

2016 IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2016)

**Merida, Yucatan, Mexico
19-23 September 2016**



**IEEE Catalog Number: CFP16MAR-POD
ISBN: 978-1-5090-3642-4**

**Copyright © 2016 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16MAR-POD
ISBN (Print-On-Demand):	978-1-5090-3642-4
ISBN (Online):	978-1-5090-3641-7
ISSN:	1554-7868

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

2016 IEEE International Symposium on Mixed and Augmented Reality

ISMAR 2016

Table of Contents

Message from the ISMAR 2016 General Chair and Deputy General Chairs	viii
Message from the ISMAR 2016 Science and Technology Program Chairs and TVCG Guest Editors	ix
Message from the ISMAR 2016 Science and Technology Program Chairs.....	x
Message from the ISMAR 2016 Science and Technology Poster Chairs	xii
Message from the Workshop and Tutorial Chairs.....	xiv
Message from the Demonstration Chairs	xv
Message from the Hackathon Chairs.....	xvi
ISMAR 2016 Conference Committee Members	xvii
ISMAR 2016 Science and Technology Program Committee Members.....	xviii
ISMAR 2016 Steering Committee Members	xix
Reviewers.....	xx
Keynotes.....	xxi
Sponsors and Supporters	xxiii

Science & Technology Papers

Session: SLAM Tracking

Robust Keyframe-based Monocular SLAM for Augmented Reality	1
<i>Haomin Liu, Guofeng Zhang, and Hujun Bao</i>	
Leveraging the User's Face for Absolute Scale Estimation in Handheld Monocular SLAM.....	11
<i>Sebastian B. Knorr and Daniel Kurz</i>	
σ -DVO: Sensor Noise Model Meets Dense Visual Odometry	18
<i>Benzun Wisely Babu, Soohwan Kim, Zhixin Yan, and Liu Ren</i>	

Session: Lighting and Rendering

Instant Mixed Reality Lighting from Casual Scanning.....	27
<i>Thomas Richter-Trummer, Denis Kalkofen, Jinwoo Park, and Dieter Schmalstieg</i>	
A Single Camera Image Based Approach for Glossy Reflections in Mixed Reality Applications	37
<i>Tobias Schwandt and Wolfgang Broll</i>	

An Empirical Model for Specularity Prediction with Application to Dynamic Retexturing.....	44
<i>Alexandre Morgand, Mohamed Tamaazousti, and Adrien Bartoli</i>	

Edge Snapping-Based Depth Enhancement for Dynamic Occlusion Handling in Augmented Reality	54
<i>Chao Du, Yen-Lin Chen, Mao Ye, and Liu Ren</i>	

Session: Calibration and Tracking

TVCG Special Section Paper

Spatio-Temporal Point Path Analysis and Optimization of a Galvanoscopic Scanning Laser Projector

Simon Willi and Anselm Grundhöfer

Practical and Precise Projector-Camera Calibration	63
<i>Liming Yang, Jean-Marie Normand, and Guillaume Moreau</i>	

TVCG Special Section Paper

Towards Kilo-Hertz 6-DoF Visual Tracking Using an Egocentric Cluster of Rolling Shutter Cameras

Akash Bapat, Enrique Dunn, and Jan-Michael Frahm

Learning to Fuse: A Deep Learning Approach to Visual-Inertial Camera Pose Estimation	71
<i>Jason R. Rambach, Aditya Tewari, Alain Pagani, and Didier Stricker</i>	

Session: Collaboration and Interaction

PPV: Pixel-Point-Volume Segmentation for Object Referencing in Collaborative Augmented Reality	77
<i>Kuo-Chin Lien, Benjamin Nuernberger, Tobias Höllerer, and Matthew Turk</i>	

TVCG Special Section Paper

Do You See What I See? The Effect of Gaze Tracking on Task Space Remote Collaboration

Kunal Gupta, Gun A. Lee, and Mark Billinghurst

Analysis of Medium Wrap Freehand Virtual Object Grasping in Exocentric Mixed Reality	84
<i>Maadh Al-Kalbani, Ian Williams, and Maite Frutos-Pascual</i>	

Session: Head-Mounted Displays

TVCG Special Section Paper

Real-Time Radiometric Compensation for Optical See-Through Head-Mounted Displays

Tobias Langlotz, Matthew Cook, and Holger Regenbrecht

Automated Spatial Calibration of HMD Systems with Unconstrained Eye-Cameras	94
<i>Alexander Plopski, Jason Orlosky, Yuta Itoh, Christian Nitschke, Kiyoshi Kiyokawa, and Gudrun Klinker</i>	

TVCG Special Section Paper

Gaussian Light Field: Estimation of Viewpoint-Dependent Blur for Optical See-Through

Head-Mounted Displays..... N/A

Yuta Itoh, Toshiyuki Amano, Daisuke Iwai, and Gudrun Klinker

Session: Education and Modeling

TactileVR: Integrating Physical Toys into Learn and Play Virtual Reality Experiences	100
<i>Lior Shapira, Judith Amores, and Xavier Benavides</i>	

The Influence of using Augmented Reality on Textbook Support for Learners of Different Learning Styles	107
<i>Jia Zhang, Amy Ogan, Tzu-Chien Liu, Yao-Ting Sung, and Kuo-En Chang</i>	

TVCG Special Section Paper

Retargeting Human-Object Interaction to Virtual Avatars <i>Yeonjoon Kim, Hangil Park, Seungbae Bang, and Sung-Hee Lee</i>	
Reality Skins: Creating Immersive and Tactile Virtual Environments	115
<i>Lior Shapira and Daniel Freedman</i>	

AR Everywhere

Augmented Reality 3D Discrepancy Check in Industrial Applications	125
<i>Oliver Wasenmüller, Marcel Meyer, and Didier Stricker</i>	

TVCG Special Section Paper

A Real-time Augmented Reality System to See-Through Cars <i>François Rameau, Hyowon Ha, Kyungdon Joo, Jinsoo Choi, Kibaek Park, and In So Kweon</i>	
--	--

TVCG Conference Partner Presentation (Preprint – DOI 10.1109/TVCG.2016.2543720)

Towards Pervasive Augmented Reality: Context-Awareness in Augmented Reality <i>Jens Grubert, Tobias Langlotz, Stefanie Zollmann, and Holger Regenbrecht</i>	
--	--

Author Index	135
--------------------	-----