IHSI
International
Intelligent Human
Systems Integration
Conference
2019
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2019
IHSI
International

2nd International Conference on
Intelligent Human Systems Integration:
Integrating People and Intelligent Systems

Final Program

February 7-10, 2019
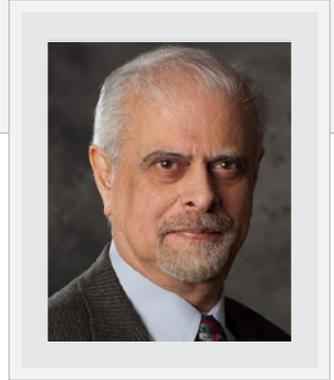### Hilton San Diego Bayfront
California, USA

www.ihsint.org

Date: February 8, 2019
16:30-18:00, Indigo Ballroom A (First Level)

Adaptive Cyber-Physical-Human Systems: A 21st Century Perspective

Professor Azad M. Madni
Executive Director,
University of Southern California

Abstract

The 21st century has seen the emergence of a special class of tightly coupled intelligent human-machine systems that the DoD has labeled "next generation adaptive cyber-physical-human systems." My talk will introduce this exciting new class of human-machine systems, the research challenges it poses, and ongoing research in this area. Examples of adaptive cyber-physical-human systems range from very small systems such as medical devices to larger systems such as self-driving cars and unmanned aerial vehicles to very large systems such as smart manufacturing, smart buildings and autonomous systems networks. Adaptive cyber-physical-human systems are a class of safety-critical socio-technical systems in which interactions between the physical system and cyber elements that control its operation are influenced by human agents and need to respond to both systemic and external disruptions. These systems are introducing new challenges in intelligent human-systems integration that cannot be effectively addressed by current methods and tools. These challenges include tight coupling, complex human-system interaction, the need for maintaining shared context during joint task performance, and the need for bi-directional decision and knowledge support to eliminate human oversight and reduce human error. Developing such systems requires expertise in multiple disciplines such as human factors, cognitive psychology, software engineering, artificial intelligence, machine learning, and intelligent human-systems integration. A real-world example and prototype implementation of such a system will be discussed. The talk will conclude with a vision for transdisciplinary systems engineering that capitalizes on multiple disciplines to address intelligent human-systems integration challenges of the 21st century.

About the speaker

Dr. Azad Madni is the Executive Director of University of Southern California's Systems Architecting and Engineering Program, and a Professor of Astronautics in USC's Viterbi School of Engineering. He has a courtesy appointment in USC's Keck School of Medicine and Rossier School of education. He is the founder and CEO of Intelligent Systems Technology Inc., a high-tech R&D company specializing in advancing the state-of-the-art in intelligent systems engineering using cross-disciplinary approaches. He received his BS, MS, and PhD degrees in Engineering from UCLA. His research on intelligent systems, human-systems integration, and integration of humans with adaptive systems has been sponsored by DoD, aerospace and automotive companies. His research sponsors include DOD-SERC, DARPA, OSD, MDA, AFOSR, AFRL, ONR, NAVAIR, NAVSEA,

SPAWAR, MARCOR, ARL, RDECOM, DTRA, DOE, DOT, NIST, NASA, Boeing, General Motors, Raytheon, Northrop Grumman, Orincon, and SAIC. He has received numerous awards and honors including the 2011 INCOSE Pioneer Award. He is an elected Fellow of IEEE (Life), AIAA, INCOSE, AAAS, IETE (Life), and SDPS (Life). In 2016, Boeing honored him with a Lifetime Achievement Award and a Visionary Systems Engineering Leadership Award for his impact on Boeing, the aerospace industry and the nation. He is the author of Transdisciplinary Systems Engineering: Exploiting Convergence in a Hyper-Connected World (Springer 2019), and co-author of Tradeoff Decisions in System Design (Springer 2016). He is the co-Editor-in-Chief of two books, "Engineered Resilient Systems: Challenges and Opportunities in the 21st Century," Procedia Computer Science 28 (Elsevier, 2014), and Disciplinary Convergence in Systems Engineering Research (Springer, 2019). He is the co-founder and Chair of the award-winning IEEE SMC Technical Committee on Model Based Systems Engineering. He has served as organizer and General Chair of the Conference on Systems Engineering Research (CSER) since 2008. His research interests include intelligent cyber-physical-human systems, formal methods for complex systems engineering, autonomous systems, model-based systems engineering, and interactive model-driven storytelling for engineering complex systems and system-of-systems.
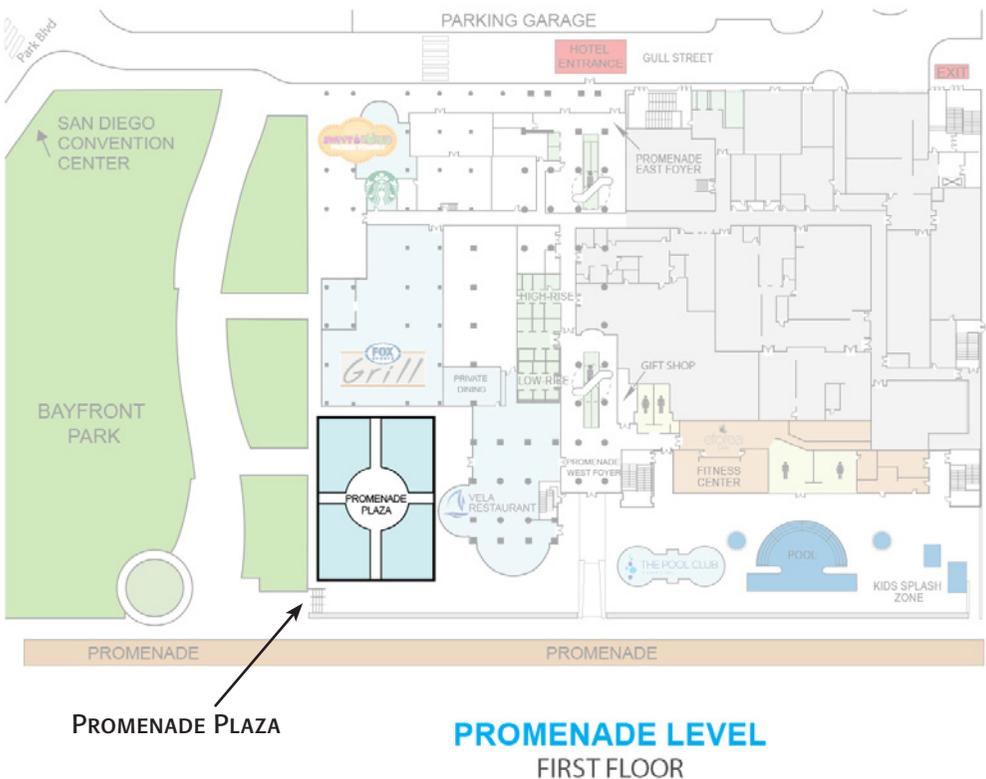
Conference Reception/Banquet
February 8, 2019 at 18:00 - 22:00
Promenade Plaza (Lobby Level), Hilton San Diego Bayfront
Address: Hilton San Diego Bayfront, One Park Blvd. San Diego, CA 92101 USA

