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PROCEEDINGS

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Electronic Imaging

SCIENCE AND TECHNOLOGY

26 January 2020 — 30 January 2020 • Burlingame, CA, USA

3D Measurement and Data Processing 2020

Editors: **William Puech,** Laboratory d'Informatique de Robotique et de Microelectronique de Montpellier (France);
Robert Sitnik, Warsaw University of Technology (Poland)

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held 26 January — 30 January 2020, at the Hyatt Regency San Francisco Airport in Burlingame, CA.

Society for Imaging Science and Technology
7003 Kilworth Lane • Springfield, VA 22151 USA
703/642-9090; 703/642-9094 fax
info@imaging.org; www.imaging.org

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3D Measurement and Data Processing 2020

Conference overview

Scientific and technological advances during the last decade in the fields of image acquisition, processing, telecommunications, and computer graphics have contributed to the emergence of new multimedia, especially 3D digital data. Nowadays, the acquisition, processing, transmission, and visualization of 3D objects are a part of possible and realistic functionalities over the internet. Confirmed 3D processing techniques exist and a large scientific community works hard on open problems and new challenges, including 3D data processing, transmission, fast access to huge 3D databases, or content security management.

The emergence of 3D media is directly related to the emergence of 3D acquisition technologies. Indeed, recent advances in 3D scanner acquisition and 3D graphics rendering technologies boost the creation of 3D model archives for several application domains. These include archaeology, cultural heritage, computer assisted design (CAD), medicine, face recognition, video games, and bioinformatics. New devices such as time-of-flight cameras open challenging new perspectives on 3D scene analysis and reconstruction.

Three-dimensional objects are more complex to handle than other multimedia data, such as audio signals, images, or videos. Indeed, only a unique and simple 2D grid representation is associated to a 2D image. All the 2D acquisition devices generate this same representation (digital cameras, scanners, 2D medical systems). Unfortunately (for the users), but fortunately (for scientists), there exist different 3D representations for a 3D object. For example, an object can be represented on a 3D grid (digital image) or in 3D Euclidian space. In the latter, the object can be expressed by a single equation (like algebraic implicit surfaces), by a set of facets representing its boundary surface, or by a set of mathematical surfaces. One can easily imagine the numerous open problems related to these different representations and their processing, a new challenge for the image processing community.

Paper authors listed as of 1 January 2020;
refer to manuscript for final authors.
Titles that are not listed with the proceedings
files were presentation-only.

3D MEASUREMENT AND DATA PROCESSING 2020

Monday, January 27, 2020

3D/4D NN-based Data Processing

Session Chair: Tyler Bell, University of Iowa (United States)

8:45 – 10:10 am
Grand Peninsula A

8:45
Conference Welcome

8:50 3DMP-002
Deadlift recognition and application based on multiple modalities using recurrent neural network, *Shih-Wei Sun[1], Ting-Chen Mou[2], and Pao-Chi Chang[2]; [1]Taipei National University of the Arts and [2]National Central University (Taiwan)*

9:10 3DMP-003
Learning a CNN on multiple sclerosis lesion segmentation with self-supervision, *Alexandre Fenneteau[1], Pascal Bourdon[1,2,3], David Helbert[1,2,3], and Christophe Habas[4]; [1]University of Poitiers, [2]I3M, Common Laboratory CNRS-Siemens, University and Hospital of Poitiers, [3]XLIM Laboratory, and [4]Quinze-Vingts Hospital (France)*

9:30 3DMP-004
Action recognition using pose estimation with an artificial 3D coordinates and CNN, *Jisu Kim and Deokwoo Lee, Keimyung University (Republic of Korea)*

9:50
3DMP Q&A Session Discussion

10:10 – 10:50 am Coffee Break

3D/4D Measurement and Processing

Session Chair: Tyler Bell, University of Iowa (United States)

10:50 am – 12:10 pm
Grand Peninsula A

10:50 3DMP-034
Variable precision depth encoding for 3D range geometry compression, *Matthew Finley and Tyler Bell, University of Iowa (United States)*

11:10 3DMP-035
3D shape estimation for smooth surfaces using structured light patterns, *Yin Wang and Jan Allebach, Purdue University (United States)*

11:30 3DMP-036
Quality assessment for 3D reconstruction of building interiors, *Umamaheswaran Raman Kumar, Inge Coudron, Steven Puttemans, and Patrick Vandewalle, Katholieke Universiteit Leuven (Belgium)*

11:50
3DMP Q&A Session Discussion

12:30 – 2:00 pm Lunch

PLENARY: Frontiers in Computational Imaging

Session Chairs: Radka Tezaur, Intel Corporation (United States) and Jonathan Phillips, Google Inc. (United States)

2:00 – 3:10 pm
Grand Peninsula Ballroom D
Imaging the Unseen: Taking the First Picture of a Black Hole,
Katie Bouman, assistant professor, Computing and Mathematical Sciences Department, California Institute of Technology (United States)

For abstract and speaker biography, see page 7

3:10 – 3:30 pm Coffee Break
5:00 – 6:00 pm All-Conference Welcome Reception

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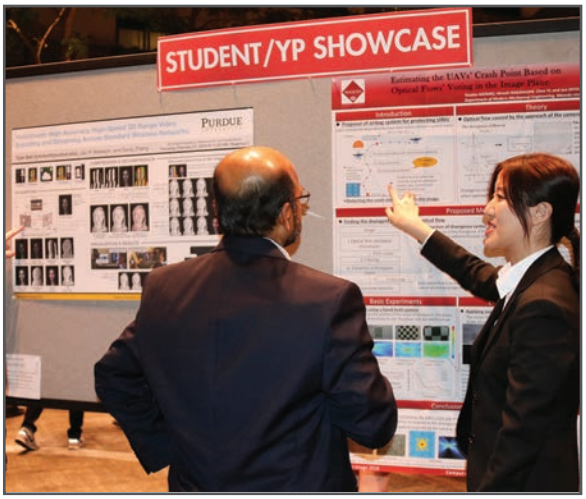

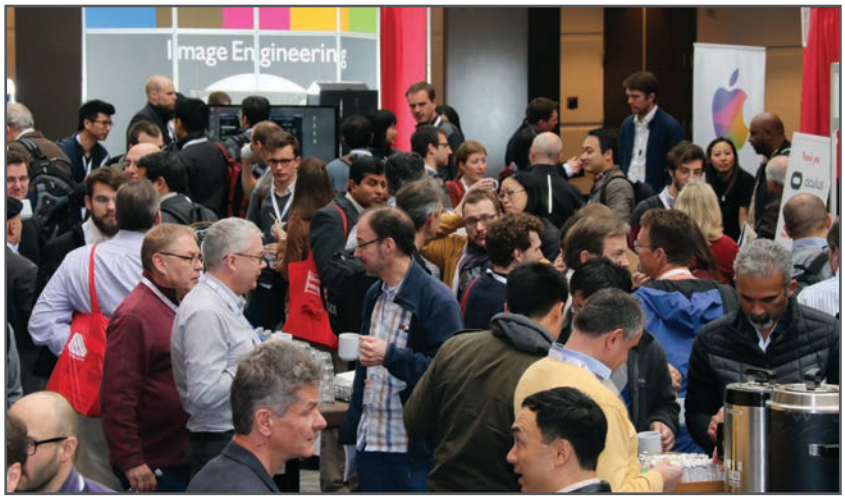

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• INTERACTIVE PAPER SESSION • SPECIAL EVENTS • TECHNICAL SESSIONS •

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