IS&T International Symposium on Electronic Imaging Science and Technology 2017

Intelligent Robotics and Industrial Applications using Computer Vision 2017

Burlingame, California, USA
29 January – 2 February 2017

Editors:

Henry Ngan
Kurt Niel
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Intelligent Robotics and Industrial Applications using Computer Vision 2017

Wednesday, February 1, 2017

Autonomous Robotics

Session Chair: Juha Röning, University of Oulu (Finland)

8:50 – 10:10 am
Cypress C

8:50   5
Efficient visual loop closure detection in different times of day, *Can Erhan[1], Evangelos Sariyanidi[2], Onur Sencan[1], and Hakan Temeltas[1]; [1]Istanbul Teknik Üniv. (Turkey) and [2]Queen Mary, University of London (United Kingdom)* (IRIACV-258)

9:10   10
Real-time mobile robot navigation based on stereo vision and low-cost GPS, *Soonhac Hong, Ming Li, Miao Liao, and Peter van Beek, Sharp Labs of America (United States)* (IRIACV-259)

9:30   16
The acceleration effect to the perception of velocity difference in passive elbow flexion movement, *Fumihiro Akatsuka and Yoshihiko Nomura, Mie University (Japan)* (IRIACV-260)

9:50   22
The challenge of preparing teams for the European Robotics League: Emergency, *J. Röning[1], M. Kauppinen[1], V. Pitkänen[1], A. Kemppainen[1], A. Tikanmäki[1], M. Furci[2], M. Palau Franco[3], A. Winfield[3], E. Stengler[3], B. Brueggemann[4], F. Schneider[4], A. Castro[5], M. Cordero Limon[6], A. Viguria[6], G. Ferri[7], F. Ferreira[7], Xingcun Liu[8], Y. Petillot[8], and D. Sosa[9]; [1]BISG (InfoTech Oulu) University of Oulu (Finland), [2]University of Bologna (Italy), [3]Bristol Robotics Lab and Science Communication Unit (United Kingdom), [4]Fraunhofer FKIE (Germany), [5]Oceanic Platform of the Canary Islands (Spain), [6]FADA Center for Advanced Aerospace Technologies (Spain), [7]NATO STO Centre for Maritime Research and Experimentation (Italy), [8]Herriot-Watt University (United Kingdom), and [9]University of Las Palmas de Gran Canaria (Spain)* (IRIACV-261)

10:00 am – 4:00 pm   Industry Exhibition

10:10 – 10:50 am   Coffee Break

Machine Vision and Imaging

Session Chair: Kurt Niel, University of Applied Sciences Upper Austria (Austria)

10:50 am – 12:10 pm
Cypress C

10:50
Application of big data analytics for recognition of microbial colonies from hyperspectral images, *Seung-Chul Yoon, Kurt Lawrence, Bosoon Park, and Gary Gamble, US Department of Agriculture-Agricultural Research Service (United States)* (IRIACV-262)

11:10   31
Weaving pattern recognition of ancient Chinese textiles by regular bands analysis, *Connie C.W. Chan, K. S. (Sammy) Li, and Henry Ngan, Hong Kong Baptist University (Hong Kong)* (IRIACV-263)

11:30   37
Finding a needle in a haystack: Recognizing surgical instruments through vision and manipulation, *Tian Zhou and Juan Wachs, Purdue University (United States)* (IRIACV-264)

11:50
Education in industrial machine vision in Upper Austria University of Applied Sciences (bachelor/master) with respect to the needs by the European industry and automation engineering, *Kurt Niel, University of Applied Sciences Upper Austria (Austria)* (IRIACV-266)

12:10 – 2:00 pm   Lunch Break

EI 2017 Wednesday Plenary and Symposium Awards
Session Chairs: Joyce E. Farrell, Stanford University, and Nitin Sampat, Rochester Institute of Technology (United States)
2:00 – 3:00 pm
Grand Peninsula Ballroom D

Designing VR video camera systems, *Brian Cabral, Facebook, Inc. (United States)*

Brian Cabral is Director of Engineering at Facebook, leading the Surround 360 VR camera team, specializing in computational photography, computer vision, and computer graphics. He has published a number of papers in the area of computer graphics and imaging including the pioneering Line Integral Convolution algorithm. Cabral discusses developing Facebook Surround 360, an open, high-quality 3D-360 video capture system. VR video capture systems are composed of multiple optical and digital components – all of which must operate as if they are one seamless optical system. The design of VR video cameras, optical choices, SNR, etc., require a new set of technologies and engineering approaches, with tight coupling to the computational system components.

3:00 – 3:30 pm   Coffee Break

Pattern Recognition and Inspection

Session Chair: Henry Ngan, Hong Kong Baptist University (Hong Kong)

3:30 – 5:10 pm
Cypress C

3:30   46
Unsupervised video segmentation and its application to region-based local contrast enhancement, *Sungbum Park[1], Woo-sung Shim[1], and Yong Seok Heo[2]; [1]Samsung Electronics and [2]Ajou University (Republic of Korea)* (IRIACV-267)

3:50   52
High-precision 3D sensing with hybrid light field & photometric stereo approach in multi-line scan framework, *Doris Antensteiner[1], Svorad Štolc[1], Kristián Valentín[1], Bernhard Blaschitz[1], Reinhold Huber-Mörk[1], and Thomas Pock[1,2]; [1]AIT Austrian Institute of Technology GmbH and [2]Graz University of Technology (Austria)* (IRIACV-268)

4:10   61
Line-scan stereo using binary descriptor matching and regularization, *Reinhold Huber-Mörk, Kristián Valentín, Bernhard Blaschitz, and Svorad Štolc, AIT Austrian Institute of Technology GmbH (Austria)* (IRIACV-269)

4:30   67
Traffic Camera Dangerous Driver Detection (TCD3™), *Vidur Prasad, University of Michigan (United States)* (IRIACV-270)

4:50   73
Outlier detection in large-scale traffic data by naïve Bayes method and Gaussian mixture model method, *Philip Lam[1], Lili Wang[2], Henry Ngan[1], Nelson H.C. Yung[3], and Anthony G. O. Yeh[3]; [1]Hong Kong Baptist University, [2]Hong Kong Polytechnic University, and [3]The University of Hong Kong (Hong Kong)* (IRIACV-272)

Symposium Interactive Papers (Poster) Session
5:30 – 7:30 pm
Atrium