

2021 14th International Conference on Human System Interaction (HSI 2021)

**Gdansk, Poland
8 – 10 July 2021**



**IEEE Catalog Number: CFP2121D-POD
ISBN: 978-1-6654-3108-8**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP2121D-POD
ISBN (Print-On-Demand):	978-1-6654-3108-8
ISBN (Online):	978-1-6654-4112-4
ISSN:	2158-2246

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Contents

1	Keynote Lectures	13
2	Cyber Security in HSI	15
	Cyber Security in HSI	15
	<i>Viktoras Bulavas</i> Improving machine learning model performance on detection of network infiltration	16
	<i>Pierre-Emmanuel Arduin, Kathia Marcal de Oliveira, Christophe Kolski</i> Trust me and Click! A Pilot Study of Cognitive Walkthrough for Phishing Emails	22
3	Education and Training	29
	Education and Training	29
	<i>Markus Kohl, Tabea Richter, Jens Lopitzsch, Johannes Fottner</i> Systematic Determination of Competency Requirements for Employees in Logistics	30
	<i>Wei Ming Pang, Tze Wei Liew, Meng Chew Leow</i> Emotional design for educational multimedia: A mini-review	38
	<i>Steven Hawthorn, Rui Jesus, Maria Ana Baptista</i> Identification of Knowledge Gaps to Inform a Serious Game for Tsunami Risk Communication	46
4	Health Care and Assistive Devices	53
	Health Care and Assistive Devices	53
	<i>Yudai Kitano, Koji Makino, Naofumi Taniguchi, Tetsuro Ohba, Takaaki Ishii, Masaki Miyashita, Kent Ota, Yasumi Ito, Hirakata Haro, Hidetsugu Terada</i> Verification of tightening torque of rod fixing parts of ultrasonic growing rod system for spinal fusion	54
	<i>Pawel Cieszko, Marcin Kulawiak, Natalia Kulawiak, Katarzyna Sikorska, Aleksander Stojanowski, Piotr Golawski</i> Development of a tropical disease diagnosis system using artificial neural network and GIS	59
	<i>Maciej Szankin, Alicja Kwasniewska, Natalia Glowacka, Jacek Rumin-ski, Rey Nicolas, David Gamba</i> Fully Automated AI-powered Contactless Cough Detection based on Pixel Value Dynamics Occurring within Facial Regions	63

<i>Lenka Lhotska, Patrik Kutilek, Jan Husak, Anna Francova, Jan Hejda, Jakub Stejskal, Martin Kotek, Jan Hybl, Pavla Stopkova, Iveta Fajnerova</i> Virtual Reality for Exposure Therapy	70
5 Human Computer and Machine Interaction	77
Human Computer and Machine Interaction	77
<i>Marek Blok, Jan Banas, Mariusz Pietrolaj</i> IFE: NN-aided Instantaneous Pitch Estimation	78
<i>Tze Wei Liew, Su-Mae Tan, Jessica Tee, Gerald Guan Gan Goh</i> The effects of designing conversational commerce chatbots with expertise cues	85
<i>Wenxin Sun, Mengjie Huang, Rui Yang, Ji Han, Yong Yue</i> Mental Workload Evaluation of Virtual Object Manipulation on WebVR: An EEG Study	91
<i>Sashank Sridhar, Sowmya Sanagavarapu</i> Multi-Head Self-Attention Transformer for Dogecoin Price Prediction	97
<i>Amira Dhouib, Christophe Kolski, Abdelwaheb Trabelsi, Mahmoud Neji</i> ISO/IEC 25040 Adaptation for Interactive Adaptive Systems Evaluation	103
6 Robotics and HSI in Robotics	109
Robotics and HSI in Robotics	109
<i>Maarika Oidekivi, Alexander Nolte, Alvo Aabloo, Karl Kruusamae</i> Identifying emotions from facial expression displays of robots - results from a survey study	110
7 Vehicular Systems and Assisted Driving	115
Vehicular Systems and Assisted Driving	115
<i>Maarika Oidekivi, Alexander Nolte, Alvo Aabloo, Karl Kruusamae</i> Interpreting externally expressed intentions of an autonomous vehicle	116
<i>Tomas Potuzak</i> Improved Road Traffic Network Division based on Genetic Algorithm and Graph Coarsening	122
8 Wearable Devices and Systems	131
Wearable Devices and Systems	131
<i>Haruo Igarashi, Hideyuki Sawada</i> Touching 4D Objects with 3D Tactile Feedback	132
<i>Andreas P. Weiss, Christian Fragner, Franz P. Wenzl</i> A novel Approach for HumanSystem Interaction by Visible Light Sensing based Wrist Posture and Rotation Determination	139
9 Human system interaction in biomedical engineering	145

