

2026 6th International Conference on Sensors and Information Technology (ICSI 2026)

**Zhengzhou, China
24-26 April 2026**

IEEE Catalog Number:
ISBN:

CFP264B9-POD
979-8-3315-8381-1



Copyright © 2026, 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:	CFP264B9-POD
ISBN (Print-On-Demand):	979-8-3315-8381-1
ISBN (Online):	979-8-3315-8380-4

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

Pneumatic Measurement System Design Based on Resource-constrained Controller	1
<i>Bo Li, Junguo Li, Anton Louise De Ocampo</i>	
Anti-noise FOCS using Self-Compensative Technique	6
<i>Qianhong He</i>	
Simulation Study on the Performance of Metglas/PZT-8 Magnetoelectric Sensors Incorporating Thermally Induced Prestress	10
<i>Dishu Huang, Zhibo Ma, Yuanhang Wang, Enzhong Song, Tianyang Zhang</i>	
An AWE–Accelerated Full-Slice 3-D FEM for Accurate and Efficient Modeling of SAW Resonators	16
<i>Hong Zhang, Shengyang Xie, Jiabao Sun, Hao Jin</i>	
A Non-Intrusive Flow Inversion Model Based on Dimensionless Analysis	20
<i>Yongfeng Li, Lei Liang, Rongchang Wu, Shu Dai, Chengyi Zhong</i>	
Research on the Acoustic Emission Mechanism of Superfluous Metallic Contaminants in Slurry Preparation Process Based on DEM	25
<i>Donggang Cui, Xuan Gao, Xuefei Li, Li Tian, Qing Zhang</i>	
Design and Implementation of MCU-Based Sensor Signal Acquisition and Wireless Transmission System for Flower Greenhouses	34
<i>Xiang Wang, Yingxun Wang, Yanchun Liu, Caifeng Wang</i>	
A Metallic Ring-Shaped Interferometric Fiber-Optic Accelerometer	40
<i>Zhiyin Xia, Xiaoling Tong, Yutang Dai, Bo Zhao</i>	
Development and performance analysis of a highaccuracy six-axis force sensor	45
<i>Sen Liu, Kun Jiang, Huanhuan Yan, Na Zhang</i>	
Study on Strain Measurement Method for Torque Sensors in Electric Actuators	50
<i>Li Liu, Yinchuan Wu</i>	
Study on the Measurement Scheme of Formation Principal Stress	55
<i>Yuxin Zhang, Dengpan Zhang, Yongjie Wang</i>	
Integrated Design Technology of RF Transceiver Front-End for Radio Altimeter	60
<i>Shilong Zou, Sufang Gao, Dongfei Zheng</i>	
An Electrical Damping Method for Ring-Down Reduction in Air-Coupled PMUTs	68
<i>Yifan Guo, Zhitian Shen, Yaoyao Cui Suzhou, Yang Jiao</i>	
Simulation and Analysis of EM Fields and Surface Currents on Spherical Resonant Cavities	73
<i>Rui He, Yi Jin</i>	
Research Progress on Temperature and Humidity Composite Sensor Technology	77
<i>Jinyu Jiang</i>	
A Small-Range High-Resolution Linear Displacement Encoder Based on Electromagnetic Resonance	82
<i>Longjun Fang, Xuefan Bian, Baiyang Liu, Liang Wu</i>	

