



**The 6th International Conference on
3-D Digital Imaging and Modeling**

3DIM 2007

21-23 August 2007
Montréal, Québec, Canada

Conference Guide



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WELCOME

Welcome to the 6th International Conference on 3-D Digital Imaging and Modeling (3DIM 2007). This year marks the 10th anniversary of the 3DIM conference series. Since its beginning in 1997, the conference's objective goal has been to provide a forum for researchers interested in optical acquisition, computational transformation and visualization of 3D information. As a focused, medium-size conference, 3DIM offers an excellent opportunity for presenting the most recent advances in this rapidly evolving field, and for direct interaction with other members of the 3D imaging and modeling research community.

Again this year, the conference proposes a high quality program, composed of oral and poster presentations, and five distinguished invited speakers. We are confident that the scientific program, the demo session and the social events will result in an exciting and fruitful three days of conference.

Welcome to Montréal. Welcome to 3DIM 2007.

Guy Godin
Conference Chair

Patrick Hébert
Takeshi Masuda
Gabriel Taubin
Program Co-Chairs

General Information

BADGES

Badges must be worn at all times in order to gain access to the oral, poster and demo sessions and to all social activities.

SPEAKERS

All speakers are to report to their session chair and the technical assistant in the Saisons Room 20 minutes before the beginning of the session in which their talk is scheduled in order to introduce themselves and test their presentations.

Presenters can use their own computer or bring their presentation (in PPT or PDF formats) on a USB memory stick or CD-ROM. A computer (equipped with DVD/CD reader and USB port) will be available onsite, supporting PowerPoint or PDF format presentations. Computers will be connected to a video switch prior to the session's beginning, and left on the front table for the duration of the session in order to ensure a smooth flow of presentations.

SOCIAL PROGRAM

Opening Reception

Monday, August 20

19:00 – 21:00

Printemps Room

All registered delegates are invited to the Conference official Welcome Reception. Please come to meet your colleagues in a friendly social atmosphere.

Banquet

Wednesday, August 22

18:30 – 22:00

Pierre de Coubertin Room

One Banquet ticket is included in your registration fee. Additional tickets can be purchased at the registration desk on Monday evening or Tuesday morning at a cost of \$70 CDN each.

Informal Social Event

Thursday, August 23

18:00 – 21:00

Les Terrasses Bonsecours, Lounge Terrasse

Join your colleagues on a terrace in Old Montreal that offers an incredible panorama of the city. Cover charge is complimentary. Drinks and appetizers are reasonably priced.

POSTER SESSION

Wednesday, August 22

Printemps Room

13:45 to 15:45

(short oral presentations at 11:00, in Saisons Room)

Poster boards will be available and posters should be mounted as of 13:15 the day of the Poster Session. Presenters should be present at their posters during the entire Poster Session.

The oral presentations of posters are allocated 3 minutes; it is highly recommended that the presentations be pre-loaded on the conference computer. They should be provided to the technical assistants during the afternoon break on Tuesday, August 21. Presenters that absolutely require the use of their own computers must inform the assistants during the same break period.

SESSION CHAIRS

Session Chairs should be present in the Saisons Room at least 20 minutes prior to the start of the session in order to meet the speakers.

BUS AND METRO NETWORK

Montreal has an extensive network of bus and metro services. For further information on public transportation in Montréal, please visit the site <http://www.stcum.qc.ca>.

TAXES

The Goods and Services Tax (GST) is a 6% federal tax that is charged on most goods and services sold or provided in Canada. The Québec provincial sales tax (QST) is currently 7.5%.

TIPPING AND GRATUITY

A rate of 10% to 15% is recommended in Canada for tipping for service in restaurants, taxis, hair salons etc. It is customary to calculate the tip on the subtotal prior to applicable taxes.

MEALS

There are two restaurants located within the Hotel Omni Mont-Royal: *Zen Chinese Cuisine* (open daily for lunch and dinner) and *Le Petit Opus Café Bar* (open daily for breakfast and light lunch). Morning and afternoon coffee breaks will be provided daily.

The Banquet is held on Wednesday evening, Aug. 22.

You will also find, in the vicinity of the hotel, a wide variety of restaurants that will cater to a wide range of taste and budget.

For affordable and fast menu options, we particularly recommend the food courts located either in *Les Cours Mont-Royal* (located at the corner of Peel and Maisonneuve, metro level) or at *Le Centre Eaton* (705 St-Catherine West, between University and McGill College, level 1).

