

2020 International Conference on Sensing, Diagnostics, Prognostics, and Control (SDPC 2020)

**Beijing, China
5 – 7 August 2020**



**IEEE Catalog Number: CFP20L29-POD
ISBN: 978-1-7281-7051-0**

**Copyright © 2020 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:	CFP20L29-POD
ISBN (Print-On-Demand):	978-1-7281-7051-0
ISBN (Online):	978-1-7281-7050-3

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

005_Final	Data Association Based Fast Fault Detection for Low Cost Micro/Nano Satellite	1
	<i>Rongli Chen,Xiaodong Wang,Yangming Guo,Weihua Qin,Ximing Zhang</i>	
006_Final	A new quantitative reliability calculation method for complex system with shared signals	5
	<i>Pengbo Zhang,Huina Mu,Xiaojian Yi,Shijie Wei,Hongmei Yan,Li Li</i>	
009_Final	Health Status Assessment for Integrated Transmission Device of a Type IFV Based on Dynamic Inferior Degree	11
	<i>Yingshun Li,Yu Xiao,Xiaojian Yi,Haiyang Liu</i>	
010_Final	Establishment of Wind Turbine Energy Efficiency Index System Based on F-neighborhood Rough Set	17
	<i>Chengbing He,Li Ma,Runze Wang,Xiaoxiang Zhang</i>	
011_Final	Research on On-line Monitoring Technology of Oil Wear Particles Based on Improved Otsu Algorithm	22
	<i>Yingshun Li,Xiangguang Meng,Xiaojian Yi,Jianxin He,Zhe He</i>	
015_Final	Research on Prediction Method of Armored Vehicle Fire Control System Based on BAS-RVM	26
	<i>Yingshun Li,Runhao Li,Xiaojian Yi,Haiyang Liu</i>	
016_Final	A Fault Diagnosis Method For Fuel Injectors Using Machine Sound	30
	<i>Tien-Trien Le,Takahiro Sagara,Shogo Kunioka,Satoshi Inose</i>	
019_Final	Research on the Reliability Modeling And Analysis Method of Phased-Mission System Based on GO Method	35
	<i>Shijie Wei,Huina Mu,Xiaojian Yi,Pengbo Zhang,Hongmei Yan,Li Li</i>	
020_Final	A Virtual Data Service Method Based on Autoregressive Model Optimized by Particle Filter	43
	<i>Zhongdong Jiang,Tingting Jiang,Xinfeng Wang,Hongzheng Fang</i>	
022_Final	Expert System for Comprehensive Transmission Fault Diagnosis Based on Oil Sensor	49
	<i>Yingshun Li,Tingyang Li,Xiaojian Yi,Haiyang Liu</i>	

023_Final	Output Reliability Assessment of Nuclear Initiating Explosive Device Based on Bootstrap Method	55
	<i>Yuxi Tao,Haiping Dong,Xue Dong,Jingjing Zhang,Jie Wang</i>	
027_Final	High sensitivity and fine diameter fiber optical hydrophone for towed array sonar	60
	<i>Duanming Li,Minxue Gu,Jiangfei Hu,Ruixuan Qu,Bobin Zhou,Wei Zhang</i>	
028_Final	Design of data acquisition system for ejection bench	64
	<i>Yong Zhou, Jiaying Lou, Qinyu Jiang, Hao Zhou</i>	
029_Final	Modeling Functional State Degradation of Manufacturing System Based on Coupling Operational Factors	N/A
	<i>Yao Li,Yihai He,Xiao Han,Wenzhuo Wang</i>	
030_Final	Machine Speed Condition Monitoring using Statistical Time-Domain Features Modeled with Graph	76
	<i>Xinlai Ye,Xin Wen,Zhenjie Zhu,Guoliang Lu</i>	
031_Final	Research on Maintenance Interval of Rocket Ejection Seat Based on Thread Wear of Screw Drive Component	N/A
	<i>maogang Wu,huajin Lei,baoliang Xiao,wubin Xiong,wensheng Wang,haiping Dong</i>	
032_Final	Evaluation Method of CMOS Devices Reliability at Cryogenic Temperature Based on SSI Model	87
	<i>Xueqi Yang,Guicui Fu,Bo Wan,Yutai Su</i>	
033_Final	Functional Failure Diagnosis Method of Manufacturing System Based on Dynamic Bayesian Network	93
	<i>Wenzhuo Wang,Yihai He,Xiao Han,Yao Li</i>	
034_Final	Fault Diagnosis Based on 1D-CNN with Associated Auxiliary Tasks Boosted for Wheelset Bearings of High-Speed Trains	98
	<i>Junjie Liu,Huan Wang,Zhiliang Liu,Zilin Wang</i>	
035_Final	Reliability Evaluation of Secondary Power Module under Aerothermodynamic Comprehensive Effect	104
	<i>Xiaokai Huang,Zhenweix Guo,Zemin Yao,Shouqing Huang</i>	
041_Final	A Multi-Fault Feature Detection and Separation Method for Multistage Gearbox	110
	<i>Bing Li,Xining Zhang</i>	

