

2025 2nd International Conference on Image, Signal Processing and Communication Technology (ISPCT 2025)

**Changzhou, China
5-7 December 2025**

IEEE Catalog Number:
ISBN:

CFP256AM-POD
979-8-3315-7943-2



Copyright © 2025, IEEE

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:	CFP256AM-POD
ISBN (Print-On-Demand):	979-8-3315-7943-2
ISBN (Online):	979-8-3315-7942-5

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

TABLE OF CONTENTS

DAGP2-YOLO: A Small Target Detection Algorithm for Moving Tennis Balls	1
<i>Jinfu Zhang, Kaizhe Zhan, Haowei Chen, Zhen Yang</i>	
Hierarchical Line Feature Matching in Complex Scenes: From Motion Consistency Clustering to Point-Line Geometric Verification	5
<i>Yufan Ge, Chenyang Zhang, Jianghua Xu</i>	
Grain Truck Recognition and Random Sampling Using an Attention-Enhanced YOLOv5s Network	15
<i>Zhicheng Sun, Yinhu Qiao, Chunyan Zhang, Yunlei Bai</i>	
An Improved Research on UAV Detection Based on Dynamic Feature Fusion	20
<i>Yuan Chai, Sining Cheng</i>	
LiTANet: Lightweight Semantic Segmentation Network with Triple Attention and Depthwise Separable Convolution for Remote Sensing Imagery	24
<i>Suye Chen, Xv Chen, Taiyao Pan, Yuxia Li</i>	
DyTANet: Dynamic Token Aggregation Network for Lightweight Image Super-Resolution	29
<i>Linchao Lu, Guo Chen, Wenlu Cai</i>	
A Multimodal Feature Alignment Approach for Algal Image Recognition and Semantic Explanation	38
<i>Xigang Wang, Zhenyu Liu, Daming Sun, Xiao Han, Na Chu, Huan Liu</i>	
Prostate Cancer Lesion Detection Based on Pseudo-Normal Image Generation Using Generative Adversarial Networks	44
<i>Yang Liu</i>	
Intelligent BIM Object Retrieval by Fusing Image Segmentation and Semantic Recognition	50
<i>Can Huang, Weijia Liu, Hui Li, Qiuyu Wang</i>	
A Study on Breast Cancer HER2 Status Prediction Based on Visformer and Stacking Ensemble	56
<i>Zixin Kang, Lifeng Deng, Huizhe Wang, Zhengshuai Tan, Ziqi Wang, Xiaochun Guo</i>	
Structural Extraction and Image Measurement Method for Complex Concrete Cracks	62
<i>Yang Yu, He Tianle, Chen Jie, Xu Xiaohua, Du Zhida, Zhang Chaoyuan</i>	
An improved steel surface defects detection method based on YOLOv5	67
<i>Yingjie Zhang, Wei Wu, Jilei Yin, Zhaohui Zhang, Shilin Lu, Wanzhen Wang</i>	
DPA-Net: Enhancing Fluorescence Microscopy Object Detection via Density-Guided Spatial Attention and Perceptually-Aware Diffusion	72
<i>Chunyan Zhao, Hengyi Zeng, Jie Li, Lei Wei, Xiuxian Li</i>	
DMAU-Net: A Novel Semantic Segmentation Model for Oil Spill Detection	80
<i>Xiaonan Chen, Yubo Wang</i>	
Fusing Dense Connections into Hierarchical Transformer for Efficient Image Super-Resolution	86
<i>Zhongze Luo, Shengling Geng, Mingcong Dang</i>	
BMSNet: A Colorectal Polyp Segmentation Network Based on Multi-Scale and Boundary-Focused Attention	94
<i>Xinyu Han, Yunpeng Ma</i>	