Human system interaction in biomedical engineering	145
<i>Weronika Celniak, Piotr Augustyniak</i> Detection of Human Blood Pulse Based on Displacement Vector in Video Footage	146
<i>Tomasz Kocejko</i> Using deep learning to increase accuracy of gaze controlled prosthetic arm	150
<i>Tomasz Dziubich, Marcin Perdeusz, Artur Skrzynecki</i> Assessment of particular abdominal aorta section extraction from contrast-enhanced computed tomography angiography	155
10 Human System Interaction Solutions for Ambient Assisted Living	161
Human System Interaction Solutions for Ambient Assisted Living	161
<i>Artur Polinski, Adam Bujnowski, Tomasz Kocejko, Jerzy Wtorek</i> Influence of preprocessing techniques on pulse pressure velocity determination	162
<i>Magdalena Mazur-Milecka, Natalia Glowacka, Mariusz Kaczmarek, Adam Bujnowski, Młotysz Kaszynski, Jacek Ruminski</i> Smart city and fire detection using thermal imaging	167
11 Recent Advances on Artificial Intelligence and Deep Learning for Human System Interaction	175
Recent Advances on Artificial Intelligence and Deep Learning for Human System Interaction	175
<i>Zechao Liu, Yandong Li, Lifang Wu, Kejian Cui, Jianhua Yan, Hui Yu</i> Model guided DLP 3D printing for solid and hollow structure . . .	176
<i>Michal Bogacz, Marcin Iwanowski</i> Towards many-to-one neural style transfer method	182
<i>Mateusz Bartosiewicz, Izabela Krupinska, Maciej Bany, Anna Konieczna, Mateusz Ostrowski, Maciej Zalewski, Maciej Iwanowski</i> Generating image captions in Polish - experimental study	188
<i>Van-Thanh Hoang, Kang-Hyun Jo</i> Practical Analysis on Architecture of EfficientNet	194
<i>Zen Kato, Sanggyu Shin</i> Economic impact analysis of news articles based on polarity analysis of news	198
<i>Elhassan Mohamed, Konstantinos Sirlantzis, Gareth Howells</i> Incorporation Of Rejection Criterion - A Novel Technique For Evaluating Semantic Segmentation Systems	202
<i>Shuto Shimizu, Sanggyu Shin</i> Applicability of SARIMA Model in Tokyo Population Migration Forecast	209
<i>Efklidis Katsaros, Anna Jezierska, Daniel Wesierski</i> Leveraging spatio-temporal features for joint deblurring and segmentation of instruments in dental video microscopy	213
<i>Chathurika S. Wickramasinghe, Daniel L. Marino, Milos Manic</i> Deep Embedded Clustering with ResNets	218
<i>Michal Kielczykowski, Grzegorz Sarwas</i> Human 3D pose estimation based on inception architecture	224

12 Theory and Technologies on Human Factors in Advanced HumanMachine Environment	231
Theory and Technologies on Human Factors in Advanced HumanMachine Environment	231
<i>Alexander Mertens, Sebastian Puetz, Philipp Brauner, Anne Kathrin Schaar, Thomas Gries, Carmen Leicht-Scholten, Saskia Nagel, Gunther Schuh, Martina Ziefle, Verena Nitsch</i> Human Digital Shadow: Data-based Modeling of Users and Usage in the Internet of Production	232
<i>Tomoya Oguri, Sho Yokota, Akihiro Matsumoto, Daisuke Chugo, Satoshi Muramatsu, Hiroshi Hashimoto</i> Development of Robotic IV Pole moving side by side with Human - First report: Design of the first prototype and forward moving experiment -	240
<i>Daisuke Chugo, Shunsuke Yamada, Satoshi Muramatsu, Sho Yokota, Jin Hua She, Hiroshi Hashimoto</i> Mobile Robot Navigation Considering How to Move with a Group of Pedestrians in a Crosswalk	246
<i>Xiangfeng Tan, Jinhua She, Shumei Chen, Sumio Ohno, Hiroyuki Kameda</i> Analysis of Student Learning Behavior based on Moodle Log Data	253
13 Author index	257
Author index	257