

# **2010 Canadian Conference on Computer and Robot Vision**

## **(CRV 2010)**

**Ontario, Canada**  
**31 May – 2 June 2010**



**IEEE Catalog Number: CFP10347-PRT**  
**ISBN: 978-1-4244-6963-5**

# 2010 Canadian Conference Computer and Robot Vision

## CRV 2010

### Table of Contents

<b>Preface</b> .....	ix
<b>Program Committee</b> .....	xi
<b>Additional Reviewers</b> .....	xv

---

#### Session 1

Probabilistic Framework for Feature-Point Matching .....	1
<i>Ron Tal and Minas E. Spetsakis</i>	
A PCA-Based Binning Approach for Matching to Large SIFT Database .....	9
<i>Geoffrey Treen and Anthony Whitehead</i>	
Matching Maximally Stable Extremal Regions Using Edge Information and the Chamfer Distance Function .....	17
<i>Pantelis Elinas</i>	
Quasi-Random Scale Space Approach to Robust Keypoint Extraction in High-Noise Environments .....	25
<i>Alexander Wong, Akshaya Mishra, David A. Clausi, and Paul Fieguth</i>	

#### Session 2

Bayesian Identity Clustering .....	32
<i>Simon J.D. Prince and James H. Elder</i>	
Automated Classification of Operational SAR Sea Ice Images .....	40
<i>Shuhrat Ochilov and David A. Clausi</i>	
Efficient Augmentation of the EKF Structure from Motion with Frame-to-Frame Features .....	47
<i>Adel H. Fakih and John S. Zelek</i>	
Real-Time Virtual Viewpoint Generation on the GPU for Scene Navigation .....	55
<i>Shanat Kolhatkar and Robert Laganière</i>	

## Poster Session I

A Simple but Effective Approach to Video Copy Detection .....	63
<i>Gerhard Roth, Robert Laganière, Patrick Lambert, Ilias Lakhmiri, and Tarik Janati</i>	
Texture Classification Using Compressed Sensing .....	71
<i>Li Liu and Paul Fieguth</i>	
The Effect of Colour Space on Image Sharpening Algorithms .....	79
<i>Michael Wirth and Denis Nikitenko</i>	
Automated Filter Parameter Selection Using Measures of Noisiness .....	86
<i>Ajit Rajwade, Anand Rangarajan, and Arunava Banerjee</i>	
Organ Recognition Using Gabor Filters .....	94
<i>Shiva Zaboli, Arash Tabibiazar, and Paul Fieguth</i>	
Multispectral Face Recognition in Texture Space .....	101
<i>Abdelhakim Bendada and Moulay A. Akhloufi</i>	
Curious George: An Integrated Visual Search Platform .....	107
<i>David Meger, Marius Muja, Scott Helmer, Ankur Gupta, Catherine Gamroth, Tomas Hoffman, Matthew Baumann, Tristram Southey, Pooyan Fazli, Walter Wohlkinger, Pooja Viswanathan, James J. Little, David G. Lowe, and James Orwell</i>	
Automatic Position Registration of Street-level Fisheye Images into Aerial Image Using Line Structures and Mutual Information .....	115
<i>Mehrnaz Zouqi, Jagath Samarabandu, and Yanbo Zhou</i>	
Extracting Outlined Planar Clusters of Street Facades from 3D Point Clouds .....	122
<i>Karim Hammoudi, Fadi Dornaika, Bahman Soheilian, and Nicolas Paparoditis</i>	
Matching Images Using Invariant Level-line Primitives under Projective Transformation .....	130
<i>Yasser Almechio and Samia Bouchafa</i>	
Semi-Automatic Prediction of Landmarks on Human Models in Varying Poses .....	136
<i>Stefanie Wuhrer, Zouhour Ben Azouz, and Chang Shu</i>	
Probabilistic Tracking of Pedestrian Movements via In-Floor Force Sensing .....	143
<i>Rishi Rajalingham, Yon Visell, and Jeremy R. Cooperstock</i>	
Human Tracking Using Spatialized Multi-level Histogram and Mean Shift .....	151
<i>Amir-Hossein Shabani, Mohammad Hossein Ghaemina, and Shahryar Baradaran Shokouhi</i>	

## Session 3

Selecting and Commanding Individual Robots in a Multi-Robot System .....	159
<i>Alex Couture-Beil, Richard T. Vaughan, and Greg Mori</i>	
Flame Region Detection Based on Histogram Backprojection .....	167
<i>Michael Wirth and Ryan Zaremba</i>	
Water Flow Detection in a Handwashing Task .....	175
<i>Babak Taati, Jasper Snoek, David Giesbrecht, and Alex Mihailidis</i>	