(Dress is business casual, Registered Participants, Photo ID Required)

Promenade Plaza

PROMENADE LEVEL
FIRST FLOOR

ACRONYM	TRACK
IHSI 1	Humans and Artificial Cognitive Systems
IHSI 2	Intelligence, Technology and Automation
IHSI 3	Computational Modeling and Simulation
IHSI 4	Humans and Artificial Systems Complexity
IHSI 5	Smart Materials and Inclusive Human Systems
IHSI 6	Human-Autonomy Teaming
IHSI 7	Applications and Future Trends

Friday, February 8

#	TITLE	ROOM	TRACK
	Keynote Address: Adaptive Cyber-Physical-Human Systems: A 21st Century Perspective Speaker: Professor Azad M. Madni	Indigo Ballroom	ALL

Saturday, February 9

#	TITLE	ROOM	TRACK
	Session Time: 8:30 - 10:30		
1	IHSI 1: Humans and Artificial Cognitive Systems I	Sapphire 410 A	IHSI 1
2	IHSI 2: Intelligence, Technology and Analytics I	Sapphire 410 B	IHSI 2
3	IHSI 3: Computational Modeling and Simulation I	Sapphire 411 A	IHSI 3
4	IHSI 4: Humans and Artificial Systems Complexity I	Sapphire 411 B	IHSI 4
	10:30 - 11:00 • Coffee Break - Refreshments will be provided		
	Session Time: 11:00 - 13:00		
5	IHSI 5: Smart Materials and Inclusive Human Systems I	Sapphire 410 A	IHSI 5
6	IHSI 6: Human-Autonomy Teaming I	Sapphire 410 B	IHSI 6
7	IHSI 7: Applications and Future Trends I	Sapphire 411 A	IHSI 7
8	IHSI 1: Humans and Artificial Cognitive Systems II	Sapphire 411 B	IHSI 1
	13:00 - 14:00 • Lunch Break		

Conference at a Glance

#	Title	Room	Track
	Session Time: 14:00 -16:00		
9	IHSI 2: Intelligence, Technology and Analytics II	Sapphire 410 A	IHSI 2
10	IHSI 3: Computational Modeling and Simulation II	Sapphire 410 B	IHSI 3
11	IHSI 4: Humans and Artificial Systems Complexity II	Sapphire 411 A	IHSI 4
12	IHSI 5: Smart Materials and Inclusive Human Systems II	Sapphire 411 B	IHSI 5
	16:00 - 16:30 • Coffee Break - Refreshments will be provided		
	Session Time: 16:30 -18:30		
13	IHSI 6: Human-Autonomy Teaming II	Sapphire 410 A	IHSI 6
14	IHSI 7: Applications and Future Trends II	Sapphire 410 B	IHSI 7
15	IHSI 1: Humans and Artificial Cognitive Systems III	Sapphire 411 A	IHSI 1
16	IHSI 2: Intelligence, Technology and Analytics III	Sapphire 411 B	IHSI 2

Sunday, February 10

#	Title	Room	Track
	Session Time: 8:30 - 10:30		
17	IHSI 3: Computational Modeling and Simulation III	Sapphire 410 A	IHSI 3
19	IHSI 5: Smart Materials and Inclusive Human Systems III	Sapphire 411 A	IHSI 5
20	IHSI 6: Human-Autonomy Teaming III	Sapphire 411 B	IHSI 6
	10:30 - 11:00 • Coffee Break - Refreshments will be provided		
	Session Time: 11:00 - 13:00		
21	IHSI 7: Applications and Future Trends III	Sapphire 410 A	IHSI 7
22	IHSI 1: Humans and Artificial Cognitive Systems IV	Sapphire 410 B	IHSI 1
23	IHSI 2: Intelligence, Technology and Analytics IV	Sapphire 411 A	IHSI 2
	13:00 - 14:00 • Lunch Break		
	Session Time: 14:00 -16:00		
26	IHSI 7: Applications and Future Trends IV	Sapphire 410 B	IHSI 7
27	IHSI 1: Humans and Artificial Cognitive Systems V	Sapphire 411 A	IHSI 1
28	IHSI 2: Intelligence, Technology and Analytics V	Sapphire 411 B	IHSI 2
	16:00 - 16:30 • Coffee Break - Refreshments will be provided		
	Session Time: 16:30 -18:30		
31	IHSI 7: Applications and Future Trends V	Sapphire 410 B	IHSI 7
32	IHSI 1: Humans and Artificial Cognitive Systems VI	Sapphire 411 A	IHSI 1

1	**IHSI 1: Humans and Artificial Cognitive Systems I** Co-Chairs: Jae Woong Lee, USA and Manfred Bornewasser, Germany

8:30 - 10:30 - SAPPHIRE 410 A

Context awareness computing in smart spaces using stochastic analysis of sensor data
> Jaewoong Lee, Sumi Helal, United States

A new method for classification of hazardous driver states based on vehicle kinematics and physiological signals
> Mickael Aghajarian, Ali Darzi, John E. Mcinroy, Domen Novak, United States

Engineering better ethics into human and artificial cognitive systems
> John Celona, United States

A strain based model for adaptive regulation of cognitive assistance systems – theoretical framework and practical limitations
> Dominic Bläsing, Manfred Bornewasser, Germany

Pupil size as input data to distinguish comprehension state in auditory word association task using machine learning
> Kosei Minami, Keiichi Watanuki, Kazunori Kaede, Keiichi Muramatsu, Japan

2	**IHSI 2: Intelligence, Technology and Analytics I** Co-Chairs: Garrett Wampole, USA and Ralf Mosshammer, Austria

