2008 12th IEEE International Symposium on Wearable Computers

(ISWC)

Pittsburgh, Pennsylvania, USA 28 September - 1 October 2008



IEEE Catalog Number: ISBN:

CFP08152-PRT 978-1-4244-4891-3

Table of Contents

Twelfth IEEE International Symposium on Wearable Computers (ISWC 2008)

Message from the General Chair	
Message from the Program Chairs	
The Technical Committee on Wearable Information Systems	
Organizing Committee	
Program Committee	
Guest Reviewers	
Sponsors	
Session 1: Location Mapping	
HeadSLAM - Simultaneous Localization and Mapping with Head-Mounted Inertial and Laser Range Sensors	_ 3
Localization and 3D Reconstruction of Urban Scenes Using GPS	_ 11
Kihwan Kim, Jay Summet, Thad Starner, Daniel Ashbrook, Mrunal Kapade and Irfan Essa	
Video-rate Localization in Multiple Maps for Wearable Augmented Reality Robert Castle, Georg Klein and David W. Murray	_ 15
Session 2: Mobile Phones and Human Interface	
Determining Transportation Mode On Mobile Phones Sasank Reddy, Jeff Burke, Deborah Estrin, Mark Hansen and Mani Srivastava	_ 25
Discovering Human Routines from Cell Phone Data with Topic Models Katayoun Farrahi and Daniel Gatica-Perez	_ 29
A new Approach to Enable Gesture Recognition in Continuous Data Streams Andreas Zinnen and Bernt Schiele	_ 33
PianoTouch: A Wearable Haptic Piano Instruction System For Passive Learning of Piano Skills	_ 4]
Session 3: Activity Recognition	
Adapting Magnetic Resonant Coupling Based Relative Positioning Technology for Wearable Activitiy Recogniton	47
Gerald Pirkl, Karl Stockinger, Kai Kunze and Paul Lukowicz	
Using a complex Multi-modal On-body Sensor System for Activity Spotting	_ 55
Using Rhythm Awareness in Long-Term Activity Recognition Kristof Van Laerhoven, David Kilian and Bernt Schiele	_ 63
Session 4: Activity Support	
Sustained Logging and Discrimination of Sleep Postures with Low-Level, Wrist-Worn Sensors Kristof Van Laerhoven, Marko Borazio, David Kilian and Bernt Schiele	_ 69

Towards a Virtual Coach for manual wheelchair users Prime French Dinns Transport de David D. Significant Asia, Smail asia and Dav Dinns	
Brian French, Divya Tyamagundlu, Daniel P. Siewiorek, Asim Smailagic and Dan Ding	
Exploring Semi-Supervised and Active Learning for Activity Recognition Maja Stikic, Kristof Van Laerhoven and Bernt Schiele	81
Session 5: Power and System Integration	
PowerPACK: A Wireless Power Distribution System for Wearable Devices	91
SwitchR: Reducing System Power Consumption in a Multi-Client Multi-Radio Environment Yuvraj Agarwal, Trevor Pering, Roy Want and Rajesh Gupta	99
Posters	
Lightweight Hand and Arm Tracking for Mobile Augmented Reality	105
Wearable Experience Capture for Episodic Memory Support	107
Rapid Prototyping for Wearable Computing	109
Scheming Textiles: End-user Programming for Wearables Nwanua Elumeze and Michael Eisenberg	111
AstroWheelie: A wheelchair based exercise game	113
Stop Burdening Your Eyes: A Wearable Electro-Tactile Display	115
Walk the Walk, Talk the Talk Hélène D. Fraser, Sidney Fels and Robert Pritchard	117
Wearable Context-Aware Food Recognition for Calorie Monitoring	119
Suggestion for Optimal Location of Textile-based ECG Electrodes on an Elastic Shirts Considering Clothing Pressure of the Shirt Moonsoo Sung, Keesam Jeong and Gilsoo Cho	121
Tutorials and Workshop	
Wearability in Wearable Computers	125
Sensing and actuation: End-to-end wireless systems design for mission critical applications	126
Relative Positioning Technology	127
The Role of Design inWearable Computing	128
Author Index	129