

2021 IEEE 11th International Conference on Consumer Electronics (ICCE-Berlin 2021)

**Berlin, Germany
15 – 18 November 2021**



**IEEE Catalog Number: CFP21BIC-POD
ISBN: 978-1-6654-2834-7**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21BIC-POD
ISBN (Print-On-Demand):	978-1-6654-2834-7
ISBN (Online):	978-1-6654-2831-6
ISSN:	2166-6814

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
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

CODES OVER EISENSTEIN INTEGERS FOR THE NIEDERREITER CRYPTOSYSTEM	1
<i>Johann-Philipp Thiers, Jürgen Freudenberger</i>	
MICROCONTROLLER ARCHITECTURES FOR BATTERY STATE OF CHARGE PREDICTION WITH TINY NEURAL NETWORKS	7
<i>Danilo Pau, Davide Denaro, Giambattista Gruosso, Achraf Sahnoun</i>	
OBSERVING THE PATIENT EXPERIENCE: INSIDE THE DOCTOR'S OFFICE IN A PANDEMIC	13
<i>Mark Campbell, Sam Redfern, John William McEvoy, Fiona Concannon</i>	
ONLINE LEARNING ON TINY MICRO-CONTROLLERS FOR ANOMALY DETECTION IN WATER DISTRIBUTION SYSTEMS	19
<i>Danilo Pau, Abderrahim Khiari, Davide Denaro</i>	
SOCIAL DISTANCING CROWD SEGMENTATION, ESTIMATION AND VISUALISATION	25
<i>Justin Duncan, Frankie Inguanez</i>	
A GRAD-CAM AND YOLO BASED APPROACH TO EXTRACTING A HUMAN PASSAGEWAY ROI.....	31
<i>Owen Xuereb, Frankie Inguanez</i>	
USE OF BLOCKCHAIN TECHNOLOGY IN AUTOMATION OF AD-HOC LEASING AGREEMENTS	37
<i>Sigmond Gatt, Frankie Inguanez</i>	
OVERVIEW OF THE SWCS COMMUNICATION MECHANISMS IN AUTONOMOUS VEHICLES.....	43
<i>Dušan Kenjic, Marija Antic</i>	
DANCE STYLE CLASSIFICATION BY LSTM RNN	46
<i>Yanika Mifsud, Frankie Inguanez</i>	
STUDY OF COMMUNICATION RELIABILITY IMPROVEMENT USING MULTI-CHANNEL COMMUNICATION FOR LORA.....	52
<i>Ryotaro Sakauchi, Hikaru Yabe, Shuto Ishikawa, Yota Nomoto, Shunsuke Segawa, Mikiko Sode Tanaka</i>	
COMPLEMENTARY METHODS OF IOT RELIABILITY FOR EMBEDDING IOT DEVICES INTO SDP	56
<i>Yangchen Palmo, Shigeaki Tanimoto, Hiroyuki Sato, Atsushi Kanai</i>	
CHAMELEON: CONTACTLESS OPERATION APPLICATION ON CAMPUS	62
<i>Jon Wye Tan, Haruka Hata, Takashi Muronosono, Kazuki Fukae, Toru Kobayashi</i>	
A RETHINKING OF REAL-TIME COMPUTER VISION-BASED LANE DETECTION.....	65
<i>Denis Vajak, Mario Vranješ, Ratko Grbic, Nikola Teslic</i>	
A CLOUD-BASED EDTECH FRAMEWORK FOR AUGMENTING 3D OBJECTS TO ASSIST VOCATIONAL LEARNING.....	71
<i>Zvetlana Bajada, Daren Scerri</i>	

VISION-BASED HEALTH PROTOCOL OBSERVANCE SYSTEM FOR SMALL ROOMS.....	77
<i>Silvan Vella, Daren Scerri</i>	
HIGHLY REALISTIC GROUP WORK ENVIRONMENT IN HYFLEX CLASSES	83
<i>Kazuki Fukae, Toru Kobayashi</i>	
MULTI-CAMERA OBJECT LOCALIZATION AS A LAYER OF A HIGH-DEFINITION MAP.....	85
<i>Srdjan Usorac, Dejan Bordoški, Zeljko Lukac, Dragan Samardzija</i>	
GENERALIZED CONCATENATED CODES OVER GAUSSIAN INTEGERS FOR THE MCELIECE CRYPTOSYSTEM.....	89
<i>Johann-Philipp Thiers, Jürgen Freudenberger</i>	
SMART LIGHTING SOLUTION USING LIFI TECHNOLOGY IN INTELLIGENT BUILDINGS	95
<i>Younis H. Karim Aljewari, Timothy David Sinclair, Asma Saleh Ali Naqi Alahmed, Shayma Mohammed Fadil Alali</i>	
PERSONAL AND INTUITIVE INDOOR NAVIGATION SYSTEM BASED ON DIGITAL TWIN	100
<i>Toru Kobayashi, Yoshifumi Onimaru, Kazuki Fukae, Tetsuo Imai, Kenichi Arai, Eisuke Nakazawa, Tomohito Suzuki</i>	
APPLICATION OF A MASK R-CNN-BASED DEEP LEARNING MODEL COMBINED WITH THE RETINEX IMAGE ENHANCEMENT ALGORITHM FOR DETECTING ROCKFALL AND POTHOLES ON HILL ROADS.....	106
<i>Yao-Liang Chung, Jin-Jia Yang</i>	
ASSESSING THE USER EXPERIENCE OF CONSUMER HAPTIC DEVICES FOR SIMULATION-BASED VIRTUAL REALITY	112
<i>F. Gabriele Praticò, Davide Calandra, Matteo Piviotti, Fabrizio Lamberti</i>	
LEARNING FROM DRONE OBSERVATIONS ON HIGHWAYS: CHARACTERISTICS OF VEHICULAR TRAFFIC AT AN ON-RAMP	118
<i>Oliver Stein, Stefan Kaufmann, Michael Watzko, Hubert Rehborn, Jonas Paczia</i>	
MILLIMETER-WAVE TRANSMISSION TECHNOLOGIES OVER FIBER/FSO FOR 5G+ NETWORKS.....	124
<i>Rasha Al-Dabbagh, Hamed Al-Raweshidy</i>	
INTERLEAVED DATA PROCESSING SCHEME FOR OPTIMIZING TENSORFLOW FRAMEWORK.....	130
<i>Jinseo Choi, Minseon Cho, Donghyun Kang</i>	
TOWARDS A MULTISENSORY MIXED REALITY PLATFORM FOR THE IDENTIFICATION, MANAGEMENT, AND REHABILITATION OF SPORT-RELATED CONCUSSION	133
<i>Henry Griffith, Missy Fraser, Adam Hooker, Anne Boeckmann</i>	
AN OPEN SOURCE ELECTRIC VEHICLE SIMULATOR WITH BATTERY AGING MODELING.....	137
<i>Lucio Ciabattoni, Francesco Ferracuti, Enrico Marchegiani, Andrea Monteriù</i>	

Author Index