8:30 - 10:30 - SAPPHIRE 410 B

Breaking down barriers to collaboration in military satellite systems
> Garrett Wampole, David Campbell, United States

Improving cyber situation awareness by building trust in analytics
> Margaret Cunningham, Dalwinderjeet Kular, United States

Bifrost: A smart city planning and simulation tool
> Ralf Mosshammer, Alfred Einfalt, Konrad Diwold, Julian Schwarz,
> Benjamin Zehrfeldt, Austria

Stochastic drop of kernel windows for improved generalization in convolution neural networks
> Sangwon Lee, Gil-Jin Jang, South Korea

Challenge of tacit knowledge in acquiring information in cognitive mimetics
> Pertti Saariluoma, Antero Karvonen, Mikael Wahlström, Kai Happonen,
> Tuomo Kujala, Ronny Puustinen, Finland

Building on water: The use of satellite images to track urban changes and hydrodynamic models to simulate flow patterns around artificial islands
> Mohamed El Amrousi, Mohamed Elhakeem, Evan Paleologos,
> United Arab Emirates

3	**IHSI 3: Computational Modeling and Simulation I** Co-Chairs: Ryan Mullins, USA and Hyunjeong Kim, South Korea

8:30 - 10:30 - SAPPHIRE 411 A

The civil affairs information matrix: Designing context-aware visual analytics enabling mission planning with ensemble learning
> Ryan Mullins, Ben Ford, Lynndee Kemmet, Shana Weissman, United States

VR experience from data science point of view: How to measure inter-subject dependence in visual attention and spatial behavior
> Pawel Kobylinski, Grzegorz Pochwatko, Cezary Biele, Poland

Mixed reality-based platform for autonomous vehicle cockpit design
> Xiaohua Sun, Shiyu Wu, Shengchen Zhang, Hanlin Wang, China

Effects of simulator sickness and emotional responses when inter-pupillary distance misalignment occurs
> Hyunjeong Kim, Ji Hyung Park, South Korea

Development of a scanning support system using augmented reality for 3d environment model reconstruction
> Yuki Harazono, Hirotake Ishii, Hiroshi Shimoda, Yuya Kouda, Japan

Use of virtual and augmented reality as tools for visualization of information: A systematic review
> Alexandre Cardoso, Mauricio Jose Aureliano Junior, Gabriel Fernandes Cyrino,
> Jose Correa Viana, Edgard Afonso Lamounier, Pedro A. M. T. Almeida, Brazil

4	**IHSI 4: Humans and Artificial Systems Complexity I** Co-Chairs: Frank Flemisch, Germany and Daniela Ströckl, Austria

8:30 - 10:30 - SAPPHIRE 411 B

Making HSI more intelligent: Human systems exploration versus experiment for the integration of humans and artificial cognitive systems
> Frank Flemisch, Marcel Baltzer, Shadan Sadeghian, Ronald Meyer, Daniel López Hernández, Ralph Baier, Germany

Model-based multi-modal human-system interaction
> Daniela Elisabeth Ströckl, Heinrich C. Mayr, Austria

Exploring the acceptance of video-based medical support
> Carsten Roecker, Germany

A model driven development approach using AADL and code generation to develop modular distributed electronic travel aid systems
> Florian Von Zabiensky, Michael Kreutzer, Diethelm Bienhaus, Germany

Intelligent systems in everyday work practices: Integrations and sociotechnical calibrations
> Christine Wolf, Jeanette Blomberg, United States

Envisioning utopia for human-artificial systems aimed at solving vexing societal problems
> Lee Boot, Yelena Yesha, United States

An intelligent tool to facilitate home building: U-Design
> Neda Khakpour, Edwina Popa, Jose Luis Lamuno, Syeda Zaidi, Bao Truong, Ebru Cankaya, United States

10:30 - 11:00 • Coffee Break - Refreshments will be provided

5	**IHSI 5: Smart Materials and Inclusive Human Systems I** Co-Chairs: Felix Oberhofer, Germany and Marinella Ferrara, Italy

11:00 - 13:00 - SAPPHIRE 410 A

Approach to a design guideline regarding the interaction of shape memory alloys and fused deposition modeling
> Felix Oberhofer, Andrea Hein, Daniel Holder, Thomas Maier, Germany

A material database framework to support the design of shape-changing products
> Marius Hölter, Agnese Piselli, Sara Colombo, Barbara Del Curto, Italy

Approaches to digital manufacturing: Designing through materials
> Caterina Dastoli, Patrizia Bolzan, Massimo Bianchini, Barbara Del Curto, Stefano Maffei, Italy

Bio-smart materials for product design innovation: Going through qualities and applications
> Marinella Ferrara, Carla Langella, Sabrina Lucibello, Italy

Adaptive structures and systems: Interaction of application, passive and active structure
> Andrea Hein, Daniel Holder, Thomas Maier, Germany

6	**IHSI 6: Human-Autonomy Teaming I** Co-Chairs: Axel Schulte, Germany and Stephanie Kane, USA

11:00 - 13:00 - SAPPHIRE 410 B

Interaction concept for mixed-initiative mission planning on multiple delegation levels in multi-UCAV fighter missions
> Felix Heilemann, Axel Schulte, Germany

Development of an autonomous manager for dyadic human-machine teams in an applied multitasking surveillance environment
> Mary Frame, Alan Boydstun, Anna Maresca, Jennifer Lopez, United States

Crossing the Uncanny valley of human-system teaming
> Nathan Schurr, Jared Freeman, Daniel Serfaty, Adam Fouse, United States

Investigating compliance in human-robot teaming
> Kelly Satterfield, Victor Finomore, Vincent Mancuso, Joseph Lyons, Ewart De Visser, Kerstin Haring, Sarah Pruznick, Ariana Mosely, Gregory Funke, United States

Hierarchical Planning Guided by genetic algorithms for multiple HAPS in a time-varying environment
> Jane Jean Kiam, Valerie Hehtke, Eva Besada Portas, Axel Schulte, Germany

Towards Effective Human-machine teaming with long duration autonomy
> Stephanie Kane, Drew Housten, United States

7	**IHSI 7: Applications and Future Trends I** Co-Chairs: Stuart White II, USA and Lee Ostrom, USA

11:00 - 13:00 - SAPPHIRE 411 A

Integrating people and intelligent systems by design
> Alana Nicastro, Stuart White, United States