The Hotel Omni Montreal personnel can provide you with additional suggestions. You can find information on the following websites:

- www.montrealplus.ca
- www.ziplocal.com
- www.conciergerie.com
- www.zagat.com

MESSAGE BOARD

For your convenience, a message board will be located near the registration desk.

INTERNET

There is free Wi-Fi wireless internet access in all public areas of the Hotel Omni Mont-Royal (with the exception of the meeting rooms and restaurants).



The 6th International Conference on
3-D Digital Imaging and Modeling

Conference Program

Monday, August 20 – Printemps Room

19:00 – 21:00 Welcoming Reception

Tuesday, August 21 – Saisons Room

08:20 Opening Remarks

08:35 – 09:15 **Invited Speaker: Demetri Terzopoulos**
A Tensor Algebraic Approach to Image Synthesis, Analysis and Recognition
M.A.O. Vasilescu, D. Terzopoulos
(p. 3 – page number in the Proceedings)

09:15 Short Announcement

09:20 – 10:35 **Oral Session 1: Geometry** **Chair: Gabriel Taubin**

Surface Reconstruction from Point Clouds by Transforming the Medial Scaffold
M.-C. Chang, F.F. Leymarie, B.B. Kimia (p. 13)

Automated Reverse Engineering of Free Form Objects Using Morse Theory
J.W. Branch, F. Prieto, P. Boulanger (p. 21)

A Comparative Analysis of Depth-Discontinuity and Mixed-Pixel Detection Algorithms
P. Tang, D. Huber, B. Akinci (p. 29)

10:35 – 11:00 Break

11:00 – 12:15 **Oral Session 2: Appearance Modeling and Visualization** **Chair: Demetri Terzopoulos**

Data-Driven Feature-Based 3D Face Synthesis
Y. Zhang, S. Xu (p. 39)

A Sampling Criterion for Optimizing a Surface Light Field
P. Lambert, J.-D. Deschênes, P. Hébert (p. 47)

Super-Resolution Stereo- and Multi-view Synthesis from Monocular Video Sequences
S. Knorr, M. Kunter, T. Sikora (p. 55)

12:15 Short Announcement

12:20 – 13:45 Lunch

13:45 – 15:00 **Oral Session 3: Registration and Recognition 1** **Chair: Luc Van Gool**

Deformable Registration of Textured Range Images by Using Texture and Shape Features
R. Sagawa, N. Osawa, Y. Yagi (p. 65)

Tuesday, August 21 – Saisons Room

Predetermination of ICP Registration Errors and Its Application to View Planning
K.-L. Low, A. Lastra (p. 73)

Automatic Pose Estimation for Range Images
on the GPU
M. Germann, M.D. Breitenstein, I.K. Park, H. Pfister
(p. 81)

15:00 – 15:25 Break

15:25 – 16:40 **Oral Session 4: Sensors and Sensing 1** **Chair: François Blais**

3D Laser Measurement System for Large Scale Architectures Using Multiple Mobile Robots
R. Kurazume, Y. Tobata, Y. Iwashita, T. Hasegawa
(p. 91)

Interactive Scanning of Haptic Textures and
Surface Compliance
S. Andrews, J. Lang (p. 99)

Surround Structured Lighting for
Full Object Scanning
D. Lanman, D. Crispell, G. Taubin (p. 107)

16:40 Short Announcement

16:45 – 17:25 **Invited Speaker: Sébastien Roy** Scaling Up Multiprojector Immersive Displays: The LightTwist Project (p. 117)

17:25 Short Announcement

17:30 End of Sessions

19:00 – 21:00 Open Demo Night
Printemps Room

Wednesday, August 22 – Saisons Room

08:30 Short Announcement

08:35 – 09:15 **Invited Speaker: Luc Van Gool** 3D Challenges and a Non-In-Depth Overview of Recent Progress *L. Van Gool, B. Leibe, P. Müller,* *M. Vergauwen, T. Weise* (p. 118)

09:15 Short Announcement

09:20 – 10:35 **Oral Session 5: Sensors and Sensing 2** **Chair: Ryusuke Sagawa**

Light Stripe Triangulation for Multiple of
Moving Rigid Objects
T. Funatomi, M. Iiyama, K. Kakusho, M. Minoh
(p. 133)

Dense Depth and Color Acquisition of
Repetitive Motions
Y. Xu, D.G. Aliaga (p. 141)

Dense 3D Reconstruction Method Using Coplanarities and Metric Constraints for
Line Laser Scanning
H. Kawasaki, R. Furukawa (p. 149)

