### Digital Human Modelling Method for the Evaluation of the Ultrasound System and Transducer Design Adherence to the SDMS Industry Standards
Giuseppe Andreoni, Carlo Emilio Standoli, Fabio Rezzonico, Luis Rojas, and Leonardo Forzoni

#### UX Design in the Localization and Internationalization of NASA’s Eyes on the Earth
Lamees Alsuhaibani, Amal Alabdulkarim, Kevin Hussey, and Areej Al-Wabil
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Media Art Utilizing Traditional Animation Digital Video Expression Using Projection Mapping and Multi Screen Technique</td>
<td>408</td>
</tr>
<tr>
<td>Zhipeng Feng and Kiyoshi Tomimatsu</td>
<td></td>
</tr>
<tr>
<td>Guidance of Enterprise Team Division Based on Security Awareness and Interaction</td>
<td>414</td>
</tr>
<tr>
<td>Yun-lu Zhang and Xue-bo Chen</td>
<td></td>
</tr>
<tr>
<td>Applying Process Mining Techniques to Learning Management Systems for Educational Process Model Discovery and Analysis</td>
<td>420</td>
</tr>
<tr>
<td>Darko Etinger, Tihomir Orehovački, and Snježana Babić</td>
<td></td>
</tr>
<tr>
<td>Explorations into Deep Learning Mobile Applications</td>
<td>426</td>
</tr>
<tr>
<td>Alisa Krstova, Alek Petreski, and Sonja Gievska</td>
<td></td>
</tr>
<tr>
<td>Theoretical Propositions and Practical Implementation of the Formalization of Structured Knowledge of the Subject Area for Exploratory Research</td>
<td>432</td>
</tr>
<tr>
<td>Olga Popova, Yury Shevtsov, Boris Popov, Vladimir Karandey, and Vladimir Klyuchko</td>
<td></td>
</tr>
<tr>
<td>Bayesian Network Construction and Simplified Inference Method Based on Causal Chains</td>
<td>438</td>
</tr>
<tr>
<td>Yohei Ueda, Daisuke Ide, and Masaomi Kimura</td>
<td></td>
</tr>
<tr>
<td>Image Super Resolution Using Wavelet Transformation and Swarm Optimization Algorithm</td>
<td>444</td>
</tr>
<tr>
<td>Gunamani Jena, Sudam Sekhar Panda, Bonam Venkata Rajesh, and Subhashish Jena</td>
<td></td>
</tr>
<tr>
<td>Human Posture Tracking System for Industrial Process Design and Assessment</td>
<td>450</td>
</tr>
<tr>
<td>Francesco Caputo, Egidio D’Amato, Alessandro Greco, Immacolata Notaro, and Stefania Spada</td>
<td></td>
</tr>
<tr>
<td>Instrumentation of an External Fixator for Force and Bone Healing Process Monitoring</td>
<td>456</td>
</tr>
<tr>
<td>Fatima Ba Fakih, Cesare Stefanini, Paolo Dario, and Stefano Mazzoleni</td>
<td></td>
</tr>
<tr>
<td>Study of Visual Symbols Used in Food Packaging Identification for the Elderly Affected with Chronic Diseases</td>
<td>462</td>
</tr>
<tr>
<td>Jiajie Lyu and Delai Men</td>
<td></td>
</tr>
<tr>
<td>Research of a Falling Detection System for the Elderly Based on Three-Dimensional Acceleration</td>
<td>469</td>
</tr>
<tr>
<td>Qi Luo</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>A Qualitative Model to Estimate Users’ Fear of Environmental...</td>
<td>473</td>
</tr>
<tr>
<td>Conditions for Evacuation Route Guidance</td>
<td></td>
</tr>
<tr>
<td>Hiroshi Furukawa and Zhihuan Liu</td>
<td></td>
</tr>
<tr>
<td>The Effects of Enterprise Staff Safety Consciousness Based...</td>
<td>480</td>
</tr>
<tr>
<td>on Cellular Automata Model</td>
<td></td>
</tr>
<tr>
<td>Min Yang and Xue-Bo Chen</td>
<td></td>
</tr>
<tr>
<td>Machine-Man-Task System Approach and NR-17</td>
<td>487</td>
</tr>
<tr>
<td>Regulatory Standard</td>
<td></td>
</tr>
<tr>
<td>Norma de Melo Pinto and Kazuo Hatakeyama</td>
<td></td>
</tr>
<tr>
<td>Ambient Intelligence and User Experience</td>
<td></td>
</tr>
<tr>
<td>User Centered Ecological Interface Design (UCEID): A Novel Method...</td>
<td>495</td>
</tr>
<tr>
<td>Applied to the Problem of Safe and User-Friendly Interaction...</td>
<td></td>
</tr>
<tr>
<td>Kirsten Revell, Pat Langdon, Mike Bradley, Ioannis Politis, ...</td>
<td></td>
</tr>
<tr>
<td>James Brown, and Neville Stanton</td>
<td></td>
</tr>
<tr>
<td>Statistics-IDE: Supporting the Design of Empirical Experiments...</td>
<td>502</td>
</tr>
<tr>
<td>for Non-experts During Early Stages of Research Projects</td>
<td></td>
</tr>
<tr>
<td>Frode Eika Sandnes and Evelyn Eika</td>
<td></td>
</tr>
<tr>
<td>Measuring User Experience of Seniors in Battery...</td>
<td>508</td>
</tr>
<tr>
<td>Swapping Interactions</td>
<td></td>
</tr>
<tr>
<td>Fei-Hui Huang</td>
<td></td>
</tr>
<tr>
<td>Web Page Graphic Design Usability Testing Enhanced with Eye-Tracking</td>
<td>515</td>
</tr>
<tr>
<td>Piotr Chynał, Julia Falkowska, and Janusz Sobecki</td>
<td></td>
</tr>
<tr>
<td>Preliminary Research on Competency Model for High Plateau...</td>
<td>521</td>
</tr>
<tr>
<td>Airline Pilots</td>
<td></td>
</tr>
<tr>
<td>Qi Luo</td>
<td></td>
</tr>
<tr>
<td>User Interface Design in Remote Aerodrome Flight...</td>
<td>526</td>
</tr>
<tr>
<td>Information Service</td>
<td></td>
</tr>
<tr>
<td>Shoka Nagata, Kazuhiko Yamazaki, and Satoru Inoue</td>
<td></td>
</tr>
<tr>
<td>The Robot Brain Server: Design of a Human-Artificial Systems...</td>
<td>531</td>
</tr>
<tr>
<td>Partnership</td>
<td></td>
</tr>
<tr>
<td>Johan F. Hoorn</td>
<td></td>
</tr>
<tr>
<td>Act like a Human: Teach an Autonomous Vehicle to Deal with Traffic...</td>
<td>537</td>
</tr>
<tr>
<td>Encounters</td>
<td></td>
</tr>
<tr>
<td>Jianmin Wang, Jiawei Lu, Fang You, and Yujia Wang</td>
<td></td>
</tr>
<tr>
<td>Design Approach for Sanpoyoshi Principle and Case Study</td>
<td>543</td>
</tr>
<tr>
<td>Kazuhiko Yamazaki</td>
<td></td>
</tr>
</tbody>
</table>
Identifying Significance of Human Cognition in Future Maintenance Operations ........................................ 550
Prasanna Illankoon, Phillip Tretten, and Uday Kumar