Risk of future technologies
> Lee Ostrom, United States

Adaptation of assistant based speech recognition to new domains and its acceptance by air traffic controllers
> Matthias Kleinert, Hartmut Helmke, Gerald Siol, Heiko Ehr, Dietrich Klakow, Mittul Singh, Petr Motlicek, Christian Kern, Aneta Cerna, Petr Hlousek, Germany

From the Simulator to the Road – Realisation of an in-vehicle interface to support fuel-efficient eco-driving
> Craig Allison, James Fleming, Xingda Yan, Neville Stanton, Roberto Lot, United Kingdom

Meeting students' academic needs with robot tutor: Ms. An - A socially adaptive robot tutor for student engagement in math education
> Karina Liles, United States

Lane change prediction using an echo state network
> Karoline Griesbach, Karl Heinz Hoffmann, Matthias Beggiato, Germany

8	**IHSI 1: Humans and Artificial Cognitive Systems II** Co-Chairs: Robert Manthey, Germany and Tessa Sarnow, Germany

11:00 - 13:00 - SAPPHIRE 411 B

Hexagonal image generation by virtual multi-grid-camera
> Robert Manthey, Danny Kowerko, Germany

Augmented reality in order picking - boon and bane of information (over-) availability
> Ralf Elbert, Tessa Sarnow, Germany

Classification of different cognitive and affective states in computer game players using physiology, performance and intrinsic factors
> Ali Darzi, Trent Wondra, Sean Mccrea, Domen Novak, United States

Research on product color design under the cognition of brand image
> Xin-Xin Zhang, Ming-Gang Yang, Xinying Wu, China

Study on gait discrimination method by deep learning for biofeedback training optimized for individuals
> Yusuke Osawa, Keiichi Watanuki, Kazunori Kaede, Keiichi Muramatsu, Japan

13:00 - 14:00 • Lunch Break •

9	**IHSI 2: Intelligence, Technology and Analytics II** Co-Chairs: Francesco Leali, Italy and Alberto Vergnano, Italy

14:00 -16:00 - SAPPHIRE 410 A

Toward clarifying human information processing: A case study of big data analysis in education
> Keiko Tsujioka, Japan

Population Healthcare AI (PopHealthAI) - The role of geospatial infused electronic health records in creating the next generation preventive healthcare
> Chandrasekar Vuppalapati, Anitha Ilapakurti, Sharat Kedari, Santosh Kedari, Jaya Shankar Vuppalapati, Rajasekar Vuppalapati, United States

The influence of illuminance and color temperature on target dragging task based on eye-control technique
> Yingwei Zhou, Tuoyang Zhou, Yuting Zhao, Haixiao Liu, Chi Zhang, Dan Wang, Jinshou Shi, Chuang Ma, Xin Wang, Xiai Wang, Jianwei Niu, China

Correlation of driver head posture and trapezius muscle activity as comfort assessment of car seat
> Alberto Vergnano, Francesco Pegreffi, Francesco Leali, Italy

Out of position driver monitoring from seat pressure in dynamic maneuvers
> Alberto Vergnano, Francesco Leali, Italy

10	**IHSI 3: Computational Modeling and Simulation II** Co-Chairs: Adam Fouse, USA and Kim Schmidt, Germany

14:00 -16:00 - SAPPHIRE 410 B

Ubiquitous and context-aware computing modelling: Study of devices integration in their environment
    Francisco Gregorio, Vítor Santos, Portugal

Aligning teams to the future: adapting human-machine teams via free energy
    Adam Fouse, Georgiy Levchuk, Nathan Schurr, Robert Mccormack, Krishna Pattipati, Daniel Serfaty, United States

Modified Baum Welch Algorithm for Hidden Markov Models with known structure
    Kim Schmidt, Karl Heinz Hoffmann, Germany

Input data dimensionality reduction of abnormality diagnosis model for nuclear power plants
    Jae Min Kim, Gyumin Lee, Suckwon Hong, Seung Jun Lee, South Korea

Research on aesthetic cognition characteristics of product form: Case study of purple clay teapot
    Ming Li, Jie Zhang, Yiping Hou, Mi Tian, China

Personalized product recommendation for interactive media
    Hal Cooper, Garud Iyengar, Ching-Yung Lin, United States

11	**IHSI 4: Humans and Artificial Systems Complexity II** Co-Chairs: Aappo Kontu, Finland and Eric Owusu, USA

14:00 - 16:00 - SAPPHIRE 411 A

Sustainable competitive advantages in the industrial service business
    Aappo Kontu, Jussi Kantola, Hannu Vanharanta, Kaisa Kontu, Finland

Usability impact of user perceptions in mHealth - The case of Ghanaian migrants
    Eric Owusu, Joyram Chakraborty, United States

Design methodologies for human-artificial systems design: An automotive AR-HUD Design case study
    Cuiqiong Cheng, Fang You, Preben Hansen, Jianmin Wang, China

Research on game incentive strategy design of automated driving takeover system
    Zhelin Li, Shanxiao Jiang, Yu Zhang, Lijun Jiang, Xiaohua Li, Zhiyong Xiong, China

The relationship among the optical aspects of photographic composition and the quality, perception and interpretation of the realism in virtual images
    Marcia Campos, Fabio Campos, Marnix Van Gisbergen, Michelle Kovacs, Brazil

Design pattern as an effective method for designing interactions connecting human and social robots
    Ke Ma, Jing Cao, China

Developing intelligent multimodal IVI systems to reduce driver distraction
    Ahmed Farooq, Grigori Evreinov, Roope Raisamo, Arto Hippula, Finland

12	**IHSI 5: Smart Materials and Inclusive Human Systems II** Co-Chairs: Giuseppe Di Bucchianico, Italy and Andrea Ratti, Italy

14:00 - 16:00 - SAPPHIRE 411 B

Materials for design. An experience of symbolic/communicative characterization
    Stefania Camplone, Giuseppe Di Bucchianico, Ivo Spitilli, Italy

Design for ICS materials: a tentative methodology for interactive, connected, and smart materials applied to yacht design
    Stefano Parisi, Arianna Bionda, Andrea Ratti, Valentina Rognoli, Italy

Augmented materials for tangible interfaces: Experimenting with young designers, outcomes and analysis
    Marinella Ferrara, Anna Cecilia Russo, Italy

Electronic systems designed to guide visually impaired people in public areas: Importance of environmental audio description
    Eliete Mariani, Jaldomir Da Silva Filho, Brazil

