## Contents

### User Experience in Virtual and Augmented Environments

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design of the Augmented Reality Based Training System to Promote Spatial Visualization Ability for Older Adults.</td>
<td>3</td>
</tr>
<tr>
<td><em>Kuo-Ping Chang and Chien-Hsu Chen</em></td>
<td></td>
</tr>
<tr>
<td>The Effectiveness of Virtual Reality for Studying Human Behavior in Fire ...</td>
<td>13</td>
</tr>
<tr>
<td><em>Xinxin Feng, Rongzhen Cui, and Jiabao Zhao</em></td>
<td></td>
</tr>
<tr>
<td>Pilot Study for Telepresence with 3D-Model in Mixed Reality</td>
<td>22</td>
</tr>
<tr>
<td><em>Sungchul Jung and Charles E. Hughes</em></td>
<td></td>
</tr>
<tr>
<td>Synthetic Evaluation Method of Electronic Visual Display Terminal Visual Performance Based on the Letter Search Task.</td>
<td>30</td>
</tr>
<tr>
<td><em>Wei Liu, Weixu Cai, Borui Cui, and Muxuan Wang</em></td>
<td></td>
</tr>
<tr>
<td>Subjective Usability Evaluation Criteria of Augmented Reality Applications ...</td>
<td>39</td>
</tr>
<tr>
<td><em>Valéria Farinazzo Martins, Tereza Gonçalves Kirner, and Claudio Kirner</em></td>
<td></td>
</tr>
<tr>
<td>Spatial Mapping of Physical and Virtual Spaces as an Extension of Natural Mapping: Relevance for Interaction Design and User Experience</td>
<td>49</td>
</tr>
<tr>
<td><em>Daniel Pietschmann and Peter Ohler</em></td>
<td></td>
</tr>
<tr>
<td>The Impact of Time Pressure on Spatial Ability in Virtual Reality ...</td>
<td>60</td>
</tr>
<tr>
<td><em>Hua Qin, Bole Liu, and Dingding Wang</em></td>
<td></td>
</tr>
<tr>
<td>Research on the Visual Comfort for Small Spaces in Different Illuminance Environments</td>
<td>67</td>
</tr>
<tr>
<td><em>Linghua Ran, Xin Zhang, Hua Qin, and Taijie Liu</em></td>
<td></td>
</tr>
<tr>
<td>Analysis of Sociocultural Constructs Applicable to Blue Force Teams: Increasing Fidelity from Pencil and Paper and Video Tests to Virtual Environments</td>
<td>74</td>
</tr>
<tr>
<td><em>David Scribner, Pete Grazaitis, Asi Animashaun, Jock Grynovicki, and Lauren Reinerman-Jones</em></td>
<td></td>
</tr>
<tr>
<td>Influence of Highlighting Words Beneath Icon on Performance of Visual Search in Tablet Computer</td>
<td>81</td>
</tr>
<tr>
<td><em>Li Wang, Liezhong Ge, Ting Jiang, Hongyan Liu, Hongting Li, Xinkui Hu, and Hanling Zheng</em></td>
<td></td>
</tr>
</tbody>
</table>
Applying Tangible Augmented Reality in Usability Evaluation

Xiaotian Zhang and Young Mi Choi

Developing Virtual and Augmented Environments

Fact and Fiction Merge in Telepresence and Teleoperation: A Present and Future Perspective

Gordon M. Mair

Delta Global Illumination for Mixed Reality

Maik Thöner and Arjan Kuijper

Registration System Errors Perception in Augmented Reality Based on RGB-D Cameras

Daniel M. Tokunaga, Cléber G. Corrêa, Fernanda M. Bernardo, João Bernardes, Edith Ranzini, Fátima L.S. Nunes, and Romero Tori

Local 3D Pose Estimation of Feature Points Based on RGB-D Information for Object Based Augmented Reality

Daniel M. Tokunaga, Ricado Nakamura, João Bernardes, Edith Ranzini, and Romero Tori

Towards a Structured Selection of Game Engines for Virtual Environments

Martin Westhoven and Thomas Alexander

Evaluation and Fair Comparison of Human Tracking Methods with PTZ Cameras

Alparslan Yildiz, Noriko Takemura, Yoshio Iwai, and Kosuke Sato

Agents and Robots in Virtual Environments

Experimental Environments for Dismounted Human-Robot Multimodal Communications

Julian Abich IV, Daniel J. Barber, and Lauren Reinerman-Jones

Displays for Effective Human-Agent Teaming: The Role of Information Availability and Attention Management

Maia B. Cook, Cory A. Rieth, and Mary K. Ngo

Exploring the Implications of Virtual Human Research for Human-Robot Teams

Jonathan Gratch, Susan Hill, Louis-Philippe Morency, David Pynadath, and David V. Traum