Research on splicing method of eddy current displacement sensor	86
<i>Xuhan An, Hanxu Zou, Yang Yu, Liang Wu</i>	
A Single-Axis Force Sensor Based on Electromagnetic Induction	90
<i>Yuan Tan, Sumei Yu, Yuxuan Zhang, Liang Wu</i>	
Detection of Environmental Tobacco Smoke Using a Multi-Sensor Array Integrated E-nose	94
<i>Yifei Wu, Long Zhang, Zanhong Deng</i>	
Room temperature fabricated WO ₃ -X-based hydrogen sensor with ultra-high detection range	103
<i>Jie Wei, Yuan-Bo Zhang, Xiao-Cong Tang, Jon-Min Oh, Cong Wang</i>	
Mechanisms and Applications of Volumetric Water Content and Matric Suction Sensors in Rainfall-Induced Landslide Monitoring	107
<i>Zongheng Xu, Lingxu Li</i>	
Design of High-Sensitivity Piezoresistive Accelerometer Based on Multi-Objective Optimization	111
<i>Boyang Li, Yong Xia, Chen Jia, Min Li, Xiangguang Han, Jun Du</i>	
An Electronic Nose Based on Gas Sensor Microarray for Malodorous Pollutants Detection	116
<i>Yao Zhou, Yan Hu, Yiwei Jiang, Zhongbin Xu, Longchao Yao</i>	
Design of Data Recorder and Fault Early Warning System for Elevator Braking Process	121
<i>Zhuo Chen, Yang He, Zhenli Yang, Hang Cheng, Tao Liu, Haoran Zhu</i>	
An Embeddable Liquid Metal based Sensor for Cable Vibration Monitoring	126
<i>Zongchen Su, Qi Su, Shiqi Zhao, Hao Jin, Hao Wang, Minyi Xu</i>	
Effects of Structural Parameters on Output Signals of Planar Capacitive Sensor	130
<i>Yurong Sun, Hang Guo</i>	
Fiber Optic Temperature Sensors and Machine Learning-Fused Signal Demodulation Methods	134
<i>Zhanlu Zhang, Feng Xia, Bo Liu, Yulong Gu</i>	
A Low-EMI Spread-Spectrum Clocking Circuit with Digital Calibration for High-Precision MCU On-Chip Oscillators	138
<i>Tianyuan Liu, Xu Meng</i>	
Research on Key Technologies of Dual-Energy X-ray Bone Mineral Density Measurement	142
<i>Xinwen Chen</i>	
Humidity Diffusion Simulation and Humidity Sensor Response Performance in the Narrow Internal Spaces of Cables	146
<i>Haoxiang Li, Dian Fan, Wenjia Chen, Long Chen, Simeng Zhang, Fang Liu</i>	
Intracavity Temperature Sensor Based on Phase-Shifted Fiber Bragg Grating in a Fiber Laser	151
<i>Boqiang Lin, Yihua He, Renan Xu, Weihao Lin</i>	
Finite Element Analysis and Structural Optimization of a Tubular Piezoelectric Ceramic Hydrophone	155
<i>Ling Huang, Ziqing He, Jinwei Zhou, Xiaohua Zhong</i>	
KOH Concentration Measurement under Multiple Scenarios with Conductivity-Temperature Coupling	164
<i>Chengxi Mu</i>	

Highly sensitive fiber optic sensor for hydrogen detection in transformer oil based on WO ₃ -Pd ₂ Pt-Pt nanocomposite film	169
<i>JiXiang Dai, Zhengan Tang, Zhouyang Wu, Minghong Yang</i>	
Self-diagnosis Method for Sensor Array Faults in Intelligent Drilling Rigs	173
<i>Xin Xu, Jinqiu Hu, Shengli Chu, Kun Tian, Yiyue Chen, Jingzhi Cui</i>	
A Multi-Channel Vibrating-Wire Collector with CNN-Based Diagnosis and Conditional Recovery	178
<i>Haoxuan Li, Ying Peng, Sihan Wang</i>	
A Vehicle-Mounted Measurement Method for Longitudinal Slope of Unclassified Roads Based on Adaptive Wavelet Denoising	182
<i>Guoqing Yang, Guoliang Zang, Ping Li, Wenjie Yu, Yong Luo, Xiyu Huang</i>	
Research on High-Resolution LiDAR System Based on MEMS	186
<i>Leiyang Zhai, Taoyin Wang</i>	
Self-Powered Micro-Vibration Energy Harvesting System for Online Health Monitoring Nodes on Transmission Line	192
<i>Sheng Ye, Jie Yang, Yeming Lai, Zhenyu Zi, Junan Chen, Hongxiao Yang</i>	
CMOS Image Illumination Compensation Algorithm in Chlorophyll Estimates using RGB Imaging	197
<i>Yi Yang, Dianyou Kang, Anton Louise De Ocampo</i>	
Fault Diagnosis of Power Cables Based on SA-PSO-Optimized VMD and Feature Fusion	202
<i>Yuhua Xing, Yaolong Yin</i>	
Beamforming Enhancement Using Unipolar Directivity of Pressure-Gradient Vector Hydrophone	208
<i>Zan Li, Xinjing Huang</i>	
A Polar-Coordinate Analytical Localization Method for Moving Targets with Active Multistatic Sonar	213
<i>Gengchen Liu, Bin Zhou</i>	
A Spatio-temporal dynamic fusion cooperative sensing method based on online EKF compensation	219
<i>Zhibin Gao, Changjin Yang, Junxiang Yao, Lianyou Lai</i>	
MF-YOLO: A Multi-Modal Fusion and Lightweight Fish Fry Detection Algorithm	224
<i>Dianyou Kang, Xihuan Su, Yi Yang, Melmar Eje, John Carlo Aggari, Anton Louise De Ocampo</i>	
Research on Multi-Scene Violation Detection Based on MSR-YOLOv11	229
<i>Siyuan Wu, Yuhan Li, Qi Sun, Shijie Jin, Guangli Xu</i>	
Rotor load decoupling method based on geometric modal projection	235
<i>Feng Cao, Lei Liang, Shu Dai, Weijian Zhong, Tianmingxuan Cao</i>	
RAPNet-EEG: A Representation-Attention Pyramid Network for Automatic Epileptic Seizure Detection from EEG Signals	240
<i>Chenyang He</i>	
An Algorithm for Detecting Debris on Riverbeds Based on an Improved YOLOv11n Model	245
<i>Shuo Liu, Fanghua Liu</i>	
Research on Cooperative Detection Methods Based on Target Angle Information	249
<i>Mengjun Zhang, Feihong Sun, Shuaishuai Liu, Jiajun Zhang</i>	