Cross-fertilization to innovate the guitar design
    Antonio Marano, Italy

16:00 - 16:30 • Coffee Break - Refreshments will be provided

13	**IHSI 6: Human-Autonomy Teaming II** Co-Chairs: Heather Oonk, USA and Fabian Honecker, Germany

16:30 -18:30 - SAPPHIRE 410 A

Can intelligent agent improve human-machine team performance under cyberattacks?
> Wen Ding, Sonwoo Kim, Daniel Xu, Inki Kim, United States

Full-Mission Human-in-the-Loop experiments to evaluate an automatic activity determination system for adaptive automation
> Fabian Honecker, Axel Schulte, Germany

Developing a context framework to support appropriate trust and implementation of automation
> Sabrina Moran, Heather Oonk, Petra Alfred, John Gwynne, Martin Eilders, United States

An exploratory analysis of physiological data aiming to support an assistant system for helicopter crews
> Matthew Masters, Diana Donath, Axel Schulte, United States

Does the type of visualization influence the mode of cognitive control in a dynamic system?
> Christine Chauvin, Farida Said, Sabine Langlois, France

14	**IHSI 7: Applications and Future Trends II** Co-Chairs: Laura Varisco, Italy and Milica Pavlovic, Italy

16:30 -18:30 - SAPPHIRE 410 B

Designing with Data. Anticipating the impact of personal data usage on individuals and society
> Laura Varisco, Sara Colombo, Federico Casalegno, Italy

Social consensus: Contribution to design methods for ai agents that employ personal data
> Milica Pavlovic, Francesco Botto, Margherita Pillan, Carmen Criminisi, Massimo Valla, Italy

Evaluation of the effects of an AC magnetic field on cutaneous blood flow volume by cold water immersion test
> Nur Izyana Faradila Binti Azmi, Hideyuki Okano, Hiromi Ishiwatari, Keiichi Watanuki, Japan

Proposal of a method to evoke cross-cultural communication by using digital signage
> Kimi Ueda, Motoki Urayama, Hiroshi Shimoda, Hirotake Ishii, Rika Mochizuki, Masahiro Watanabe, Japan

Enhancing cursor control using eye movements
> Muhammad Sohaib Shakir, Amna Akhtar, Habiba Khaqan, Anam Mukhtar, Iqra Saleem, Pakistan

Investigation of Influences on the Collaborative Behavior Between Humans and Machines by Exploiting the Concept of eXplainable AI
> Tim Lauer, Felix Reinfurt, Germany

15	**IHSI 1: Humans and Artificial Cognitive Systems III** Co-Chairs: Florian Artinger, Germany and Si Liu, Spain

16:30 -18:30 - SAPPHIRE 411 A

Design components of clinical work environments with computerized decision support systems
> Florian Artinger, Uta Wilkens, Germany

Deployment of a mobile wireless eeg system to record brain activity associated with physical navigation in the blind: A proof of concept.
> Christopher Bennett, Laura Dubreuil Vall, Jorge Leite, Giulio Ruffini, Lotfi Merabet, United States

An affective decision making model with applications to social robotics
> Si Liu, David Rios Insua, Spain

Design methodology for flight deck layout of civil transport aircraft
> Zhefeng Jin, Yinbo Zhang, Haiyan Liu, Dayong Dong, China

Human resource development opportunities in Latvian health care organization
> Henrijs Kalkis, Ansis Ventins, Sandis Babris, Zenija Roja, Kristine Bokse, Latvia

Motion Capture automated customized presets
> Wiliam Andrade, Jonathan Nishida, Milton Vieira, Gabriel Prim, Gustavo Boehs, Brazil

An estimation method of intellectual concentration state by machine learning of physiological indices
> Kaku Kimura, Shutaro Kunimasa, You Kusakabe, Hirotake Ishii, Hiroshi Shimoda, Japan

Detailed Technical Program

16 | **IHSI 2: Intelligence, Technology and Analytics III**
Co-Chairs: Farhi Marir, United Arab Emirates and Bernard Jiang, Taiwan

16:30 -18:30 - SAPPHIRE 411 B

A recursive co-occurrence text mining of the quran to build corpora for islamic banking business processes
> Farhi Marir, Issam Tlemsani, Munir Majdalawieh, United Arab Emirates

Applying random forest method to analyze elderly fitness training routine data
> Bernard Jiang, Chia Hsuan Lee, Tien-Lung Sun, Flores Diana Eloisa Roa, Taiwan

Adaptive learning for robots in public spaces
> Xiaohua Sun, Jan Dornig, Shengchen Zhang, China

Digital television in EU in terms of increasing demographic fragmentation of the audience (a cross-national research)
> Nadezhda Miteva, Bulgaria

Environment-factor-intellectual concentration (EFiC) framework: Method for deriving mechanism for improving workplace environment
> Kyoko Ito, Daisuke Kamihigashi, Hirotake Ishii, Hiroshi Shimoda, Japan

17 | **IHSI 3: Computational Modeling and Simulation III**
Co-Chairs: Vivek Varma, USA and Marja Liinasuo, Finland

8:30 - 10:30 - SAPPHIRE 410 A

The effects of situational context on information valuation
> Justine Caylor, Robert Hammell, Timothy Hanratty, Eric Heilman, John Richardson, United States

Cloud as innovation enabler: Applying systems-based approach
> Vivek Varma, Ashwani Singh, John Cranfill, United States

Human factors in software projects for complex industrial processes
> Marja Liinasuo, Toni Lastusilta, Jouni Savolainen, Timo Kuula, Finland

Dreaming mechanism for training bio-inspired driving agents
> Alice Plebe, Gastone Pietro Rosati Papini, Riccardo Donà, Mauro Da Lio, Italy

An agent-based model of plastic bags ban policy diffusion in California
> Zining Yang, Sekwen Kim, United States

The construction of agent simulations of human behavior
> Roger Parker, United States

19 | **IHSI 5: Smart Materials and Inclusive Human Systems III**
Co-Chairs: Hebert Silva, Brazil and Muhammad Faisal Waheed, Pakistan

8:30 - 10:30 - SAPPHIRE 411 A

Analysis of the mental workloads applied to press operators during the reuse and recycling of materials
> Hebert Roberto Da Silva, Brazil

Impact of emerging technologies for sustainable fashion, textile and design
> Muhammad Faisal Waheed, Ahmad Khalid, Pakistan

Critical success factors for construction industry in Africa and Asia
> Osei Yaw Safo-Kantanka, Clinton Aigbavboa, Wellington Didibhuku Thwala, South Africa

