Image Processing: Machine Vision Applications VII

Kurt S. Niel
Philip R. Bingham
Editors

3–4 February 2014
San Francisco, California, United States

Sponsored by
IS&T—The Society for Imaging Science and Technology
SPIE

Published by
SPIE

Volume 9024

Proceedings of SPIE 0277-786X, v. 9024
Contents

vii  Conference Committee
ix Introduction

SESSION 1  INDUSTRIAL MACHINE VISION APPLICATIONS

9024 02  Machine vision based quality inspection of flat glass products [9024-2]
G. Zauner, M. Schagerl, Univ. of Applied Sciences Upper Austria (Austria)

9024 03  Stain defect detection for mobile phone camera modules [9024-3]
S. Hong, C. Lee, Yonsei Univ. (Korea, Republic of)

9024 05  Trends and developments in industrial machine vision: 2013 [9024-5]
K. Niel, C. Heinzl, Univ. of Applied Sciences Upper Austria (Austria)

SESSION 2  COMPUTATIONAL VISION AND IMAGING TECHNIQUES I

9024 06  Symbolic feature detection for image understanding [9024-6]
S. Aslan, Ege Univ. (Turkey); C. B. Akgül, B. Sankur, Bogaziçi Univ. (Turkey)

9024 07  Depth and all-in-focus images obtained by multi-line-scan light-field approach
(Best Paper Award) [9024-7]
S. Štolc, AIT Austrian Institute of Technology GmbH (Austria) and Institute of Measurement
Science (Slovakia); R. Huber-Mörk, B. Holländer, D. Soukup, AIT Austrian Institute of
Technology GmbH (Austria)

9024 08  Eye-safe projection system with flexible architecture [9024-8]
V. Sabirov, Skolkovo Institute of Science and Technology (Russian Federation)

9024 09  Line detection in a noisy environment with weighted Radon transform [9024-9]
P. Babayan, N. Shubin, Ryazan State Radio Engineering Univ. (Russian Federation)

SESSION 3  COMPUTATIONAL VISION AND IMAGING TECHNIQUES II

9024 0A  Efficient adaptive thresholding with image masks [9024-10]
Y.-T. Oh, Y. Hwang, J.-B. Kim, W.-C. Bang, Samsung Advanced Institute of Technology
(Korea, Republic of)

9024 0C  Illumination invariant pattern recognition using fringe-adjusted joint transform correlator
and monogenic signal [9024-12]
P. Sidike, V. K. Asari, Univ. of Dayton (United States); M. S. Alam, Univ. of South Alabama
(United States)
Illumination invariant 3D change detection [9024-13]
Y. Diskin, V. Asari, P. Hytla, Univ. of Dayton (United States); J. Vasquez, Air Force Research Lab. (United States)

SESSION 4 THERMAL, COLOR, AND/OR SPECTROSCOPIC IMAGING ALGORITHMS AND APPLICATIONS

High throughput imaging and analysis for biological interpretation of agricultural plants and environmental interaction [9024-14]
H. Hong, J. Benac, D. Riggsbee, K. Koutsky, Monsanto Co. (United States)

Investigation of segmentation based pooling for image quantification [9024-15]
R. Porter, N. Harvey, C. Ruggiero, Los Alamos National Lab. (United States)

On the use of MKL for cooking action recognition [9024-16]
S. Bianco, G. Ciocca, P. Napoletano, Univ. degli Studi di Milano-Bicocca (Italy)

Hyperspectral image reconstruction using RGB color for foodborne pathogen detection on agar plates [9024-18]
S.-C. Yoon, T.-S. Shin, B. Park, K. C. Lawrence, G. W. Heitschmidt, Agricultural Research Service (United States)

Improved wheal detection from skin prick test images [9024-19]
O. Bulan, Xerox Corp. (United States)

SESSION 5 IMAGE-RELATED PATTERN RECOGNITION TECHNIQUES AND APPLICATIONS

Face recognition by detection of matching cliques of points [9024-20]
F. Stentiford, Univ. College London (United Kingdom)

Scoring recognizability of faces for security applications [9024-21]
S. Bianco, G. Ciocca, G. C. Guarnera, Univ. degli Studi di Milano-Bicocca (Italy); A. Scaggiante, Bettini S.r.l. (Italy); R. Schettini, Univ. degli Studi di Milano-Bicocca (Italy)