Animation Guidelines for Believable Embodied Conversational Agent Gestures

Ivan Gris, Diego A. Rivera, and David Novick
A Mark-Up Language and Interpreter for Interactive Scenes for Embodied Conversational Agents .......................................................... 206

David Novick, Mario Gutierrez, Ivan Gris, and Diego A. Rivera

Displays for Effective Human-Agent Teaming: Evaluating Attention Management with Computational Models .................................. 216

Cory A. Rieth, Maia B. Cook, and Mary K. Ngo

Intelligent Agents for Virtual Simulation of Human-Robot Interaction ........ 228

Ning Wang, David V. Pynadath, K.V. Unnikrishnan, Santosh Shankar, and Chirag Merchant

VR for Learning and Training

GlassClass: Exploring the Design, Implementation, and Acceptance of Google Glass in the Classroom .................................................. 243

Dave A. Berque and James T. Newman

Augmented Reality Training of Military Tasks: Reactions from Subject Matter Experts ................................................................. 251

Roberto Champney, Stephanie J. Lackey, Kay Stanney, and Stephanie Quinn

Training Effectiveness Evaluation: Call for Fire Trainer – Augmented Virtuality (CFFT-AV) ............................................................... 263

Gino Fragomeni, Stephanie J. Lackey, Roberto Champney, Julie Nanette Salcedo, and Stephen Serge

Design and Analysis of the Learning Process Management System ........... 273

Songfeng Gao and Ziqi Wang

Applying Research in the Cognitive Sciences to the Design and Delivery of Instruction in Virtual Reality Learning Environments .......... 280

Martin S. Goodwin, Travis Wiltshire, and Stephen M. Fiore

Virtual Approach to Psychomotor Skills Training: Manipulating the Appearance of Avatars to Influence Learning ......................... 292

Irwin Hudson and Karla A. Badillo-Urquiola

Squad Overmatch: Using Virtual Technology to Enhance Live Training Environments ................................................................. 300

Patrick M. Ogden, Terry N. Wollert, Paul Butler, and Julie N. Salcedo

Leveraging Stress and Intrinsic Motivation to Assess Scaffolding During Simulation-Based Training ...................................................... 309

Julie Nanette Salcedo, Stephanie J. Lackey, and Karla A. Badillo-Urquiola
Working the Modes: Understanding the Value of Multiple Modalities of Technologies for Learning and Training Success ........................................ 321  
Eileen Smith, Ron Tarr, Cali Fidopiastis, and Michael Carney

Augmenting Reality in Sensor Based Training Games ........................... 329  
Peter A. Smith

A Serious-Game Framework to Improve Physician/Nurse Communication  337  
Marjorie Zielke, Susan Houston, Mary Elizabeth Mancini, Gary Hardee,  
Louann Cole, Djakhingir Zakhidov, Ute Fischer, and Timothy Lewis

VR in Health and Culture

Low Cost Hand-Tracking Devices to Design Customized Medical Devices.  351  
Giorgio Colombo, Giancarlo Facoetti, Caterina Rizzi, and Andrea Vitali

Effect of 3D Projection Mapping Art: Digital Surrealism ........................ 361  
Soyoung Jung, Frank Biocca, and Daeun Lee

Human Factors and Interaction Strategies in Three-Dimensional Virtual  
Environments to Support the Development of Digital Interactive  
Therapeutic Toy: A Systematic Review ............................................... 368  
Eunice P. dos Santos Nunes, Eduardo M. Lemos, Cristiano Maciel,  
and Clodoaldo Nunes

Development and Evaluation of an Easy-to-Use Stereoscopic Ability  
Test to Assess the Individual Ability to Process Stereoscopic Media ........ 379  
Daniel Pietschmann, Benny Liebold, Peter Ohler, and Georg Valtin

The Virtual Meditative Walk: An Immersive Virtual Environment for Pain  
Self-modulation Through Mindfulness-Based Stress Reduction Meditation ... 388  
Xin Tong, Diane Gromala, Amber Choo, Ashfaq Amin, and Chris Shaw

Digital Archiving of Takigi Noh Based on Reflectance Analysis ............... 398  
Wataru Wakita, Shiro Tanaka, Kohei Furukawa, Kozaburo Hachimura,  
and Hiromi T. Tanaka

Multimodal Digital Taste Experience with D’Licious Vessel ..................... 409  
Liangkun Yan, Barry Chew, Jie Sun, Li-An Chiu, Nimesha Ranasinghe,  
and Ellen Yi-Luen Do

Industrial and Military Applications

Assessing Performance Using Kinesic Behavior Cues in a Game-Based  
Training Environment ......................................................................... 421  
Karla A. Badillo-Urquiola and Crystal S. Maraj