

Emerging Technologies of Augmented Reality: Interfaces and Design

Table of Contents

Preface.....	vi
 Section I: Introduction to Technologies that Support Augmented Reality	
 Chapter I	
Vision Based 3D Tracking and Pose Estimation for Mixed Reality	1
<i>Pascal Fua, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland</i>	
<i>Vincent Lepetit, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland</i>	
 Chapter II	
Developing AR Systems in the Presence of Spatial Uncertainty.....	23
<i>Cindy M. Robertson, Georgia Institute of Technology, TSRB, USA</i>	
<i>Ennylon Machado Coelho, Georgia Institute of Technology, TSRB, USA</i>	
<i>Blair MacIntyre, Georgia Institute of Technology, TSRB, USA</i>	
<i>Simon Julier, Naval Research Laboratory, USA</i>	
 Chapter III	
An Introduction to Head Mounted Displays for Augmented Reality	43
<i>Kiyoshi Kiyokawa, Osaka University, Japan</i>	
 Chapter IV	
Projector-Based Augmentation.....	64
<i>Oliver Bimber, Bauhaus University, Germany</i>	

Chapter V

Mobile Phone Based Augmented Reality.....	90
--	-----------

Anders Henrysson, Norrköping Visualisation and Interaction Studio, Sweden

Mark Ollila, Norrköping Visualisation and Interaction Studio, Sweden

Mark Billinghurst, Human Interface Technology Laboratory New Zealand

Chapter VI

Representing and Processing Screen Space in Augmented Reality.....	110
---	------------

Blaine Bell, Columbia University, USA

Steven Feiner, Columbia University, USA

Section II: Augmented Reality Development Environments

Chapter VII

Abstraction and Implementation Strategies for Augmented Reality
--

Authoring.....	138
-----------------------	------------

Florian Ledermann, Vienna University of Technology, Austria

István Barakonyi, Graz University of Technology, Austria

Dieter Schmalstieg, Vienna University of Technology, Austria

Chapter VIII

Supporting Early Design Activities for AR Experiences.....	160
---	------------

Maribeth Gandy, Georgia Institute of Technology, USA

Blair MacIntyre, Georgia Institute of Technology, USA

Steven Dow, Georgia Institute of Technology, USA

Jay David Bolter, Georgia Institute of Technology, USA

Chapter IX

Real-Time 3D Design and Modelling of Outdoor Structures Using Mobile

Augmented Reality Systems.....	181
---------------------------------------	------------

Wayne Piekarski, University of South Australia, Australia

Chapter X

The Evolution of a Framework for Mixed Reality Experiences.....	198
--	------------

Charles E. Hughes, University of Central Florida, USA

Christopher B. Stapleton, Simiosys LLC, USA

Matthew R. O'Connor, University of Central Florida, USA

Section III: Interface Design and Evaluation of Augmented Reality Applications

Chapter XI

Lessons Learned in Designing Ubiquitous Augmented Reality User

Interfaces	218
-------------------------	------------

Christian Sandor, Technische Universität München, Germany

Gudrun Klinker, Technische Universität München, Germany

Chapter XII	
Human Communication in Collaborative Augmented Reality Systems.....	236
<i>Kiyoshi Kiyokawa, Osaka University, Japan</i>	
Chapter XIII	
Interaction Design for Tangible Augmented Reality Applications	261
<i>Gun A. Lee, Electronics and Telecommunications Research Institute, Korea</i>	
<i>Gerard J. Kim, Korea University, Korea</i>	
<i>Mark Billinghurst, Human Interface Technology Laboratory, New Zealand</i>	
 Section IV: Case Studies of Augmented Reality Applications	
Chapter XIV	
Industrial Augmented Reality Applications	283
<i>Holger Regenbrecht, University of Otago, New Zealand</i>	
Chapter XV	
Creating Augmented Virtual Environments.....	305
<i>Ulrich Neumann, University of Southern California, USA</i>	
<i>Suya You, University of Southern California, USA</i>	
Chapter XVI	
Making Memories of a Lifetime	329
<i>Christopher B. Stapleton, Simiosys LLC, USA</i>	
<i>Charles E. Hughes, University of Central Florida, USA</i>	
Chapter XVII	
Social and Physical Interactive Paradigms for Mixed Reality Entertainment ...	352
<i>Adrian David Cheok, National University of Singapore, Singapore</i>	
Chapter XVIII	
The Future of Augmented Reality Gaming	367
<i>Bruce H. Thomas, Wearable Computer Laboratory, University of South Australia, Australia</i>	
About the Authors.....	384
Index	391