Collaborative Human-Machine Interaction in Mobile Phone Support Centers: A Case Study .................. 557
Kyle Dent, Luke Plurkowski, and John Maxwell

Crew Resource Management Doctrine Applicability to Human-Machine Interaction in Commercial Aircraft .............. 564
Aysen K. Taylor

The Role of Monitoring and Evaluation in Construction Project Management ............................................. 571
Tengan Callistus and Aigbavboa Clinton

Transformations in Mass Society and Emergent Properties of Human Behavior in Contemporary Media Space ................ 583
Dobrinka Peicheva, Lilia Raycheva, Valentina Milenkova, and Boris Manov

Modelling the Perceived Pragmatic and Hedonic Quality of Intelligent Personal Assistants ...................... 589
Tihomir Orehovački, Snježana Babić, and Darko Etinger

The Brave New E-world of the Human-Centered Media Ecosystem .......................................................... 595
Lilia Raycheva and Dobrinka Peicheva

Identification of Visually Impaired Person with Deep Learning ............. 601
Shoichiro Fujisawa, Ranmaru Mandai, Ryota Kurozumi, Shin-ichi Ito, and Katsuya Sato

The Role of Mental Model in Graphical Password Selection and Design .............................................. 608
Mona A. Mohamed, Joyram Chakraborty, and Josh Dehlinger