Robust Edge Segmentation via Threshold-Aware Attention and Dynamic Feature Selection	100
<i>Zhiyang Guo, Jiejia Wang, Baigan Zhao, Shun Zhang</i>	
Research on Multi-scale Feature Fusion based on High-Resolution Branch Enhancement for Small Target Ship Detection	104
<i>Jiang Ye, Xinye Zhao, Yujie Zhu, Maoyang Huang, Zengyang Wang</i>	
Efficient Object Detection and Depth Estimation Algorithms for Transportation Scenarios	110
<i>Hua Guo, Qinghua Zhai, Mingshang Lu, Changyu Jiang</i>	
Semi-Supervised Remote Sensing Image Change Detection with CT-SWBCE Loss and Reliable Pseudo-Labeling	116
<i>Yan Yang, Meiqi Jia, Yanning Wang, Jihui Zhang</i>	
Research on Classification-Segmentation Enhancement Technology for MRI Localizer Images Based on Deep Learning	120
<i>Yiyang Li, Jianghong Wu, Xing Yang</i>	
Adaptive diagnosis of Rotating Machinery using PSO-SVM classifiers based on GAVMD-MPE	124
<i>Bo Zhang, Wenli Hu, Tao Liang, Chunying Liu</i>	
A Complex-Valued Neural Network-Based Denoising Method for Millimeter-Wave Radar Images	128
<i>Pengxiang Qin, Zeyu Wang</i>	
A Two-Dimensional Defocusing Compensation Method for Space-Based Bistatic ISAR Based on Image Entropy and Quasi-Newton Method	134
<i>Yujie Wang</i>	
Amplitude and frequency characteristics analysis of vibration calibration link based on multi-frame FFT algorithm	140
<i>Yongyao Zhang</i>	
Channel large-scale separable convolution assisted underwater image enhancement	145
<i>Qilin Jin, Qingbang Han, Jiayu Xia</i>	
A Single-Core Parallel Neuromorphic Accelerator for Event-Driven Convolutional Neural Networks	150
<i>Chengxi Xiong, Liwei Meng, Pujun Zhou, Shaogang Hu, Guanchao Qiao</i>	
Illumination-Robust Offset Measurement System Based on Camera	155
<i>Jiadi Zhang, Jiajia Shi, Yuqi Han, Yanjun Gao</i>	
A Review on RGB-Thermal Image Fusion Based on 3D Gaussian Splatting	161
<i>Kaiwen Yu, Dong Lin, Pengyi Tian, Na Yang</i>	
Impact of Coupled Mesoscale Eddies on Broadband Deep-Sea Acoustic Signal Propagation	169
<i>Zengyang Wang, Weiming Xu</i>	
A Vital Sign Extraction Method for IR-UWB Radar Based on Adaptive Tracking and Sliding Singular Spectrum Analysis Under Micro-Motion Interference	174
<i>Heng Xu, Die Hu, Long Sun, Cheng Wang</i>	
TC-EEGNet: A Temporal Convolution Enhanced EEGNet for EEG Based Alcohol Addiction Classification	179
<i>Yuanchen Li, Jundi Wang</i>	

Low-Noise Sampling and Processing of Signals in Grating Interferometry	184
<i>Lei Wang, Qingyang Zeng, Linbin Luo, Xinghui Li</i>	
An Iterative Optimization Method for DEMON Spectrum Demodulation Band Selection	190
<i>Simao Ye, Shuyang Zhang, Xinyu Gu, Chao Ren, Hao Chen, Xiaobin Li</i>	
Development of a Multi-Channel Image Acquisition Card Using FPGA	195
<i>Kaige Zhang, Bo Zhang, Linjie Miao, Yusong Mu</i>	
TA-MTL: Task-Adaptive Meta Transfer Learning for Few-shot Learning	199
<i>Xiaobo Sun, Shuai Pan, Haozhu Zhao, Ming Xia, Wenyu Hu</i>	
Spinal Magnetic Resonance Imaging Super-Resolution Based on Improved Latent Diffusion Models	206
<i>Zhan Wang, Junfeng Jiang, Zhengming Chen, Jie Chen, Yanan Du, Feng Wang</i>	
Exploiting Temporal Redundancy with Generative Priors: A Transformer-based Framework for Low-Light Image Enhancement	213
<i>Miaomiao Tian, Shenshen Luan</i>	
Analysis of the Mathematical Relationship Between InSAR Coherence and NDVI based on Piecewise Polynomial Fitting	219
<i>Yangcan Wang, Yifan Feng, Zhaoxia Wang</i>	
Real-Time TBM Muck-Outlet Video Analysis via Stabilization and Interactive ROI-Guided Detection	226
<i>Xuhui Zhang, Xiuyuan Song, Jialiang Zhang, Wenliang Zhu, Zhuoer Zhang, Lingyue Meng, Yuqing Zhang Tianming Zhan</i>	