

# **2024 International Conference on Wavelet Analysis and Pattern Recognition (ICWAPR 2024)**

**Miyazaki, Japan  
20-23 September 2024**



**IEEE Catalog Number: CFP2419C-POD  
ISBN: 979-8-3315-2808-9**

**Copyright © 2024 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:	CFP2419C-POD
ISBN (Print-On-Demand):	979-8-3315-2808-9
ISBN (Online):	979-8-3315-2807-2
ISSN:	2158-5695

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Contents

<b>Greetings from General Chairs .....</b>	<b>I</b>
<b>Greetings from Program Chairs .....</b>	<b>II</b>
<b>Organizing Committee .....</b>	<b>III</b>
<b>Program Committee .....</b>	<b>VI</b>
<b>List of Reviewers .....</b>	<b>VII</b>

## Contributed Papers

<b>WAVELET FUNCTION PROPERTIES BASED ON SHANNON FUNCTION</b>	
ZUO-XIAN FU, QING LIN, CAI-XIA DENG .....	1
<b>DATA AUGMENTATION AND FEATURE FUSION TO IMPROVE GRAPH CONTRASTIVE LEARNING FOR RECOMMENDER SYSTEMS</b>	
YU-SHENG LIU, ZHAN-LONG WANG, ZHEN YANG, LI-XIANG XU, YAN CHEN, BING AI, YU SU .....	7
<b>IMPROVING QUESTION EMBEDDINGS FOR KNOWLEDGE TRACING WITH RESIDUAL GRAPH CONVOLUTIONAL NETWORKS</b>	
ZHAN-LONG WANG, YU-SHENG LIU, MIN ZHANG, NING LI, LI-XIANG XU, XIAO-FENG WANG, CHENG-LONG LI .....	13
<b>IAGNN:GRAPH NEURAL NETWORKS WITH INFORMATION AUGMENTATION</b>	
JIA-WANG PENG, KANG JIANG, XIN YUAN, ZHEN YANG, JUN PAN, CHEN ZHANG, LI-XIANG XU .....	19
<b>BK-MSSNN: BI-KERNEL BASED MULTI-SCALE SUBGRAPH NEURAL NETWORKS</b>	
KANG JIANG, JIA-WANG PENG, XIN YUAN, WEI XU, HE TONG, SHENG-BING CHEN, LI-XIANG XU .....	25
<b>FIELD OPTIMIZATION OF TOWER SOLAR HELIOSTATIC MIRROR BASED ON ANT-FIELD REFLECTOR ALGORITHM AND PARTICLE RAY TRACING OPTIMIZATION</b>	
ZI-HAN CHENG, JING-JING ZHANG, JUN PAN, BI-TENG CAO, LI-XIANG XU .....	31
<b>CAUCHY GRAPH NEURAL NETWORKS</b>	
JING-XU PAN, YU-LONG WANG, LONG-LONG CHEN, YOU-HENG LIU, HAN LI .....	37
<b>DETECTION OF STAINED ASBESTOS IN BUILDING MATERIAL MICROSCOPIC IMAGES USING EMPIRICAL WAVELET TRANSFORM</b>	
SATSUKI NISHIJIMA, HIKARU TOMITA, TERUYA MINAMOTO .....	43
<b>QUATERNION HIERARCHICAL ORTHOGONAL MATCHING PURSUIT</b>	
YI-MING DONG, CUI-MING ZOU .....	49
<b>ROBUST PRINCIPAL COMPONENT ANALYSIS BASED ON WELSCH LOSS AND HALF-QUADRATIC OPTIMIZATION</b>	
ZHI-YANG GONG, YU-LONG WANG, HAN LI, HUI-WU LUO .....	55

