

IS&T International Symposium on Electronic Imaging Science and Technology 2020

**Intelligent Robotics and Industrial
Applications using Computer Vision 2020**

**Burlingame, California, USA
26 – 30 January 2020**

Editors:

**Henry Ngan
Kurt Niel
Juha Roning**

ISBN: 978-1-7138-3822-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2020) by Society for Imaging Science & Technology
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact Society for Imaging Science & Technology
at the address below.

Society for Imaging Science & Technology
7003 Kilworth Lane
Springfield, Virginia 22151
USA

Phone: 703-642-9090
Fax: 703-642-9094

info@imaging.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PASSIVE INFRARED MARKERS FOR INDOOR ROBOTIC POSITIONING AND NAVIGATION	1
<i>Chen, Jian</i>	
IMPROVING MULTIMODAL LOCALIZATION THROUGH SELF-SUPERVISION	6
<i>Relyea, Robert; Bhanushali, Darshan; Manghi, Karan; Vashist, Abhishek; Hochgraf, Clark; Ganguly, Amlan; Kwasinski, Andres; Kuhl, Michael E.; Ptucha, Raymond</i>	
CREATION OF A FUSION IMAGE OBTAINED IN DIFFERENT ELECTROMAGNETIC RANGES USED IN INDUSTRIAL ROBOTIC SYSTEMS	13
<i>Semenishchev, Evgenii; Viacheslav, Voronin; Aleksandr, Zelensky; Tolstova, Irina</i>	
LOCATING MECHANICAL SWITCHES USING RGB-D SENSOR MOUNTED ON A DISASTER RESPONSE ROBOT	19
<i>Kanda, Takuya; Miyakawa, Kazuya; Hayashi, Jeonghwang; Ohya, Jun; Ogata, Hiroyuki; Hashimoto, Kenji; Sun, Xiao; Matsuzawa, Takashi; Naito, Hiroshi; Takanishi, Atsuo</i>	
A REVIEW AND QUANTITATIVE EVALUATION OF SMALL FACE DETECTORS IN DEEP LEARNING	25
<i>Wu, Hua; Yang, Shuang; Xiong, Weihua; Sun, Shanhu Yu, Xinsheng; Wei, Tongqi</i>	
RARE-CLASS EXTRACTION USING CASCADED PRETRAINED NETWORKS APPLIED TO CRANE CLASSIFICATION	32
<i>Klomp, Sander R.; Brouwers, Guido M. Y. E.; Wijnhoven, Rob G. J.; With, Peter H. N. De</i>	
DETECTION AND CHARACTERIZATION OF RUMBLE STRIPS IN ROADWAY VIDEO LOGS	38
<i>Aykac, Deniz; Karnowski, Thomas; Ferrell, Regina; Goddard, James S.</i>	
PERCEPTUAL LICENSE PLATE SUPER-RESOLUTION WITH CTC LOSS	45
<i>Bilková, Zuzana; Hradiš, Michal</i>	
ESTIMATING VEHICLE FUEL ECONOMY FROM OVERHEAD CAMERA IMAGERY AND APPLICATION FOR TRAFFIC CONTROL	49
<i>Karnowski, Thomas; Tokola, Ryan; Oesch, Sean; Eicholtz, Matthew; Price, Jeff; Gee, Tim</i>	
TAILORED PHOTOMETRIC STEREO: OPTIMIZATION OF LIGHT SOURCE POSITIONS FOR VARIOUS MATERIALS	55
<i>Kapeller, Christian; Antensteiner, Doris; Štolc, Svorad</i>	
CROWD CONGESTION DETECTION IN VIDEOS	61
<i>Khan, Sultan Daud; Mahmud, Maqsood; Ullah, Habib; Ullah, Mohib; Cheikh, Faouzi Alaya</i>	
HEAD BASED TRACKING	67
<i>Ullah, Mohib; Mahmud, Maqsood; Ullah, Habib; Ahmad, Kashif; Imran, Ali Shariq; Cheikh, Faouzi Alaya</i>	
AN EVALUATION OF EMBEDDED GPU SYSTEMS FOR VISUAL SLAM ALGORITHMS	72
<i>Peng, Tao; Zhang, Dingnan; Hettiarachchi, Don Lahiru Nirmal; Loomis, John</i>	
REAL-TIME SMALL-OBJECT CHANGE DETECTION FROM GROUND VEHICLES USING A SIAMESE CONVOLUTIONAL NEURAL NETWORK	77
<i>Klomp, Sander R.; Van De Wouw, Dennis W. J. M.; With, Peter H. N. De</i>	

Author Index