- 10:35 – 11:00 Break
11:00 – 12:15 Fast Forward Poster Preview
12:15 Short Announcement
12:20 – 13:45 Lunch
13:45 – 15:45 Poster Session and Break
Printemps Room

Poster Session - Printemps Room

- P1 Dual-Mode Deformable Models for Free-Viewpoint Video of Sports Events
J. Kilner, J. Starck, A. Hilton, O. Grau (p. 177)
- P2 Range Image Segmentation for Modeling and Object Detection in Urban Scenes
C.C. Chao, I. Stamos (p. 185)
- P3 Self-Organizing Deformable Model for Mapping 3D Object Model onto Arbitrary Target Surface
K. Morooka, S. Matsui, H. Nagahashi (p. 193)
- P4 Joint Reconstruction and Registration of a Deformable Planar Surface Observed by a 3D Sensor
U. Castellani, V. Gay-Bellile, A. Bartoli (p. 201)
- P5 Discrete Delaunay: Boundary Extraction from Voxel Objects
D. Boltcheva, D. Bechmann, S. Thery (p. 209)
- P6 Fast Omnidirectional 3D Scene Acquisition with an Array of Stereo Cameras
J. Zhu, G. Humphreys, D. Koller, S. Steuart, R. Wang (p. 217)
- P7 Silhouette Extraction with Random Pattern Backgrounds for the Volume Intersection Method
M. Toyoura, M. Iiyama, K. Kakusho, M. Minoh (p. 225)
- P8 Orientation of Image Sequences in a Point-Based Environment Model
J. Böhm (p. 233)
- P9 Three-Dimensional Reconstruction Using the Perpendicularity Constraint
B. Boufama, A. Habed (p. 241)
- P10 Construction of Feature Landmark Database Using Omnidirectional Videos and GPS Positions
S. Ikeda, T. Sato, K. Yamaguchi, N. Yokoya (p. 249)
- P11 Tracking of Human Body Parts Using the Multiocular Contracting Curve Density Algorithm
M. Hahn, L. Krüger, C. Wöhler, H.-M. Gross (p. 257)
- P12 Automatic Registration for Model Building Using Variable Dimensional Local Shape Descriptors
B. Taati, M. Bondy, P. Jasiobedzki, M. Greenspan (p. 265)

- P13 Robust 2D-3D Alignment Based on Geometrical Consistency
K. Hara, Y. Kabashima, Y. Iwashita, R. Kurazume, T. Hasegawa (p. 273)
- P14 Online Registration of Multi-view Range Images Using Geometric and Photometric Feature Tracking
S.-Y. Park, J. Baek (p. 281)
- P15 Shape-Merging and Interpolation Using Class Estimation for Unseen Voxels with a GPU-Based Efficient Implementation
R. Furukawa, T. Itano, A. Morisaka, H. Kawasaki (p. 289)
- P16 Pose Determination by Potential Well Space Embedding
L. Shang, M. Greenspan (p. 297)
- P17 Image-Based Model Completion
A. Brunton, S. Wuhler, C. Shu (p. 305)
- P18 Surface Modelling of Plants from Stereo Images
Y. Song, R. Wilson, R. Edmondson, N. Parsons (p. 312)
- P19 Modeling and Calibration of Coupled Fish-Eye CCD Camera and Laser Range Scanner for Outdoor Environment Reconstruction
X. Brun, F. Goulette (p. 320)
- P20 Stratified Self-Calibration and Metric Reconstruction of a Trinocular Structured Light Vision System
Y. Li, S.K. Lee (p. 328)

Wednesday, August 22 – Saisons Room

15:45 – 16:35 **Oral Session 6: Modeling from Images** **Chair: Kyros Kutulakos**

Estimating the Location of a Camera with Respect to a 3D Model
G. Yang, J. Becker, C.V. Stewart (p. 159)

A Bayesian Framework for Simultaneous Matting and 3D Reconstruction
J.-Y. Guillemaut, A. Hilton, J. Starck, J. Kilner, O. Grau (p. 167)

16:35 – 17:15 **Invited Speaker: Hans-Peter Seidel** Modeling Visual Perception for High Dynamic Range Imaging

- 17:15 Short Announcement
- 17:20 End of Sessions
- 18:30 Banquet – Pierre de Coubertin Room

Thursday, August 23 – Saisons Room

08:30 Short Announcement

8:35 – 09:15 **Invited Speaker: Kyros N. Kutulakos**
Light Transport Analysis for 3D Photography (p. 337)

