

Table of Contents

Part I: Interaction and Navigation in Virtual and Mixed Environments

The 'H' in HCI: Enhancing Perception of Interaction through the Performative	3
<i>Simon Biggs, Mariza Dima, Henrik Ekeus, Sue Hawksley, Wendy Timmons, and Mark Wright</i>	
Advanced Interaction Techniques for Augmented Reality Applications.....	13
<i>Mark Billingham, Hirokazu Kato, and Seiko Myojin</i>	
Methods for Quantifying Emotion-Related Gait Kinematics	23
<i>Elizabeth Crane, Melissa Gross, and Ed Rothman</i>	
Towards an Advanced Framework for Whole Body Interaction	32
<i>David England, Martin Randles, Paul Fergus, and A. Taleb-Bendiab</i>	
Evaluation of Body Sway and the Relevant Dynamics While Viewing a Three-Dimensional Movie on a Head-Mounted Display by Using Stabilograms	41
<i>Kazuhiro Fujikake, Masaru Miyao, Tomoki Watanabe, Satoshi Hasegawa, Masako Omori, and Hiroki Takada</i>	
Estimation of User Interest from Face Approaches Captured by Webcam	51
<i>Kumiko Fujisawa and Kenro Aihara</i>	
Spatial Navigation in a Virtual Multilevel Building: The Role of Exocentric View in Acquiring Survey Knowledge	60
<i>Zhiqiang Luo, Henry Been-Lirn Duh, I-Ming Chen, and Wenshu Luo</i>	
A Real-World Pointing Device Based on an Optical Communication System	70
<i>Yuichi Mitsudo</i>	
VR Based Movie Watching Method by Reproduction of Spatial Sensation	80
<i>Kunihiro Nishimura, Aoi Ito, Tomohiro Tanikawa, and Michitaka Hirose</i>	
Comparison of Measurement of Accommodation between LCD and CRT at the Stereoscopic Vision Gaze	90
<i>Masako Omori, Satoshi Hasegawa, Tomoyuki Watanabe, Kazuhiro Fujikake, and Masaru Miyao</i>	

Is Embodied Interaction Beneficial When Learning Programming?	97
<i>Pablo Romero, Benedict du Boulay, Judy Robertson, Judith Good, and Katherine Howland</i>	
Mobile Interfaces Using Body Worn Projector and Camera	106
<i>Nobuchika Sakata, Teppei Konishi, and Shogo Nishida</i>	
Relationship between Physiological Indices and a Subjective Score in Evaluating Visually Induced Motion Sickness	114
<i>Norihiro Sugita, Makoto Yoshizawa, Akira Tanaka, Makoto Abe, Shigeru Chiba, Tomoyuki Yambe, and Shin-ichi Nitta</i>	
Effect of a Stereoscopic Movie on the Correlation between Head Acceleration and Body Sway	120
<i>Hiroki Takada, Tetsuya Yamamoto, Masaru Miyao, Tatehiko Aoyama, Masashi Furuta, and Tomoki Shiozawa</i>	
AR City Representation System Based on Map Recognition Using Topological Information	128
<i>Hideaki Uchiyama, Hideo Saito, Myriam Servières, and Guillaume Moreau</i>	
Estimation of Visually Induced Motion Sickness from Velocity Component of Moving Image	136
<i>Hiroyasu Ujike</i>	

Part II: Design, Development and Evaluation of VR Environments

Supporting Reusability of VR and AR Interface Elements and Interaction Techniques	145
<i>Wolfgang Broll and Jan Herling</i>	
Development of 3D Avatars for Professional Education	154
<i>Miglena Dontschewa, Andreas Künz, and Sabahat Kovanci</i>	
Rapidly Prototyping Marker Based Tangible User Interfaces	159
<i>Maribeth Gandy, Brian Jones, Scott Robertson, Tiffany O'Quinn, and Amos Johnson</i>	
Evaluation of Non-photorealistic 3D Urban Models for Mobile Device Navigation	169
<i>Christos Gatzidis, Vesna Brujic-Okretic, and Maria Mastroianni</i>	
Integrating and Delivering Sound Using Motion Capture and Multi-tiered Speaker Placement	179
<i>Darin E. Hughes</i>	