Precise fault traveling wave location of distribution lines based on primary and secondary integrated switchgear and COOSVMD-FWEO	256
<i>Zeming Chen, Quanhui Liu, Xingyuan Xu, Honglian Gao, Jiangbo Wei</i>	
Reliability-Guided Frequency Compensation Network for Multi-Exposure Image Fusion	263
<i>Xudong Li, Zhongqiu Zhao</i>	
Experimental Results of Three-Dimensional Imaging Using a Sparse MIMO Array Radar	269
<i>Junkai Yu, Yu Lan, Zhuyu Li, Chujun Lan, Jianxiong Zhou</i>	
A Hierarchical Network for Multi-Source Image Matching with Optical Flow	274
<i>Yandong Ning, Ruiming Jia, Chaoyue Wang, Zhangqi Xu, Penghao Sun</i>	
Illumination-Guided Multispectral Small Object Detection with Gated Attention	278
<i>Jing Zhang, Ruiming Jia, Zhuning Li, Yuxiang Chai</i>	
Enhanced Poisson Multi-Bernoulli Filter for Multi-Group Target Split-and-Combine Tracking	282
<i>Chao Xiong, Moufa Hu, Huanzhang Lu, Fei Zhao</i>	
A Lightweight Amplitude-Response-Driven Reverse Identification Method for Unknown Second-Order Filters	293
<i>Haolin Wen, Yuqian Jing, Dawei Lu</i>	
YOLO-MDL: An Enhanced Gaussian Metric Ship Detection Algorithm Combining Dual-Scale Selective Attention and Multi-Frequency Feature Fusion	297
<i>Qin Wang, Yuqing Song</i>	
Performance degradation method of rolling bearing based on refined composite multiscale entropy weighted by sensitive features	301
<i>Di Xu, Fangyi Li, Xinyu Xu, Fenyu Gu, Yaping Wang, Lei Teng</i>	
A Hierarchical Fusion Method Based on Dempster-Shafer Theory for Interoperability Assessment of Complex System	306
<i>Wen Yang, Jiajie Sun, Junhao Li, Zhekai Pang</i>	
Radar/Infrared Dual-Mode Anti-Jamming Fusion Method in Complex Confrontation Environments	314
<i>Xiang Zheng, Xiaoyang Zhang, Jinxin Liang</i>	
Inversion of Electromagnetic Logging-While-Drilling Data Based on TCN-LSTM	322
<i>Yuyang Qi, Jiaqi Xiao, Shihao Zhou, Xiao Liu</i>	
A Spatial Filtering Interference Suppression Algorithm Based on Fast Estimation of Wideband Signals	327
<i>Yikun Ruan</i>	
YOLOv5-MST: Mode Selection Transformer for All-Weather Ship Detection	333
<i>Jiayan Hu, Honglu Yang, Zhigao Shang, Fan Xu</i>	
An Intelligent Vehicle Target Detection Method Based on LiDAR	339
<i>Yikai Ding, Shoubiao Tan</i>	
FPGA-Based Window Filtering for Wireless Charging FSK Demodulation	344
<i>Wen Jiang, Wentao Ma, Ziheng Yang</i>	