Causes of construction orders variation: A case study of Polokwane, Limpopo Province
> Pfumelani Maluleke, Wellington Didibhuku Thwala, Clinton Aigbavboa, South Africa

Detailed Technical Program

20	**IHSI 6: Human-Autonomy Teaming III** Co-Chairs: Nia Peters, USA and Sean Barton, USA

8:30 - 10:30 - SAPPHIRE 411 B

Task boundary inference via topic modeling to predict interruption timings for human-machine teaming
> Nia Peters, George Bradley, Tina Marshall-Bradley, United States

Using ai-planning to solve a kinodynamic path planning problem and its application for HAPS
> Jane Jean Kiam, Axel Schulte, Enrico Scala, Germany

Evaluating the coordination of agents in multi-agent reinforcement learning
> Sean Barton, Erin Zaroukian, Derrik Asher, Nicholas Waytowich, United States

Development of an individual joint controllable haptic glove (CRL-Glove) and apply for CLASS
> Kazushige Ashimori, Hiroshi Igarashi, Japan

Analysis of force interaction for teamwork assistance by concern for others
> Genki Sasaki, Hiroshi Igarashi, Japan

Defining generic tasks to guide UAVs in a MUM-T aerial combat environment
> Sebastian Lindner, Simon Schwerd, Axel Schulte, German

The influence of robot anthropomorphic appearance on compliance to perform a task
> Kerstin Haring, Ariana Mosley, Sarah Pruznick, Julie Fleming, Kelly Satterfield, Gregory Funke, Victor Finomore, Chad Tossell, Ewart De Visser, United States

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10:30 - 11:00 • Coffee Break - Refreshments will be provided

21	**IHSI 7: Applications and Future Trends III** Co-Chairs: Deepank Verma, India and Yu Jin, China

11:00 - 13:00 - SAPPHIRE 410 A

Ergonomics index system for airplane cockpit display and control resources
> Qingyuan Bai, Bai Yang, Wang Xinglong, Zhao Xingmei, Yu Jin, China

Artificial intelligence and human senses for the evaluation of urban surroundings
> Deepank Verma, Arnab Jana, Krithi Ramamritham, India

Mobile AR tourist attraction guide system design based on image recognition and user behavior
> Xiaozhou Zhou, Zhe Sun, Chengqi Xue, Yun Lin, Jing Zhang, China

Evaluation of helmet comfort based on flexible pressure sensor matrix
> Xiao Chen, Cong Zhang, Chuang Ma, Haixiao Liu, Yanling Zheng, Yi Jiang, Yuanyuan Zu, Jianwei Niu, China

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22	**IHSI 1: Humans and Artificial Cognitive Systems IV** Co-Chairs: Ashwani Singh, USA and Jaroslaw Kowalski, Poland

11:00 - 13:00 - SAPPHIRE 410 B

Business impact of AI/chatbots on operational efficiency and customer satisfaction
> Vivek Varma, Ashwani Singh, John Cranfill, United States

Smart home technology as a creator of a super-empowered user
> Jaroslaw Kowalski, Cezary Biele, Kazimierz Krzysztofek, Poland

Impact of inspiration sources on designer's idea generation strategy
> Xinyu Yang, Jianxin Cheng, China

How might voice assistants raise our children?
> Cezary Biele, Anna Jaskulska, Wieslaw Kopec, Jaroslaw Kowalski, Kinga Skorupska, Aldona Zdrodowska, Poland

WeChat Wisdom medical treatment process based on the Hall three-dimensional structure
> Xueman Pan, Chikun Chen, Fenghong Wang, China

Sunday, February 10

Detailed Technical Program

23	**IHSI 2: Intelligence, Technology and Analytics IV** Co-Chairs: Ediber Diaz, Peru and Dan Wang, China

11:00 - 13:00 - SAPPHIRE 411 A	**Understanding ordinary and disruptive events discussion in twitter: Barbados environmental health hazard as a use case**
	    Adel Alshehri, Aseel Addawood, United States
	A systematic literature review about quantitative metrics to evaluate the usability of e-commerce websites
	    Ediber Diaz, Juan Arenas, Arturo Moquillaza, Freddy Paz, Peru
	The influence of target layout on dragging performance based on eye-control technique
	    Tuoyang Zhou, Yingwei Zhou, Dan Wang, Yuting Zhao, Haixiao Liu, Chi Zhang, Jinshou Shi, Chuang Ma, Xin Wang, Xiai Wang, Jianwei Niu, China
	Integrating hydrodynamic models and satellite images to implement erosion control measures and track changes along streambanks
	    Mohamed Elhakeem, Thanos Papanicolaou, Evan Paleologos, United Arab Emirates

	13:00 - 14:00 • Lunch Break •

26	**IHSI 7: Applications and Future Trends IV** Co-Chairs: Philipp Jordan, USA and Lungwen Kuo, Taiwan

14:00 -16:00 - SAPPHIRE 410 B	**Building an argument for the use of science fiction in HCI education**
	    Philipp Jordan, Paula Alexandra Silva, United States
	Visual color in web design and visual product aesthetics
	    Lungwen Kuo, Chih-Chun Lai, Taiwan
	A deep learning model for theoretical terms extraction and its self-training algorithm
	    Fang Wang, China
	Assessment of the delays in the delivery of public sector projects in South Africa
	    Xitshembiso Shivambu, Wellington Didibhuku Thwala, South Africa

27	**IHSI 1: Humans and Artificial Cognitive Systems V** Co-Chairs: Oliver Petrovic, Germany and Kevin Clark, USA

14:00 -16:00 - SAPPHIRE 411 A	**The effects of culture on authentication cognitive dimensions**
	    Mona Mohamed, United States
	Culture-centered design and digital transformation
	    Kevin Clark, Kazuhiko Yamazaki, United States
	Interaction patterns for arbitration of movement in cooperative human-machine systems: One-dimensional arbitration and beyond
	    Daniel López Hernández, Marcel Baltzer, Konrad Bielecki, Frank Flemisch, Germany
	Research on design strategy of sorting garbage bins based on the CREATE action funnel
	    Shaoping Guan, Lu Shen, Rui Cao, China
	An approach on simplifying the commissioning of collaborative workstations based on product-lifecycle-management and intuitive robot programming
	    Werner Herfs, Simon Storms, Oliver Petrovic, Germany