<b>MULTI-SENSOR FUSION APPROACH FOR CALIBRATING 2D LIDAR DISTANCE MEASUREMENT VIA FASTSAM IMAGE SEGMENTATION</b>	
SHAO-WEI CHU, CHUIN-MU WANG, MING-YU TSAI, YEN-CHING WU, YONG-HONG WANG.....	61
<b>ANIMAL BEHAVIOR MONITORING BASED ON SEQUENCE TO SEQUENCE MODEL</b>	
QING-ZHE CUI, XIN YUAN, JUSTINE PARTOON, ALEXANDRA L. WHITTAKER, LI-XIANG XU, LEI LIU, PENG SHI.....	67
<b>LEAF NAVIGATED PLANT GROWTH MEASUREMENT FOR AUTOMATED PLANT CULTIVATION SYSTEM</b>	
CHENG WANG, YUKO UKAI, YUICHIRO HAYASHI, MASAHIRO ODA, YOSHIKATSU SATO, KENSAKU MORI.....	73
<b>SMART: STOMA MEASUREMENT, ANALYSIS, REPORT TOOL FOR MICROSCOPE IMAGE AND ITS APPLICATION IN PLANT PHENOTYPING</b>	
CHENG WANG, KANANE SATO, YUICHIRO HAYASHI, MASAHIRO ODA, YASUHIRO ISHIMARU, NOBUYUKI UOZUMI, KENSAKU MORI.....	79
<b>MULTIMODAL LARGE MODEL IMAGE DATA AUGMENTATION BASED ON CUE ENGINEERING</b>	
XIANGYU ZHAN, WEI WANG, SHANGJUN MA, ZHAOWEI SHANG.....	85
<b>SCTV-TC: SCHATTEN SP\$-NORM AND CORRELATED TOTAL VARIATION FOR TENSOR COMPLETION</b>	
HAOYAN YANG, THOMAS WU, LINA YANG, TIANCHUAN YANG.....	91
<b>A ROOFTOP PV POTENTIAL ASSESSMENT METHOD BASED ON IMPROVED U-NET</b>	
JINHAO YANG, HAOLIANG YUAN.....	99
<b>A MATERIAL ESTIMATION METHOD FOR OUT-BUILDING SURVEY OF LOW-VOLTAGE DISTRIBUTION NETWORK INDUSTRY EXPANSION BASED ON GIS</b>	
HAO LIN, PEI-XIANG LIN, FENG-RUI CHANG, XIAO-WEN CHEN, QI-FAN YANG, XIAN-GANG PENG, FANGYUAN XU.....	105
<b>IMPROVED YOLOV8 MODEL BASED ON MULTI-SCALE CONTEXT AGGREGATION ARCHITECTURE</b>	
WENCHONG LI, JINGHUA WU, ZHENGYU ZHANG, YANPENG ZHAI, YUHANG LIU .....	113
<b>LIGHTWEIGHT ADAPTIVE PERCEPTION ATTENTION MODEL</b>	
JINGHUA WU, JINHAO YANG, JUNJIE LU, JIADAN LIU .....	118
<b>DIGITAL PERFORMANCE PREDICTION MODEL OF POWER GRID DISPATCHING BUSINESS BASED ON BP NEURAL NETWORK</b>	
WANTING YIN, YUHANG LIU, ZHIMIN WANG, YANPENG ZHAI, ZHAI SUN, FANGYUAN XU.....	124
<b>DISTRIBUTION NETWORK DIGITAL AUXILIARY INVESTMENT DECISION-MAKING METHOD BASED ON HIGHLY RELEVANT FEATURES</b>	
WANTING YIN, YIHAO AI, ZHIMIN WANG, YUHANG LIU, YIXIN SUN, FANGYUAN XU .....	130
<b>REAL TIME DETECTION MODEL FOR INDUSTRIAL APPLICATIONS</b>	
YANPENG ZHAI, JINGHUA WU, HAIPENG ZHANG, YU WANG, YUHANG LIU, FANGYUAN XU.....	136
<b>A DAY-AHEAD POWER PREDICTION ALGORITHM FOR PV POWER PLANTS BASED ON POWER MARKET BENEFIT AND BP</b>	
YU WANG, WANTING YIN, YANPENG ZHAI, HAIPENG ZHANG, FANGYUAN XU .....	142
<b>OPTIMAL SCHEDULING MODEL CONSIDERING THE AGGREGATION OF VIRTUAL POWER PLANT</b>	
JINGJING BAI, ZHENG XU, YE LU, MENG ZHANG, SHUYI FENG.....	148