Dual-Mode Adaptive Memory-Anchored Target State Estimation Based on Shooting Event Triggering under Dense False Measurements	348
<i>Luyun Xu</i>	
Music Pitch Recognition and Audio Signal Feature Modeling Based on Machine Learning	354
<i>Jizhe Shao, Feng Xiao</i>	
Adaptive Identification Method for Potential Landslide Hazards Based on Temporal InSAR Dual-Track Complementary Fusion	358
<i>Hao Zhang</i>	
PSEF-Net: A Spiral-based Attention Edge Fusion Network for Parkinsons' Disease	362
<i>Yixin Lin, Haoming Ye, Cheng Yang, Xiaolong Chai</i>	
Time-Series Vibration Signal-Based Continuous Label Prediction Using 1D-DTNet Model	366
<i>Licheng Cao, Yaoyang Tang</i>	
YOLO-CTB: A Lightweight Framework for Cotton Top Bud Video Detection in Complex Agricultural Environments	371
<i>Jiangchao Liu, Liuruizhi Jia, Shengquan Liu</i>	
A Lightweight Multi-Scale Edge Information Enhancement Network for UAV Small Object Detection	375
<i>Yuhang Tian</i>	
YOLOv11-WSSOD: An Improved Algorithm for Water Surface Small Object Detection	380
<i>Haoyi Xie, Huiying Zhang, Yu Qiao, Jiayu Zhao, Changling Li</i>	
An Enhanced YOLOv11-Based Algorithm for Identifying Unhelmeted Power Plant Workers	384
<i>Qinbo Ren, Yapeng Su, Kuilong Zhang</i>	
Research on Nonlinear Compensation Method for Ozone Concentration Based on Improved Whale Optimization BP Neural Network	389
<i>Weifeng Zhai, Huayu Guo</i>	
Near Field Beamfocusing via Weight Vector Orthogonal Decomposition	396
<i>Kanghao Zhang</i>	
A Lightweight YOLOv8 for Vehicle Detection in Complex Road Environments Based on EfficientNet and Coordinate Attention	400
<i>Sisi Liu</i>	
Enhanced U-Net with Prior Disentanglement and global topology enhancement for ROP Vessel Segmentation*	404
<i>Weice Wang</i>	
FMM-YOLO: A Lightweight Pest Detection Method with Frequency Modeling and Feature Fusion	408
<i>Jiale Hu, Jiangchao Liu, Shengquan Liu</i>	
Adversarial Attack Algorithm for Image Captioning Based on Semantic Alignment	412
<i>Dehai Zhang, Jiajun Zhu, Jiaqi Mao</i>	
Parameter Estimation of Intermittent Sampling Repeater Jamming Based on Orthogonal Block-Concatenated Waveform Design	422
<i>Chang Zhou, Wenfeng Chen, Zhu Tang, ALei Chen</i>	

Research on Image Recognition Method Integrating Convolutional Neural Networks and Transformers	429
<i>Kun Feng, Qiaoqiao Feng, Danyang Tian, Xue Yang, Junhong Yang, Tianxiang Wen, Yibo Wang</i>	
A Multi-Scale Feature Fusion Network for Dual-Scenario Electromagnetic Signal Recognition	433
<i>Bin Wang, Chen Chen, Feng Wang, Lijun Zhang</i>	
Multi-Sensor Information Fusion for Indoor Positioning Based on UWB and IMU with Deep Learning Optimization	439
<i>Enning Cao</i>	
Development of a Non-invasive Blood Glucose Wristwatch System Based on PPG Signal	443
<i>Yutong Liu, Guangyu Zhang, Hongyu Zhu, Jian Liu</i>	
Research on Projectile Pose Measurement System for Weapon Separation Based on Multimodal Fusion	447
<i>Chengxin Wang</i>	
Constrained Learning-to-Rank for Controlled Trade-offs in Multi-Objective Ranking Systems	452
<i>Zeyu Huang, Zichen Pan, Kaili Zhang, Yilun Wu, Hejun Huang, Xikai Yang</i>	
Intelligent Warehouse Path Planning Using an Enhanced Artificial Swarm Algorithm	458
<i>Shixiong Wei, Hongfei Liao, Anton Louise P. De Ocampo</i>	
Explainable AI Cloud Security Framework with Automating SIEM Event Management	465
<i>Yuanyuan Liu, Harrison Bai, Joel Coffman, Weijun Ma</i>	
AUV Path Planning Under Ocean Current Disturbances Based on Deep Reinforcement Learning	474
<i>Bingbing Cai, Fanghua Liu</i>	
An Adaptive Variable-Resolution Mapping Method for Non-Standard Roads in Hilly Terrain	480
<i>Yong Luo, Guoliang Zhang, Wenjie Yu, Ping Li, Guoqing Yang, Xiyu Huang</i>	
Safety-Enhanced Hybrid A* Path Planning for Unclassified Roads Based on Hierarchical Map	485
<i>Xiyu Huang, Guoliang Zhang, Wenjie Yu, Ping Li</i>	
Design and Implementation of an Intelligent Safety Monitoring System for the Elderly Using Simulated Sensor Data on the Huawei Cloud Platform	490
<i>Wenxiu Wang, Chenchen Yang, Norhana Arsad, Pingping Hao</i>	
Research on Construction and Virtual Commissioning of Intelligent Warehousing System Based on PQFactory Platform	496
<i>Runsheng Hao, Guohao Feng</i>	
Discrete-Time Sliding Mode Control for Photoelectric Navigation Vehicles with Adaptive Super-Twisting Observer and Fractional-Order Anti-Windup	504
<i>Shuyi Zhu, Bingzhen Jiang</i>	
Design and Implementation of Wireless Charge and Discharge System Based on Qi Protocol and Its Sensor-based Location Positioning Application	510
<i>Manfeng Jiang, Changzhang Wang</i>	
Optimizing Campus Security Systems: Leveraging Ontologies and Large Language Models to Enhance Detection Accuracy and System Reliability	514
<i>Yangyi Xia, Shiyu Liang, Fuhong Jiang, Xian Huang</i>	

