

2021 International Conference on Machine Learning and Cybernetics (ICMLC 2021)

**Adelaide, Australia
4 – 5 December 2021**



**IEEE Catalog Number: CFP21523-POD
ISBN: 978-1-6654-6609-7**

**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:	CFP21523-POD
ISBN (Print-On-Demand):	978-1-6654-6609-7
ISBN (Online):	978-1-6654-6608-0
ISSN:	2160-133X

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

Contents

Greetings from General Chairs

Greetings from Program Chairs

Organizing Committee

Program Committee

List of Reviewers

Contributed Papers

FUZZY INTERPOLATIVE REASONING BASED ON REPRESENTATIVE VALUES AND CHARACTERISTIC POINTS OF ROUGH-FUZZY SETS

SHYI-MING CHEN, RANGGI PUTRA WIHARJA1

NEURAL-BASED HIERARCHICAL FORMATION CONTROL OF MIXED-ORDER MULTI-AGENT SYSTEMS

YANG FEI, XIN YUAN, PENG SHI, CHENG-CHEW LIM9

DEEP GROUPED NON-NEGATIVE MATRIX FACTORIZATION METHOD FOR IMAGE DATA REPRESENTATION

ZIHAO ZHAN, WEN-SHENG CHEN, BINBIN PAN, BO CHEN15

FUSION OF COMPLEX NETWORKS-BASED GLOBAL AND LOCAL FEATURES FOR FEATURE REPRESENTATION

ZHENGRUI HUANG21

A NEW MULTICRITERIA DECISION MAKING APPROACH FOR UNIVERSITY RANKING: THE SKYLINE SIR METHOD

JUNYI CHAI, KEN CHENG, WENBIN LIU27

FUZZY LOGIC CONTROL FOR MULTI-ROBOT NAVIGATION AND ARRIVAL-TIME CONTROL IN A CLUTTERED ENVIRONMENT

YU-CHENG CHANG, YE SHI, ANNA DOSTOVALOVA, CHIN-TENG LIN, JIJOONG KIM, DANIEL GIBBONS33

CLUSTERING NETWORK-CONNECTED DEVICES USING AFFILIATION GRAPHS

KYLE MILLAR, ADRIEL CHENG, HONG GUNN CHEW, CHENG-CHEW LIM39

DETECTING BOTNET VICTIMS THROUGH GRAPH-BASED MACHINE LEARNING

KYLE MILLAR, LACHLAN SIMPSON, ADRIEL CHENG, HONG GUNN CHEW, CHENG-CHEW LIM46

WEARABLE HEADPHONE SYSTEM FOR PHYSIOLOGICAL MONITORING

CHIEN-NAN LEE, WEI-DA CHEN, YIU-TONG CHU, LING CHENG52

A COMPARISON OF UNSUPERVISED LEARNING ALGORITHMS FOR INTRUSION DETECTION IN IEC 104 SCADA PROTOCOL

MAHWISH ANWAR, ANTON BORG, LARS LUNDBERG57

ON DEGREE OF BONE HEALING FOR BONE FRACTURE TREATMENT BY ULTRASONIC WAVE

UEYAMA TAKUMI, KUMABE YOHEI, OE KEISUKE, FUKUI TOMOAKI, NIIKURA TAKAHIRO, KURODA RYOSUKE, MORIMOTO MASAKAZU, YAGI NAOMI, HATA YUTAKA	65
PERFORMANCE EVALUATION DIMENSIONAL REDUCTION TECHNIQUES FOR IMAGE CLASSIFICATION	
YONG HOON LEE, JAVAAN S. CHAHL	70
INTERVAL TYPE 2 INTUITIONISTIC FUZZY SETS RANKING METHOD BASED ON THE GENERAL GRADED MEAN INTEGRATION REPRESENTATION WITH APPLICATION TO MULTIPLE CRITERIA DECISION MAKING	
KUO-PING CHIAO	76
GENE EXPRESSION DATA CLASSIFICATION AND PATTERN ANALYSIS USING DATA DRIVEN APPROACH	
AIMAN JABEEN RAMISA, ANANNA HOSSAIN, SK MD INJAMUL ISLAM, PONUEL MOLLAH SWADESH, MD. TOUSHIF ISLAM, MD ANISUR RAHMAN, MOHAMMAD ZAVID PARVEZ.....	82
BIDIRECTIONAL SELF-RECTIFYING NETWORKS WITH BAYESIAN MODELLING FOR FEATURE DETECTION AND KEYPOINT ALLOCATION	