INTERACTIVE PAPER SESSION

An attentive multi-camera system [9024-1]
P. Napoletano, F. Tisato, Univ. degli Studi di Milano-Bicocca (Italy)

Object detection in MOUT: evaluation of a hybrid approach for confirmation and rejection of object detection hypotheses [9024-24]
D. Manger, J. Metzler, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Image thresholding using standard deviation [9024-26]
J.-M. Sung, D.-C. Kim, B.-Y. Choi, Y.-H. Ha, Kyungpook National Univ. (Korea, Republic of)
Quality control by HyperSpectral Imaging (HSI) in solid waste recycling: logics, algorithms and procedures [9024-28]
G. Bonifazi, S. Serranti, Univ. degli Studi di Roma La Sapienza (Italy)

Eye gaze tracking using correlation filters [9024-29]
M. Karakaya, Meliksah Univ. (Turkey); D. Bolme, C. Boehnen, Oak Ridge National Lab. (United States)

An uniformity algorithm for high-speed fixed-array printers [9024-31]
S. R. Vantaram, K. Chandu, M. Stanich, L. Ernst, Ricoh Production Print Solutions, LLC (United States)

Author Index
Conference Committee

Symposium Chair
Sergio R. Goma, Qualcomm Inc. (United States)

Symposium Cochair
Sheila S. Hemami, Northeastern University (United States)

Conference Chairs
Kurt S. Niel, Upper Austria University of Applied Sciences (Austria)
Philip R. Bingham, Oak Ridge National Laboratory (United States)

Conference Program Committee
Ewald Fauster, vatron GmbH (Austria)
Daniel Fecker, Technische Universität Braunschweig (Germany)
Steven P. Floeder, 3M Company (United States)
David Fofi, Université de Bourgogne (France)
Shaun Gleason, National Oceanography Center (United Kingdom)
Keith Jenkins, The University of Southern California (United States)
Olivier Laligant, Université de Bourgogne (France)
Edmund Y. Lam, The University of Hong Kong (Hong Kong, China)
Fabrice Meriaudeau, Université de Bourgogne (France)
Hamed Sari-Sarraf, Texas Tech University (United States)
Ivan W. Selesnick, Polytechnic Institute of New York University (United States)
Ralph Seulin, Université de Bourgogne (France)
Christophe Stolz, Université de Bourgogne (France)
Vincent C. Paquit, Oak Ridge National Laboratory (United States)
Gerald Zauner, FH OÖ Forschungs & Entwicklungs GmbH (Austria)

Session Chairs
1 Industrial Machine Vision Applications
Philip R. Bingham, Oak Ridge National Laboratory (United States)

2 Computational Vision and Imaging Techniques I
Gerald Zauner, FH OÖ Forschungs & Entwicklungs GmbH (Austria)

3 Computational Vision and Imaging Techniques II
Kurt S. Niel, Upper Austria University of Applied Sciences (Austria)
4 Thermal, Color, and/or Spectroscopic Imaging Algorithms and Applications
   Gerald Zauner, FH OÖ Forschungs & Entwicklungs GmbH (Austria)

5 Image-Related Pattern Recognition Techniques and Applications
   Kurt S. Niel, Upper Austria University of Applied Sciences (Austria)
Introduction

In our everyday machine vision work, we are facing two big and very complex challenges. On one hand, we are doing scientific research in exploring the fundamental behavior of imaging systems and methods. On the other hand, we cooperate strongly with industrial needs for reliable quality under constraints of a reasonable budget. There are clear gaps in the goals of these two challenges and even contradictions in their demands.

Our conference, Machine Vision Applications, serves as a forum to discuss efforts that span these demands by bringing scientific research and industrial needs together. On reading the contributions to this conference, one will get a feel for how the different branches of machine vision serve to support industrial needs. You will find papers describing quality control issues at manufacturing processes, agricultural evaluations, face detection for security purposes, 3D topographical modelling by airborne images, hyperspectral detection for biological surveys, and many others. There are also papers concerning a bit more abstract level of machine vision indicating improvements in algorithms—speed, reliability, and memory usage—by keeping the quality of the overall evaluation task.

In this context, our community offers the "Best Paper Award" for contributions that combine three essential aspects: scientific background, industrial reliability, and clarity in writing, presentation, and discussion. The paper, “Depth and all-in-focus images obtained by multi-line-scan light-field approach,” (9024-07), has been selected for this award. Congratulations!

Kurt S. Niel
Philip R. Bingham