PROCEEDINGS OF SPIE

International Conference on Computer Vision, Robotics, and Automation Engineering (CRAE 2024)

Qiang Cheng Lei Chen Editors

21–23 June 2024 Kunming, China

Organized by Shandong University (China)

Sponsored by AEIC—Academic Exchange Information Centre (China)

Published by SPIE

Volume 13249

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in *International Conference on Computer Vision, Robotics, and Automation Engineering (CRAE 2024)*, edited by Qiang Cheng, Lei Chen, Proc. of SPIE 13249, Sevendigit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510682283

ISBN: 9781510682290 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.orc

Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

vii Conference Committee

COMPUTER VISION AND IMAGE PROCESSING TECHNOLOGY

13249 02	Deep food insight: a transfer learning approach for food detection and nutrient estimation through image analysis $[13249-46]$
13249 03	Depression level assessment based on 3D CNN and facial expression videos [13249-47]
13249 04	Optimization of super-resolution satellite image reconstruction [13249-33]
13249 05	Privacy preserving data distillation in medical imaging with multidimensional matching on PATHMNIST [13249-22]
13249 06	Multihop neighbor aggregator and contrast learning for few-shot knowledge graph complete [13249-42]
13249 07	Zero-shot contrastive vision-language pre-training for traffic sign recognition in adverse weather conditions [13249-23]
13249 08	Determination method of aircraft transition support resource allocation based on mission [13249-40]
13249 09	Advanced machine vision techniques for real-time quality detection and grading of navel oranges using high-resolution imaging and deep learning algorithms [13249-6]
13249 0A	Deep learning-based license plate information recognition in harsh environments [13249-24]
13249 OB	Research on quality prediction of resistance spot welding based on knowledge graph [13249-18]
13249 OC	Deep learning-based recognition of autism using facial datasets [13249-25]
13249 OD	HRPD: a lightweight high-resolution projector deblurring network [13249-30]
13249 OE	3D visualization of large scale point clouds on transmission lines [13249-34]
13249 OF	Model reconstruction and digital exhibition based on photogrammetry: a case study of bronze cultural relics in Hubei provincial museum $[13249-20]$
13249 0G	Enhancing small object detection in UAV images with DSD-YOLO [13249-3]
13249 OH	Machine vision-based sorting method for precision industrial components [13249-12]
	ROBOT STRUCTURE DESIGN AND MOTION PLANNING
13249 01	The optimal control of automated sorting robot movements based on PLC logic controller [13249-43]

13249 OJ	Unmanned vehicle path planning for orchards based on improved bidirectional A^* algorithm [13249-19]
13249 OK	Application and research of vision inspection in the position self-compensation system of industrial robot [13249-41]
13249 OL	A portable biomimetic robot path automation control method based on single neuron PID $[13249-9]$
13249 OM	Research on target detection algorithm in autonomous driving scenarios based on improved YOLOv5 [13249-16]
13249 ON	Path planning for AGVs based on a hybrid particle swarm optimization and ant colony optimization algorithm [13249-17]
13249 00	Optimization design of pneumatic soft finger structure based on response surface method and MOGA algorithm [13249-13]
13249 OP	Intelligent control and dynamics analysis of copper anode plate picking robot [13249-8]
13249 0Q	An improved osprey optimization algorithm fusing Latin hypercube and Lévy flight [13249-36]
13249 OR	Multiscale tracking for maneuver target using single sensor [13249-37]
13249 OS	Machine vision-based on-line high-speed inspection method for receiving hub filter rod core line of filter rod forming machine $[13249-10]$
13249 OT	Simulation and analysis of path planning algorithm for campus patrol robot based on ant colony algorithm $[13249\hbox{-}7]$
13249 OU	My fitness coach is AI: unraveling the influential mechanisms of AI coach-user-human coach interactions on users' behavioral intention $[13249-44]$
	INTELLIGENT CONTROL AND AUTOMATION SYSTEM APPLICATION
13249 OV	Wind direction adaptive assisted landing device and method for unattended UAV system [13249-14]
13249 OW	A multiobjective reinforcement learning approach for AGV task clustering [13249-11]
13249 OX	Research on transmission line identification technology under YOLOv5 framework [13249-27]
13249 OY	Unsupervised monocular depth estimation based on local planar guidance layer [13249-28]
13249 OZ	A fruit and vegetable recognition system based on EasyDL artificial intelligence development platform [13249-15]
13249 10	Adv-Makeup++: an adversarial makeup generation method for simultaneous optimization of disturbance distribution and improvement of attack success rate [13249-29]
13249 11	Research on gap elimination strategy of double motors for copper anode plate casting disc [13249-26]

13249 12	Research on synchronous control method of dual servo electric cylinder based on PLC [13249-35]
13249 13	A livestock recognition and detection algorithm based on improved YOLOv5s [13249-39]
13249 14	Detection of inter row navigation lines in corn fields based on improved CenterNet [13249-2]
13249 15	Stability control for longitudinal vehicular platoon [13249-4]
13249 16	Analysis and research on electric vehicle energy storage system based on ADVISOR [13249-5]
13249 17	A target detection algorithm of illegal satellite TV receiver based on the improved YOLO v9 $[13249-31]$
13249 18	Geometric imperfection detection method of chord pipe in transmission tower and application based on machine vision [13249-45]