Detailed Technical Program

28	**IHSI 2: Intelligence, Technology and Analytics V** Co-Chairs: Sven Hinrichsen, Germany and Felix Top, Germany

14:00 -16:00 - SAPPHIRE 411 B

How to design assembly assistance systems
> Sven Hinrichsen, Manfred Bornewasser, Germany

How to increase crane control usability: An intuitive hmi for remotely operated cranes in industry and construction
> Felix Top, Michael Wagner, Johannes Fottner, Germany

Warehouse storage assignment by genetic algorithm with multiple objectives
> Chi-Bin Cheng, Yu-Chi Weng, Taiwan

A platform for assessing physical education activity engagement
> Rafael Andre, Alberto Raposo, Hugo Fuks, Brazil

Application of the usability metrics of the ISO 9126 standard in the E-Commerce domain: A case study
> Freddy Paz, Ediber Diaz, Arturo Moquillaza, Peru

Design of smart city evaluation based on the theory of White Bi
> Xinying Wu, Ming-Gang Yang, Xin-Xin Zhang, China

16:00 - 16:30 • Coffee Break - Refreshments will be provided

30	**IHSI 7: Applications and Future Trends V** Co-Chairs: Fang Wang, China and Wellington Didibhuku Thwala, South Africa

16:30 -18:30 - SAPPHIRE 410 B

Engineered resilient systems, visualization technologies supporting complex data analytics
> Joshua Church, Timothy Garton, United States

Gamification for safety
> Alexander Zakharov, Vitaliy Tretyakov, Russia

Finger-joint tracking based real-time alphabet and digit recognition using a 3D depth camera
> Md. Shahinur Alam, South Korea

A deep learning model for theoretical terms extraction and its self-training algorithm
> Fang Wang, China

The future solutions to hyper-computations to support cyber security applications
> Mkrttchian Vardan, Australia

Assessment of Lesotho contractor development programme
> Shadrack M Manama, Wellington Didibhuku Thwala, South Africa

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31	**IHSI 1: Humans and Artificial Cognitive Systems VI** Co-Chairs: Simon Roggendorf, Germany and Dalit Levy, Israel

16:30 -18:30 - SAPPHIRE 411 A

Simulation-based planning and programming system for the assembly of products with a wide range of variants in collaboration between worker and robot
> Werner Herfs, Simon Storms, Simon Roggendorf, Germany

Discover, imagine, change: Community place-based activities using unique mobile applications
> Dalit Levy, Israel

How to choose one sustainable design method over another: A consumer-product optimizing prototype
> Shaoping Guan, Rui Cao, Lu Shen, China

How perceived real-world danger affect virtual reality experiences
> Shengjie Yao, Gyoung Kim, China and South Korea

Interactive Poster Demonstrations

Posters will be displayed Saturday, February 9, 2019 and Sunday, February 10, 2019. Posters must be removed by the end of each day/session they are scheduled to be demonstrated. Posters can be positioned starting on Saturday, February 9, 8:00 a.m. and removed by the last poster session on February 10, after 16:30. Poster demonstration sessions will be at the times shown below.

POSTER/DEMONSTRATION SESSIONS SATURDAY, FEBRUARY 9
Session Time: 10:30 - 12:30
Room: Sapphire Foyer

A1. Assessing social driving behavior
Pietro Perconti, Alessio Plebe, Giorgio Grasso, Italy

A2. Interaction model analysis for single-person household in South Korea using persona-based scenario method
Mi Chang, Ken Nah, South Korea

A3. How consumers talk with shopping windows
Freimut Bodendorf, Germany

A4. Code of Breakthrough Innovations
Anda Batraga, Jelena Salkovska, Liga Braslina, Henrijs Kalkis, Daine Skiltere, Aija Legzdina, Girts Braslins, Latvia

A5. Significance of technology factors in the context of development of health care sector in Latvia
Daiga Behmane, Henrijs Kalkis, Anita Villerusa, Uldis Berkis, Didzis Rutitis, Latvia

A6. Technologies for effective after action reviews: improving performance for manned-unmanned teams
Ralph Brewer, Anthony Zimmermann, Eugene Pursel, Eduardo Cerame, Kristin Schaefer-Lay, United States

A7. Web search skill evaluation from eye and mouse momentum
Takeshi Matsuda, Ryutaro Ushigome, Michio Sonoda, Hironobu Satoh, Tomohiro Hanada, Nobuhiro Kanahama, Masashi Eto, Hiroki Ishikawa, Katsumi Ikeda, Daiki Katoh, Japan

POSTER/DEMONSTRATION SESSIONS SATURDAY, FEBRUARY 9
Session Time: 14:00 - 16:30
Room: Sapphire Foyer

B1. The process of visitor studies in art museum tracking the behavior of museum visitors
Taeha Yi, Ji-Hyun Lee, South Korea

B2. Container based e-learning environment control method for ensuring sustainable operation against multiple crises
Satoshi Togawa, Kazuhide Kanenishi, Japan

B3. A new method for delivering a non-contact tactile sensation in virtual environment.
Ji-Hun Jo, Soon-Cheol Chung, Mi-Hyun Choi, Hyung-Sik Kim, South Korea

B4. Visual system examination using synthetic scenarios
Robert Manthey, Rico Thomanek, Christian Roschke, Tony Rolletschke, Benny Platte, Marc Ritter, Danny Kowerko, Germany

B5. The impact of analogic, digital and hybrid representations in the ideation phase of an artifact design: An educational perspective
Vasco Santos, Ana Ferreira, Eduardo Gonçalves, Portugal

Interactive Poster Demonstrations

POSTER/DEMONSTRATION SESSIONS SATURDAY, FEBRUARY 9
Session Time: 14:00 - 16:30
Room: Sapphire Foyer

B6.   Cardiovascular parameters for mental workload detection of air traffic controllers
      Thea Radüntz, Thorsten Mühlhausen, Norbert Fürstenau, Emilia Cheladze,
      Beate Meffert, Germany
B7.   Weighing the importance of drivers' workload measurement standardization
      Eduarda Pereira, Susana Costa, Nélson Costa, Pedro Arezes, Portugal

POSTER/DEMONSTRATION SESSIONS SUNDAY, FEBRUARY 10
Session Time: 10:30 - 12:30
Room: Sapphire Foyer