The Design of a Virtual Trailblazing Tool	186
<i>Daniel Iaboni and Carolyn MacGregor</i>	
User-Centered Evaluation of a Virtual Environment Training System: Utility of User Perception Measures	196
<i>Dawei Jia, Asim Bhatti, Chris Mawson, and Saeid Nahavandi</i>	
Emergent Design: Serendipity in Digital Educational Games	206
<i>Michael D. Kickmeier-Rust and Dietrich Albert</i>	
Intuitive Change of 3D Wand Function in Surface Design	216
<i>Sang-Hun Nam, Hark-Su Kim, and Young-Ho Chai</i>	
Software-Agents for On-Demand Authoring of Mobile Augmented Reality Applications	225
<i>Rafael Radkowski</i>	
Multiuser Collaborative Exploration of Immersive Photorealistic Virtual Environments in Public Spaces	235
<i>Scott Robertson, Brian Jones, Tiffany O'Quinn, Peter Presti, Jeff Wilson, and Maribeth Gandy</i>	
A Design Method for Next Generation User Interfaces Inspired by the Mixed Reality Continuum	244
<i>Jörg Stöcklein, Christian Geiger, Volker Paelke, and Patrick Pogscheba</i>	
On a Qualitative Method to Evaluate Motion Sickness Induced by Stereoscopic Images on Liquid Crystal Displays	254
<i>Hiroki Takada, Kazuhiro Fujikake, and Masaru Miyao</i>	
Balancing Design Freedom and Constraints in Wall Posters Masquerading as AR Tracking Markers	263
<i>Ryuhei Tenmoku, Akito Nishigami, Fumihisa Shibata, Asako Kimura, and Hideyuki Tamura</i>	
Development of RFID Textile and Human Activity Detection Applications	273
<i>Ryoko Ueoka, Atsuji Masuda, Tetsuhiko Murakami, Hideyuki Miyayama, Hidenori Takeuchi, Kazuyuki Hashimoto, and Michitaka Hirose</i>	
A Study on the Design of Augmented Reality User Interfaces for Mobile Learning Systems in Heritage Temples	282
<i>Kuo-Hsiung Wang, Li-Chieh Chen, Po-Ying Chu, and Yun-Maw Cheng</i>	

Part III: Haptics and Tactile Interaction in VR

Haptic Interaction and Interactive Simulation in an AR Environment for Aesthetic Product Design	293
<i>Monica Bordegoni, Francesco Ferrise, and Marco Ambrogio</i>	
Evaluation of a Haptic-Based Interaction System for Virtual Manual Assembly	303
<i>Monica Bordegoni, Umberto Cugini, Paolo Belluco, and Marcello Aliverti</i>	
Transmission of Information through Haptic Interaction	313
<i>Koichi Hirota and Yuichiro Sekiguchi</i>	
Development of Realistic Haptic Presentation Media	318
<i>Yasushi Ikei</i>	
Analysis of Tactual Impression by Audio and Visual Stimulation for User Interface Design in Mixed Reality Environment	326
<i>Mami Kagimoto, Asako Kimura, Fumihisa Shibata, and Hideyuki Tamura</i>	
Fundamental Research on Tactile Perception for Development of a Tactile Feel Display	336
<i>Iyo Kunimoto, Naoki Saiwaki, Osamu Katayama, and Yasuji Inobe</i>	
Enhanced Industrial Maintenance Work Task Planning by Using Virtual Engineering Tools and Haptic User Interfaces	346
<i>Simo-Pekka Leino, Salla Lind, Matthieu Poyade, Sauli Kiviranta, Petteri Multanen, Arcadio Reyes-Lecuona, Ari Mäkiranta, and Ali Muhammad</i>	
Characterizing the Space by Thermal Feedback through a Wearable Device	355
<i>Takuji Narumi, Akagawa Tomohiro, Young Ah Seong, and Michitaka Hirose</i>	
A High-Level Haptic Interface for Enhanced Interaction within Virtools TM	365
<i>Matthieu Poyade, Arcadio Reyes-Lecuona, Simo-Pekka Leino, Sauli Kiviranta, Raquel Viciano-Abad, and Salla Lind</i>	
A Study of the Attenuation in the Properties of Haptic Devices at the Limit of the Workspace	375
<i>Jose San Martin</i>	
A Virtual Button with Tactile Feedback Using Ultrasonic Vibration . . .	385
<i>Kaoru Tashiro, Yuta Shiokawa, Tomotake Aono, and Takashi Maeno</i>	

Enhancing Haptic Rendering through Predictive Collision Detection	394
<i>Athanasios Vogianou, Konstantinos Moustakas,</i> <i>Dimitrios Tzovaras, and Michael G. Strintzis</i>	

