## Contents

### Developing Virtual and Augmented Environments

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical Mapping of Linear Walk from Infinite Virtual Space</td>
<td>3</td>
</tr>
<tr>
<td>to Finite Real Space</td>
<td></td>
</tr>
<tr>
<td><em>Angelos Barmpoutis</em></td>
<td></td>
</tr>
<tr>
<td>Leaning-Based 360° Interfaces: Investigating Virtual Reality Navigation Interfaces with Leaning-Based-Translation and Full-Rotation</td>
<td>15</td>
</tr>
<tr>
<td><em>Abraham M. Hashemian and Bernhard E. Riecke</em></td>
<td></td>
</tr>
<tr>
<td>Curved Plates Positioning and Flexible Brackets Control in Virtual Shipbuilding Simulation</td>
<td>33</td>
</tr>
<tr>
<td><em>Cheng Huanchong, Fan Xiumin, Zhu Minghua, Gu Yan, and Du Jiwang</em></td>
<td></td>
</tr>
<tr>
<td>Intelligent Virtual Environment Using Artificial Neural Networks</td>
<td>43</td>
</tr>
<tr>
<td><em>Sandra Mateus and John Branch</em></td>
<td></td>
</tr>
<tr>
<td>Digital Map Table VR: Bringing an Interactive System to Virtual Reality</td>
<td>54</td>
</tr>
<tr>
<td><em>Gunnar Strentzsch, Florian van de Camp, and Rainer Stiefelhagen</em></td>
<td></td>
</tr>
<tr>
<td>Understanding Where to Project Information on the Desk for Supporting Work with Paper and Pen</td>
<td>72</td>
</tr>
<tr>
<td><em>Mai Tokiwa and Kaori Fujinami</em></td>
<td></td>
</tr>
<tr>
<td>Methodology for the Estimation of Effort for a Project of Virtual Reality–A Case Study: Ennui.</td>
<td>82</td>
</tr>
<tr>
<td><em>Francisco Torres-Guerrero, Leticia Neira-Tovar, and Ignacio Martinez Garcia</em></td>
<td></td>
</tr>
</tbody>
</table>

### Interaction Techniques in VAMR

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of a Low Cost EMG Sensor as a Modality for Use in Virtual Reality Applications</td>
<td>97</td>
</tr>
<tr>
<td><em>S.N. Gieser, Varun Kanal, and Fillia Makedon</em></td>
<td></td>
</tr>
<tr>
<td>Vitty: Virtual Touch Typing Interface with Added Finger Buttons.</td>
<td>111</td>
</tr>
<tr>
<td><em>Yongjae Lee and Gerard J. Kim</em></td>
<td></td>
</tr>
<tr>
<td>Remote Touch: Humanizing Social Interactions in Technology Through Multimodal Interfaces</td>
<td>120</td>
</tr>
<tr>
<td><em>Alexia Mandeville, David Birnbaum, and Chad Sampanes</em></td>
<td></td>
</tr>
</tbody>
</table>
An Exploratory Comparison of the Visual Quality of Virtual Reality Systems Based on Device-Independent Testsets ........................................... 130
  Robert Manthey, Marc Ritter, Manuel Heinzig, and Danny Kowerko

Performance and User Preference of Various Functions for Mapping Hand Position to Movement Velocity in a Virtual Environment ............ 141
  Weizhi Nai, David Rempel, Yue Liu, Alan Barr, Carisa Harris-Adamson, and Yongtian Wang

The Pulse Breath Water System: Exploring Breathing as an Embodied Interaction for Enhancing the Affective Potential of Virtual Reality ....... 153
  Mirjana Prpa, Kivanç Tatar, Bernhard E. Riecke, and Philippe Pasquier

Visual Communication with UAS: Recognizing Gestures from an Airborne Platform .......................................................... 173
  Alexander Schelle and Peter Stütz

Subjective Evaluation of Tactile Fidelity for Single-Finger and Whole-Hand Touch Gestures .................................................. 185
  Fei Tang, Ryan P. McMahan, Eric D. Ragan, and Tandra T. Allen

VAMR in Education and Training

VoTrE: A Vocational Training and Evaluation System to Compare Training Approaches for the Workplace ........................................... 203
  Ashwin Ramesh Babu, Akilesh Rajavenkatanarayanan, Maher Abujelala, and Fillia Makedon

Effects of Instruction Methods on User Experience in Virtual Reality

Serious Games ........................................................................... 215
  Lal Bozgeyikli, Andrew Raij, Srinivas Katkoori, and Redwan Alqasemi

Mixed Library — Bridging Real and Virtual Libraries ................. 227
  Denis Gračanin, Andrew Ciambrone, Reza Tasooji, and Mohamed Handosa

Virtual Reality for Training Diagnostic Skills in Anorexia Nervosa:

A Usability Assessment ............................................................ 239
  Jose Gutierrez-Maldonado, Antonio Andres-Pueyo, Adolfo Jarne, Antoni Talarn, Marta Ferrer, and Joseba Achotegui

An Augmented Reality/Internet of Things Prototype for Just-in-time Astronaut Training ..................................................... 248
  John A. Karasinski, Richard Joyce, Colleen Carroll, Jack Gale, and Steven Hillenius
Contrasting Instructional Strategies Suited to a Detection Task: Examining Differences in Subjective Workload. 261
Crystal Maraj, Jonathan Hurter, William Aubrey, Elizabeth Wolfe, and Irwin Hudson

HoloLens for Assembly Assistance - A Focus Group Report 274
Rafael Radkowski and Jarid Ingebrand

Playing Both Sides: Analyzing Live-Action-Role-Play as a Method for Simulating Complex Technical Interactions 283
Marcel Schmittchen

Optimizing Performance Outcomes for Emergency Management Personnel Through Simulation Based Training Applications 302
Ronald W. Tarr

Development of a Mobile Tool for Dismounted Squad Team Performance Observations 312
Lisa Townsend, Joan Johnston, Bill Ross, Laura Milham, Dawn Riddle, Henry Phillips, and Brandon Woodhouse

Virtual Worlds and Games

Leveraging a Virtual Environment to Prepare for School Shootings 325
Tami Griffith, Jennie Ablanedo, and Tabitha Dwyer

SuperJam: Participatory Design for Accessible Games 339
Emily K. Johnson, Peter A. Smith, Matt Dombrowski, and Ryan Buyssens

User-Generated Accessibility in Virtual World Games 349
Don Merritt

Using Commercial Virtual Reality Games to Prototype Serious Games and Applications 359
Peter A. Smith

A Proposal for the Selection of Eye-Tracking Metrics for the Implementation of Adaptive Gameplay in Virtual Reality Based Games 369
Jose L. Soler-Dominguez, Jorge D. Camba, Manuel Contero, and Mariano Alcañiz

User Experience in VAMR

An Online User Analysis Regarding the Usage of Mobile Augmented and Virtual Reality Devices in the Field of Robotics 383
Micha Bläss and Carsten Wittenberg
The Application of Augmented Reality Technology on Museum Exhibition—
A Museum Display Project in Mawangdui Han Dynasty Tombs ................. 394
   Dong Han, Xujie Li, and Tianjiao Zhao

VIGOR: Virtual Interaction with Gravitational Waves to Observe Relativity . . 404
   Midori Kitagawa, Michael Kesden, Ngoc Tran,
   Thulasi Sivampillai Venlayudam, Mary Urquhart, and Roger Malina

A Virtual Reality Tool Applied to Improve the Effects on Chronic Diseases -
Case: Emotional Effects on T2DM ..................................................... 417
   Leticia Neira-Tovar and Ivan Castilla Rodriguez

Squad-Level Soldier-Robot Dynamics: Exploring Future Concepts
Involving Intelligent Autonomous Robots ........................................... 426
   Rodger Pettitt, Linda R. Elliott, and Clifford C. Swiecicki

Decoding the User Experience in Mobile Virtual Reality Narratives .......... 437
   Biswajit Sarker

ADVICE: Decision Support for Complex Geospatial Decision
Making Tasks ................................................................. 453
   Harvey S. Smallman and Cory A. Rieth

A Real-Time Professional Photographing Guiding System
Through Image Composition Analysis ................................................. 466
   Meng-Luen Wu and Chin-Shyurng Fahn

Breath Chair: Reduce Fear and Anxiety by Simulating
Breathing Movements .............................................................. 478
   Shunsuke Yanaka and Takayuki Kosaka

Health Issues in VR

VR Rio 360: The Challenges of Motion Sickness in VR Environments ...... 495
   Paulo Carvalho, Taynah Miyagawa, Fran Maciel, and Paulo Melo

Dispelling the Gorilla Arm Syndrome: The Viability of Prolonged
Gesture Interactions ............................................................. 505
   Jeffrey T. Hansberger, Chao Peng, Shannon L. Mathis,
   Vaidyanath Areyur Shanthakumar, Sarah C. Meacham, Lizhou Cao,
   and Victoria R. Blakely

Simulation Sickness Related to Virtual Reality Driving Simulation .......... 521
   Quinate Chioma Ihemedu-Steinke, Stanislava Rangelova,
   Michael Weber, Rainer Erbach, Gerrit Meixner, and Nicola Marsden
Virtual, Augmented and Mixed Reality
9th International Conference, VAMR 2017, Held as Part
of HCI International 2017, Vancouver, BC, Canada, July
9-14, 2017, Proceedings
Lackey, S.; Chen, J. (Eds.)
2017, XIX, 568 p. 270 illus., Softcover
ISBN: 978-3-319-57986-3