QIUCHEN ZHU, QUANG HA	91
DETECTION OF CROP LEAF DISEASES USING GL-CGAN BASED DATA AUGMENTATION	
CHANG ZHU, YING LIU, JINHAI XIANG	97
DATA AUGMENTATION IN TRAINING DEEP LEARNING MODELS FOR MALWARE FAMILY CLASSIFICATION	
YUXIN DING, GUANGBIN WANG, YUBIN MA, HAOXUAN DING.....	102
LSSVM BOILER MAIN STEAM TEMPERATURE ANOMALY DETECTION ALGORITHM BASED ON IMPROVED SSA	
LEI LIU, TIANMU QIN, LI WANG, ZHENG WU.....	108
CNN BASED HIERARCHICAL INTRACEREBRAL HEMATOMA REGION EXTRACTION METHOD IN HEAD THICK-SLICE CT IMAGES	
OKA KAZUNORI, FUJITA DAISUKE, NOHARA YASUNOBU, SOZO INOUE, ARIMURA KOICHI, IIHARA KOJI, KOBASHI SYOJI.....	115
BRAIN DEVELOPMENT AGE PREDICTION USING CONVOLUTIONAL NEURAL NETWORK ON PEDIATRICS BRAIN CT IMAGES	
MORITA REN, ANDO SAYA, FUJITA DAISUKE, NII MANABU, ANDO KUMIKO, ISHIKURA REIICHI, KOBASHI SYOJI	120
BORING SURVEY BASED FRACTURE DETECTION (BSFD) FOR FRAGILITY FRACTURE OF THE PELVIS IN CT IMAGES	
NAOTO YAMAMOTO, DAISUKE FUJITA, RASHEDUR RAHMAN, NAOMI YAGI, KEIGO HAYASHI, AKIHIRO MARUO, HIROTSUGU MURATSU, SYOJI KOBASHI.....	126
ARTIFICIAL INTELLIGENT TECHNIQUES FOR SOLAR ENERGY GENERATION & HOUSEHOLD LOAD FORECASTING	
ZHANLIAN LI, CHUN SING LAI, ANBO MENG, XUECONG LI, ALFREDO VACCARO, LOI LEI LAI	131
RESEARCH ON THE OPTIMIZATION OF LOGISTICS TERMINAL NETWORK LAYOUT UNDER THE “NEW RETAIL” MODEL	
HONG-YING SUN, ZI-HAN LEE.....	135
SPARSE VARIATIONAL AUTOENCODER-BASED INTERPRETABLE BIMODAL WORD EMBEDDINGS	
JINGYAO TANG, WEIYU ZHONG, QIANHUA CAI, GUOJUN LU, ZHAO YAN, YUN XUE, XINGUANG LI	139
A CONTENT BASED AND COLLABORATIVE FILTERING RECOMMENDER SYSTEM	

VIGNESH THANNIMALAI, LI ZHANG	145
DEEP LEARNING-BASED HUMAN POSTURE RECOGNITION	
ADAM AYRE-STORIE, LI ZHANG.....	152
ACCELERATOR ON MULTI-GRANULARITY ATTRIBUTE REDUCTION FOR CONTINUOUS PARAMETERS	
DA-SHENG ZHAO, JING-JING SONG, TAI-HUA XU, ERIC C.C. TSANG	158
AN OBJECT-INDUCED FUZZY THREE-WAY CONCEPT LATTICE ANALYSIS BASED ON TWO THRESHOLDS	
LAN-ZHEN YANG, ERIC C.C. TSANG, XI-ZHAO WANG.....	164
DOUBLE-QUANTITATIVE-BASED KNOWLEDGE REDUCTION APPROACH TO INCONSISTENCY INFORMATION SYSTEM	
WEN-TAO LI, SHI-QI ZENG, TAO ZHAN, BING-JIAO FAN, ERIC C.C. TSANG.....	170
A MATRIX-BASED GRANULAR REDUCT APPROACH IN FORMAL CONTEXTS	
CHENG-LING ZHANG, ERIC C.C. TSANG, WEI-HUA XU, YI-DONG LIN	176
FUZZT SET-BASED KERNEL EXTREME LEARNING MACHINE AUTOENCODER FOR MULTI-LABEL CLASSIFICATION	
QINGSHUO ZHANG, ERIC C.C. TSANG, MENG HU, QIANG HE, DEGANG CHEN.....	182
AN IMPROVED K-MEANS ALGORITHM WITH SPATIAL CONSTRAINTS FOR IMAGE SEGMENTATION	
MENG HU, ERIC C.C. TSANG, YANTING GUO, QINGSHUO ZHANG	188
RULE ACQUISITION BASED ON MULTI-LEVEL COGNITIVE LEARNING IN MULTI-DECISION DATA	
BING-JIAO FAN, GUO-CHENG LI, ERIC C.C. TSANG, WEN-TAO LI.....	195