Part IV: Vision in Virtual and Mixed Reality

Shape Disparity Inspection of the Textured Object and Its Notification by Overlay Projection	405
<i>Toshiyuki Amano and Hirokazu Kato</i>	
Complemental Use of Multiple Cameras for Stable Tracking of Multiple Markers	413
<i>Yuki Arai and Hideo Saito</i>	
AR Display for Observing Sports Events Based on Camera Tracking Using Pattern of Ground	421
<i>Akihito Enomoto and Hideo Saito</i>	
Interactive Fluid Simulation Using Augmented Reality Interface	431
<i>Makoto Fujisawa and Hirokazu Kato</i>	
Lens Accommodation to the Stereoscopic Vision on HMD	439
<i>Satoshi Hasegawa, Masako Omori, Tomoyuki Watanabe,</i> <i>Kazuhiro Fujikake, and Masaru Miyao</i>	
Acquiring a Physical World and Serving Its Mirror World Simultaneously	445
<i>Seungpyo Hong, Jong-gil Ahn, Heedong Ko, and Jinwook Kim</i>	
In-Situ 3D Indoor Modeler with a Camera and Self-contained Sensors	454
<i>Tomoya Ishikawa, Kalaivani Thangamani, Masakatsu Kourogi,</i> <i>Andrew P. Gee, Walterio Mayol-Cuevas, Keechul Jung, and</i> <i>Takeshi Kurata</i>	
Evaluation of Visually-Controlled Task Performance in Three Dimension Virtual Reality Environment	465
<i>Chiuhsiang Joe Lin, Tien-Lung Sun, Hung-Jen Chen, and</i> <i>Ping-Yun Cheng</i>	
Visual Data Mining in Immersive Virtual Environment Based on 4K Stereo Images	472
<i>Tetsuro Ogi, Yoshisuke Tateyama, and So Sato</i>	
MR-Mirror: A Complex of Real and Virtual Mirrors	482
<i>Hideaki Sato, Itaru Kitahara, and Yuichi Ohta</i>	

A Novel Approach to On-Site Camera Calibration and Tracking for
MR Pre-visualization Procedure 492
*Wataru Toishita, Yutaka Momoda, Ryuhei Tenmoku,
Fumihisa Shibata, Hideyuki Tamura, Takafumi Taketomi,
Tomokazu Sato, and Naokazu Yokoya*

Robust Hybrid Tracking with Life-Size Avatar in Mixed Reality
Environment 503
*Qui Cong Thien Tran, Shang Ping Lee, W. Russell Pensyl, and
Daniel Jernigan*

Part V: VR Applications

Collaboration Design System Using Internet and Virtual Reality
Technology 513
Hideki Aoyama and Rie Iida

Evaluating the Potential of Cognitive Rehabilitation with Mixed
Reality 522
*Nicholas Beato, Daniel P. Mapes, Charles E. Hughes,
Cali Fidopiastis, and Eileen Smith*

Augmented Reality Video See-through HMD Oriented to Product
Design Assessment 532
Giandomenico Caruso and Umberto Cugini

Mixed Reality Neurosurgical Microscope for Training and
Intra-operative Purposes 542
*Alessandro De Mauro, Joerg Raczekowsky, Marc Eric Halatsch, and
Heinz Wörn*

A Real-Virtual Mapping Method for Mechanical Product Assembly
Process Planning in Virtual Assembly Environment 550
Xiumin Fan, Feng Gao, Hongmin Zhu, Dianliang Wu, and Qi Yin

Rebalancing the Visual System of People with Amblyopia “Lazy Eye”
by Using HMD and Image Enhancement 560
Sina Fateh and Claude Speeg

A Two-User Framework for Rapid Immersive Full Cycle Product
Customization 566
Maxim Foursa, David d’Angelo, Gerold Wesche, and Manfred Bogen

A Mixed Reality-Based Assembly Verification and Training Platform ... 576
Shiqi Li, Tao Peng, Chi Xu, Yan Fu, and Yang Liu

Trial of Formulating Affordance Features for Product Design 586
Tamotsu Murakami, Mariko Higuchi, and Hideyoshi Yanagisawa

An Empirical Study of Assembly Error Detection Using an Augmented Vision System	596
<i>Barbara Odenthal, Marcel Ph. Mayer, Wolfgang Kabuß, Bernhard Kausch, and Christopher M. Schlick</i>	
Design and Implementation of Augmented Reality Environment for Complex Anatomy Training: Inguinal Canal Case Study	605
<i>Sophia Sakellariou, Ben M. Ward, Vassilis Charissis, David Chanock, and Paul Anderson</i>	
The Use of Virtual Reality in the Treatment of Posttraumatic Stress Disorder (PTSD)	615
<i>Deanne C. Simms, Susan O'Donnell, and Heather Molyneaux</i>	
Effect of an Eyesight Recovering Stereoscopic Movie System on Visual Acuity and Asthenopia	625
<i>Akihiro Sugiura, Tetsuya Yamamoto, Hiroki Takada, and Masaru Miyao</i>	
Augmented Reality System for Dental Implant Surgery	633
<i>Satoshi Yamaguchi, Takafumi Ohtani, Hirofumi Yatani, and Taiji Sohmura</i>	
A Feasible Tracking Method of Augmented Reality for Supporting Fieldwork of Nuclear Power Plant	639
<i>Weida Yan, Hirotake Ishii, Hiroshi Shimoda, and Masanori Izumi</i>	
Author Index	647