09:15 Short Announcement

09:20 – 10:35 **Oral Session 7: Shape-from-X**
Chair: Chang Shu

Multi-view Edge-Based Stereo by Incorporating Spatial Coherence
G. Li, Y. Genc, S.W. Zucker (p. 341)

Exemplar-Based Shape from Shading
X. Huang, J. Gao, L. Wang, R. Yang (p. 349)

Two-Frame Frequency-Based Estimation of Local Motion Parallax Direction in 3D Cluttered Scenes
V. Couture, M.S. Langer, A. Caine, R. Mann (p. 357)

10:35 – 11:00 Break

11:00 – 12:15 **Oral Session 8: Sensors and Sensing 3**
Chair: Hiroshi Kawasaki

A Cable-Driven Parallel Mechanism for Capturing Object Appearance from Multiple Viewpoints
*J.-D. Deschênes, P. Lambert, S. Perreault,
N. Martel-Brisson, N. Zoso, A. Zaccarin, P. Hébert,
S. Bouchard, C.M. Gosselin* (p. 367)

A Sensor for Simultaneously Capturing Texture and Shape by Projecting Structured Infrared Light
K. Akasaka, R. Sagawa, Y. Yagi (p. 375)

Real-Time Full-Field 3-D Surface-Shape Measurement Using Off-the-Shelf Components and a Single Processor
P. Jia, J. Kofman, C. English (p. 382)

12:15 Short Announcement

12:20 – 13:45 Lunch

13:45 – 15:00 **Oral Session 9: Shape Modeling**
Chair: Daniel Aliaga

Hybrid Scene Reconstruction by Integrating Scan Data and Stereo Image Pairs
X. Ma, H. Zha (p. 393)

Generalized MPU Implicits Using Belief Propagation
Y.-L. Chen, S.-H. Lai, T.-Y. Lee (p. 400)

A Study of Shape Similarity for Temporal Surface Sequences of People
P. Huang, J. Starck, A. Hilton (p. 408)

15:00 – 15:25 Break

15:25 – 16:40 **Oral Session 10: Registration and Recognition 2**
Chair: Kazunori Umeda

Thursday, August 23 – Saisons Room

Cached k -d Tree Search for ICP Algorithms

A. Nüchter, K. Lingemann, J. Hertzberg (p. 419)

Outlier Robust ICP for Minimizing Fractional RMSD

J.M. Phillips, R. Liu, C. Tomasi (p. 427)

Aerial Lidar Data Classification Using AdaBoost

S.K. Lodha, D.M. Fitzpatrick, D.P. Helmbold (p. 435)

16:40 Closing Remarks

16:55 End of Conference

18:00 Informal Social Event
Les Terrasses Bonsecours
Quai de l'horloge, île Bonsecours

PROGRAM AT A GLANCE

Tuesday, August 21, 2007	Wednesday, August 22, 2007	Thursday, August 23, 2007
08:20 - Opening Remarks		
08:35 - Invited Speaker: Demetri Terzopoulos A Tensor Algebraic Approach to Image Synthesis, Analysis and Recognition	08:35 - Invited Speaker: Luc Van Gool 3D Challenges and a Non-In-Depth Overview of Recent Progress	08:35 - Invited Speaker: Kyros N. Kutulakos Light Transport Analysis for 3D Photography
09:20 - Oral Session 1: Geometry	09:20 - Oral Session 5: Sensors and Sensing 2	09:20 - Oral Session 7: Shape-from-X
10:35 - Break		
11:00 - Oral Session 2: Appearance Modeling and Visualization	11:00 - Fast Forward Poster Preview	11:00 - Oral Session 8: Sensors and Sensing 3
12:20 – Lunch		
13:45 - Oral Session 3: Registration and Recognition 1	13:45 - Poster Session and Break Printemps Room	13:45 - Oral Session 9: Shape Modeling
15:00 – Break		15:00 - Break
15:25 - Oral Session 4: Sensors and Sensing 1	15:45 - Oral Session 6: Modeling from Images	15:25 - Oral Session 10: Registration and Recognition 2
16:45 - Invited Speaker: Sébastien Roy Scaling Up Multiprojector Immersive Displays: The LightTwist Project	16:35 - Invited Speaker: Hans-Peter Seidel Modeling Visual Perception for High Dynamic Range Imaging	16:40 - Closing Remarks
17:30 - End of Session	17:20 - End of Session	16:55 - End of Conference
19:00 - Open Demo Night Printemps Room	18:30 - Banquet Pierre de Coubertin Room	18:00 - Informal Social Event Les Terrasses Bonsecours