Tablets and Smart Glasses in Modern Production Environments – A Lab Study on Distracted Walking ................. 614
Patricia Tegtmeier and Sascha Wischniewski

A Perception Study of a New Set of Usability Heuristics for Transactional Web Sites ........................................ 620
Freddy Paz, Freddy A. Paz, Juan Jesús Arenas, and Carmen Rosas

On User eXperience Evaluation: Combining User Tests and Psychometrics ................................................... 626
Virginia Zaraza Rusu, Cristian Rusu, Pablo Cáceres, Virginica Rusu, Daniela Quiñones, and Patricia Muñoz
Research on Parent-Child Interaction System of Intelligent Children’s Furniture Based on Application Behavior Analysis ................................. 633
Ting Deng, Wei Sun, and Ruiqiu Zhang

Adaptive Edge Analytics - A Framework to Improve Performance and Prognostics Capabilities for Dairy IoT Sensor ........................................ 639
Santosh Kedari, Jaya Shankar Vuppalapati, Anitha Ialapakurti, Sharat Kedari, Rajasekar Vuppalapati, and Chandrasekar Vuppalapati

Evaluation of Legibility and Visual Fatigue Caused by Luminescent Text Displays .................................................................................. 646
Daiki Saito, Keiichi Watanuki, Keiichi Muramatsu, Kazunori Kaede, Masutsugu Tasaki, Takashi Kanahira, Eiji Ishiguro, and Naoya Mashiko

Multimodal Interactive Payment Based on Biometrics ........................................ 652
Shuxian Liu and Huaming Peng

Re-modeling the ‘Phonebook’ in a Smart Phone: Personalization Based on Intimacy and Immediacy .......................................................... 659
Ravi Mokashi Punekar, Shivani Holkar, and Abhishek Yevalkar

Society, Governance and Smart Systems

Smart Shopping Experience. New Materials and Technologies for Social Inclusion Through Daily Activities ............................................... 667
Stefania Camplone and Giuseppe Di Bucchianico

Next Smart Design: Inclusion, Emotions, Interaction in the Concept of Baby Soothing, Caring and Monitoring
Smart Solutions ....................................................................................... 673
Marinella Ferrara and Anna Cecilia Russo

Applied Semiotics in the Context of Open Government Data (OGD) Portals in the Arab Gulf ................................................................. 680
Furat Aljishi, Arwa Alsaati, Areej Al-Wabil, and Anas Alfaris

Cyclotourism and Social Inclusion: From Service to Product for a Smart Extra-Urban Bike Sharing ......................................................... 686
Ivo Spitilli, Stefania Camplone, Giuseppe Di Bucchianico, and Antonio Marano

Service System-Based Urban Mobility System Design for Chinese Metropolis .......................................................... 693
Jintian Shi and Xiaohua Sun

Smart Cities-Smart Societies ..................................................................... 700
Gianmarco Cifaldi and Ionut Serban
Contents

City of Future ....................................................... 708
Fabrizio Fornari

Between a Smart City and Smart Society ........................ 714
Gianmarco Cifaldi and Ionut Serban

Hemp for a Healthy and Sustainable Building in Abruzzo .......... 720
Donatella Radogna, Luciana Mastroilonardo, and M. Cristina Forlani

The Creative Space of University as a Cognitive-Generative System ........................................ 727
Alexander O. Karpov

The Emotional Side of Smartness: Intelligent Materials and Everyday Aesthetics ............................................. 733
Anna Cecilia Russo

Mapping ICS Materials: Interactive, Connected, and Smart Materials ........................................ 739
Stefano Parisi, Davide Spallazzo, Venere Ferraro, Marinella Ferrara, Mauro Attilio Ceconello, Camilo Ayala Garcia, and Valentina Rognoli

Bio-smart Materials: The Binomial of the Future ................. 745
Sabrina Lucibello, Marinella Ferrara, Carla Langella, Cecilia Cecchini, and Rossana Carullo

Exploring Scenarios for ICS Materials in the Yacht Design Framework .................................................. 751
Arianna Bionda and Andrea Ratti

Advanced Materials Empowering Inclusive Engineering Design Processes ........................................ 757
Micol Costi and Emilio Genovesi

Interactive, Connected, Smart materials: ICS materiality ........ 763
Marinella Ferrara, Valentina Rognoli, Venanzio Arquilla, and Stefano Parisi

Study of the Ergonomics Applied to the Reuse and Recycling of Materials ........................................ 770
Hebert Robert da Silva

Author Index ............................................................. 777