## Session 4

Binocular Camera Calibration Using Rectification Error .....	183
<i>Derek Bradley and Wolfgang Heidrich</i>	
Rough Terrain Reconstruction for Rover Motion Planning .....	191
<i>David Gingras, Tom Lamarche, Jean-Luc Bedwani, and Érick Dupuis</i>	
A Comparison of the EKF, SPKF, and the Bayes Filter for Landmark-Based Localization .....	199
<i>Chi Hay Tong and Timothy D. Barfoot</i>	
Multi-Layer Atlas System for Map Management .....	207
<i>Jean-Luc Bedwani, Ioannis Rekleitis, François Michaud, and Érick Dupuis</i>	

## Poster Session II

A Computer Vision System for Analyzing and Interpreting the Cephalo-ocular Behavior of Drivers in a Simulated Driving Context .....	215
<i>S. Metari, F. Prel, T. Moszkowicz, D. Laurendeau, N. Teasdale, and S. Beauchemin</i>	
An Accurate Image Processing Algorithm for Detecting FISH Probe Locations Relative to Chromosome Landmarks on DAPI Stained Metaphase Chromosome Images .....	223
<i>Akila Subasinghe A., Jagath Samarabandu, Joan Knoll, Wahab Khan, and Peter Rogan</i>	
Thermal Imaging as a Way to Classify Cognitive Workload .....	231
<i>John Stemberger, Robert S. Allison, and Thomas Schnell</i>	
Retina Vessel Detection Using Fuzzy Ant Colony Algorithm .....	239
<i>Sina Hooshyar and Rasoul Khayati</i>	
Robot Localization in Rough Terrains: Performance Evaluation .....	245
<i>Ehsan Fazl-Ersi and John K. Tsotsos</i>	
The Sentinel Problem for a Multi-hop Sensor Network .....	253
<i>Dimitri Marinakis and Sue Whitesides</i>	
Telepresence across the Ocean .....	261
<i>Ioannis Rekleitis, Gregory Dudek, Yasmina Schoueri, Philippe Giguere, and Junaed Sattar</i>	
Fall in! Sorting a Group of Robots with a Continuous Controller .....	269
<i>Yaroslav Litus and Richard T. Vaughan</i>	
Deformable Object Segmentation and Contour Tracking in Image Sequences Using Unsupervised Networks .....	277
<i>Ana-Maria Cretu, Emil M. Petriu, Pierre Payeur, and Fouad F. Khalil</i>	

## Session 5

Unsupervised Feature Selection and Learning for Image Segmentation .....	285
<i>Mohand Saïd Allili, Djemel Ziou, Nizar Bouguila, and Sabri Boutemedjet</i>	
Decoupled Active Surface for Volumetric Image Segmentation .....	293
<i>A. Mishra, P.W. Fieguth, and D.A. Clausi</i>	

A Bayesian Information Flow Approach to Image Segmentation .....	301
<i>Akshaya Mishra, Alexander Wong, David A. Clausi, and Paul Fieguth</i>	
Global Context Descriptors for SURF and MSER Feature Descriptors .....	309
<i>Gail Carmichael, Robert Laganière, and Prosenjit Bose</i>	
<b>Session 6</b>	
Construction of a 3D Model of Real-world Object Using Range Intensity	
Images .....	317
<i>Masato Kusanagi, Kenji Terabayashi, Kazunori Umeda, Guy Godin, and Marc Rioux</i>	
Automated Place Classification Using Object Detection .....	324
<i>Pooja Viswanathan, Tristram Southey, James J. Little, and Alan Mackworth</i>	
Window-Based Range Flow with an Isometry Constraint .....	331
<i>Ting Yu and Jochen Lang</i>	
Mammogram Image Superresolution Based on Statistical Moment Analysis .....	339
<i>Alexander Wong, Akshaya Mishra, David A. Clausi, and Paul Fieguth</i>	
<b>Session 7</b>	
Max-Margin Offline Pedestrian Tracking with Multiple Cues .....	347
<i>Bahman Yari Saeed Khanloo, Ferdinand Stefanus, Mani Ranjbar, Ze-Nian Li, Nicolas Saunier, Tarek Sayed, and Greg Mori</i>	
Object Inter-camera Tracking with Non-overlapping Views: A New Dynamic Approach .....	354
<i>Trevor Montcalm and Bubaker Boufama</i>	
<b>Session 8</b>	
Human Action Recognition Using Salient Opponent-Based Motion Features .....	362
<i>Amir-Hossein Shabani, John S. Zelek, and David A. Clausi</i>	
Human Upper Body Pose Recognition Using Adaboost Template for Natural Human Robot Interaction .....	370
<i>Liyuan Li, Kah Eng Hoe, Xinguo Yu, Li Dong, and Xinqi Chu</i>	
Fast FEM-Based Non-Rigid Registration .....	378
<i>Karteek Popuri, Dana Cobzas, and Martin Jägersand</i>	
<b>Author Index</b> .....	386