A review of autonomous obstacle avoidance and path planning technology for micro-UAVs in complex environments	519
<i>Xunyao Wang</i>	
Comparative Study of Swarm Intelligence Algorithms for 3D UAV Path Planning	524
<i>Jinlong Ma, Liping Liu, Xuehong Sun, Zhenkun Ma</i>	
Modeling and Optimal Control of Vehicle Active Vibration Suppression Based on Centrifugal Actuators	528
<i>Ganggang Lian, Yu Zhang, Haiyan Xu, Yizhe Song, Yuzhe Li, Bing Xu</i>	
Research on the Temperature Prediction Model Based on ARIMA-CNN-BiLSTM	533
<i>Shanshan Fu, Jingping He, Tao Jin</i>	
Weather prediction algorithm based on CNN-ONLSTM	538
<i>Shanshan Fu, Jingping He, Tao Jin</i>	
Deep Learning-Based Student Behavior Monitoring in Smart Classrooms	543
<i>Lin Huang, Ting Li, Sartbekova Nurzhan Koodoevna, Hang Cui</i>	
Anonymous Aggregation Node Election Protocol for WSN Based on Load Balancing	547
<i>Fanfeng Kong, Weihong Cai, Xiangshuo Kong</i>	
An Autonomous Fault Monitoring Method for GEO Satellite Solar Arrays Integrating Physical Models with Data-Driven Techniques	552
<i>Chaoqun Li, Hao Jin, Qingguang Zhao</i>	
Multi-Step Knee Joint Angle Prediction for Lower-Limb Exoskeletons Using Temporal Convolutional Networks	559
<i>Xiao Zhang, Shuting Cao, Kangqian Cai, Yuanyuan Zu, Xiao Chen</i>	
Multi-Robot Kinodynamic Planning with Integrated Task Scheduling for Industrial Inspection	565
<i>Runfeng Dai, Shengxin Su</i>	
Research on the application of multidimensional data based on GIS in the digital twin system	570
<i>Zhisheng Li, Yixin He, Chen Ying</i>	
GSPA:Geo-Semantic Prior-Guided Attention for Long-Horizon Robot Manipulation	578
<i>Kai Che, Linbo Wang, Yifei Wen, Haixiang Wang, Yue Cheng, Jingguo Sun</i>	
Autonomous Blanket Covering for Service Robots	583
<i>Song Jiang, Bin Zou</i>	
Robust Initial Alignment for Industrial Autonomous Vehicles Under Severe Vibrations: A Dynamic Kernel VB-MCC-KF Approach	589
<i>Dongyang Li, Shuo Yang, Qiuying Wang</i>	
An Integrated Framework for Vehicle Path Planning in Oil Field Environments via Trajectory Mining and Jump Point Search	593
<i>Runfeng Dai, Shengxin Su</i>	