C1.   Movement characteristics of fingers during hand grabbing process
      Zhelin Li, Zunfu Wang, Yongyi Zhu, Lijun Jiang, China
C2.   A study of user experience in knowledge-based QA chat bot design
      Rongjia Liu, Zhanxun Dong, China
C3.   HERITOUCH: A 3D-printed audio-tactile cultural heritage for the visually impaired
      Meereh Kim, Po Yan Lai, Kwandong Kim, Dongseok Yang, Jaehong Ahn,
      South Korea
C4.   Estimation of mental workloads considering information of peripheral vessels by
      non-contact measurement using microwave radar
      Satoshi Suzuki, Yuta Terazawa, Kentaro Kotani, Takafumi Asao, Japan
C5.   A toolkit to help integrate humans with virtual environments, intelligent
      simulations (FSMs), and artificial cognitive systems (NPCs)
      Caroline Kingsley, Michael Jenkins, United States
C6.   Effect of Fiber Arrangement on Sound and Vibration in CFRP Composite Plate
      for Interior Sound Quality Control
      Sang Kwon Lee, South Korea
C7.   A Flexible Interaction Module for Adaptive User Control for Autonomous
      Transport Vehicles
      Jana Jost and Thomas Kirks, Germany

POSTER/DEMONSTRATION SESSIONS SUNDAY, FEBRUARY 10
Session Time: 14:00 - 16:30
Room: Sapphire Foyer

D1.   "I'm your personal Co-Driver – how can I assist you?" – Assessing the potential of
      personal assistants for truck drivers
      Jana Fank, Markus Lienkamp, Germany
D2.   Show me how you click, and i'll tell you what you can: Predicting user
      competence and performance by mouse interaction parameters
      Christiane Attig, Ester Then, Josef F. Krems, Germany
D3.   Beyond function allocation: a proposed strategy for optimal crewing of future
      vertical lift
      Emilie Roth, Christen Sushereba, Katherine Ernst, Laura Militello, United States
D4.   The role of empathy in healthcare services
      Hyungsin Kim, Hakkyun Kim, South Korea
D5.   Virtual ten diagrams on Sage learning
      Hyungsin Kim, Wonjean Lee, Hyunjean Lee, South Korea

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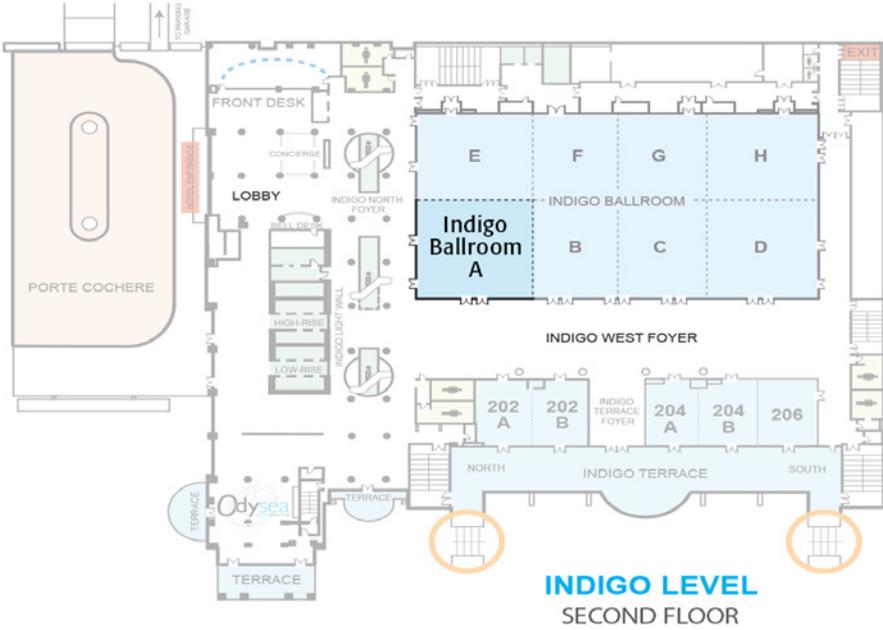### IHSI 7: Applications and Future Trends

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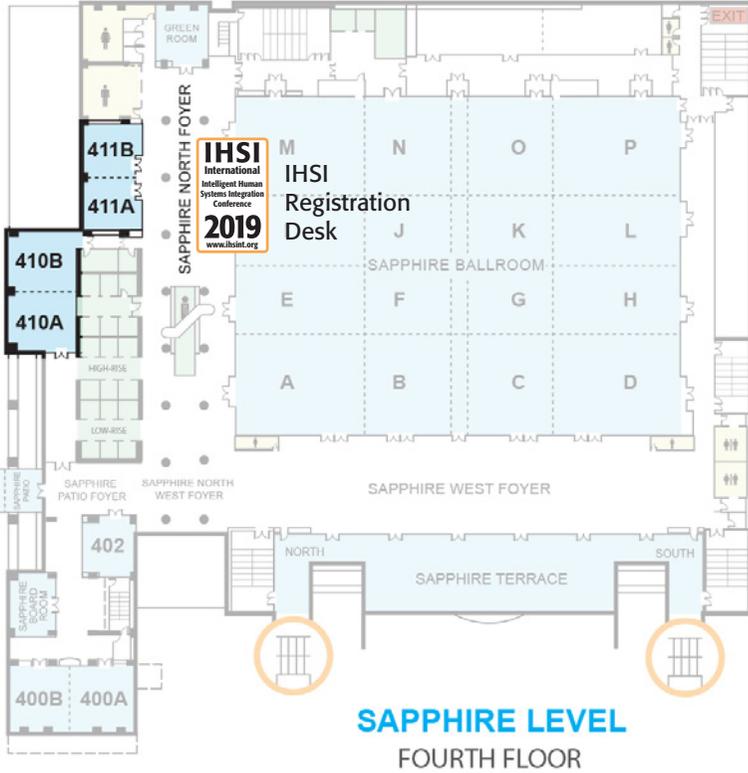
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Conference Keynote: 13:00-15:00 Friday February 8, 2019
Hilton San Diego Bayfront in Indigo Ballroom A (Second Floor)

INDIGO LEVEL
SECOND FLOOR

Conference Reception Banquet: 18:00-22:00 Friday, February 8, 2019
Hilton San Diego Bayfront at Promenade Plaza (Lobby level)

PROMENADE LEVEL
FIRST FLOOR

Conference Registration and Sessions (Saturday February 9 - Sunday February 10, 2019)
Hilton San Diego Bayfront at Sapphire Level (Fourth Floor)

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16-18 September, 2019