042_Final	Modeling the health state of complex systems with component dependency based on grey clustering	115
	<i>Jie Tao,Zixuan Fang,Xiaodong Wang</i>	
043_Final	Operational state evaluation and maintenance decision-making method for multi-state CNC machine tools based on partially observable Markov decision process	120
	<i>Zixuan Fang,Xiaodong Wang,Lifang Wang</i>	
044_Final	An Empirical Expert Study on the Status Quo and Potential of Predictive Maintenance in Industry	125
	<i>Simon Zhai,Stephanie Achatz,Michael Groher,Jordy Permadi,Gunther Reinhart,</i>	
045_Final	Quality maintenance approach for manufacturing system based on mission reliability	131
	<i>Di Zhou,Yihai He,Yixiao Zhao,Anqi Zhang</i>	
046_Final	Bearing Faults Diagnosis for Axle-Box of High Speed Train Based on Cepstrum Pre-Whitening and Envelope Demodulation	137
	<i>Zhongdong Jiang,Weigang Hu,Hongzheng Fang,Huanzhen Fan</i>	
047_Final	Aircraft Engine Transient Performance Analysis Considering Control and Protect Logic	N/A
	<i>Shu Zhang,Zhanbao Gao,Yinghao Hao</i>	
052_Final	A method for intermittent fault diagnosis of electronic equipment based on labeled SOM	149
	<i>Weiwei Cui,Weikang Xue,Lianfeng Li,Junyou Shi</i>	
057_Final	MOOD Applied to EMIS based on jBPM	155
	<i>Yichen Wang,Qiang Han,Haide Liu,Feng He,Cong Liu,Zijian Mao</i>	
060_Final	Conceptual design and test of a tilting quadrotor morphing UAV with adaptive foldable wings	N/A
	<i>Huangchao Yu,Shengde Jia,Jialong Gao,Su Cao,Li Yu,Junqi Lu,Lizhen Wu</i>	
066_Final	A Generic IoT Framework for Sport-specific Movement Recognition	169
	<i>Tongtong Yan,Dong Wang,Yufan Wang,Jinzhen Kong,Zhihao Bi,</i>	
071_Final	A Prediction Method of Gearbox Wear Volume Based on Ferrography Analysis and Grey System Theory	173
	<i>Dehao Dong,Huijun Wang,Yingen Meng,Zhijia Zhang,Cheng Xu,Lijun Zhou</i>	

072_Final	An Adaptable Cost-sensitive Imbalanced Fault Diagnosis Method Considering Sample-significance Information	178
	<i>Xinwei Jiang,Biao Wang,Yaguo Lei,Naipeng Li</i>	
073_Final	Non-local Denoising Convolutional Neural Network for Rolling Bearing Vibration Signal	184
	<i>Haoran Han,Huan Wang,Zhiliang Liu,Zixiao He</i>	
077_Final	Fault diagnosis method for multiple fault system based on multi-source information fusion	189
	<i>Xiaodong Wang,Fengyong Lang,Zhaoming Tan</i>	
084_Final	A novel cyclostationarity-based blind demodulation method for the diagnosis of bearing	194
	<i>Kaixuan Liang,Chuancang Ding,Jinyang Jiao,Yonghao Miao,Ming Zhao,Jing Lin</i>	
085_Final	Research on SVM Fault Diagnosis Method Based on Text Feature Extraction Algorithm	199
	<i>Gaozheng Xu,Zixuan Fang,Lifang Wang</i>	
089_Final	Fault Diagnosis of Armored Vehicle Engine Based on Oil Sensor	204
	<i>Yingshun Li,Guoying Zhang,Xiaojian Yi,Jianxin He</i>	
098_Final	Application of Generative Adversarial Networks-based Semi-supervised Learning For Unlabeled Bearing Diagnosis	209
	<i>Xiaosong Xing,Wei Guo</i>	
099_Final	A Novel Graph-based Hierarchical Fault Propagation Modeling Approach for Complex Systems	216
	<i>Peng Zhao,Shuming Du,Yongle Lyu,Jinxiong Zhan</i>	
100_Final	Health Assessment of Armored Vehicles Based on K-means	223
	<i>Yingshun Li,HongLi Zheng,Xiaojian Yi,Haiyang Liu</i>	
101_Final	Research status and key technologies of intelligent technology for Unmanned Surface Vehicle system	229
	<i>Fengchi Xu,Yangliu Xlie,Xingchen Liu,Xiao Chen,Wei Han</i>	
102_Final	Mixed-kernel Slow Feature Analysis Based Feature Extraction on Civil Aero-engine gas path parameters	234
	<i>Hao Sun,Xuyun Fu,Shisheng Zhong,Wenhui He</i>	

103_Final	Fault Prediction and Health Management Technology of Fire Control System	242
	<i>Yingshun Li ,Tong Zhou,Xiaojian Yi,Haiyang Liu</i>	
104_Final	Fault Diagnosis Method of Integrated Transmission Device Based on Rough Set and BP Neural Network	247
	<i>Yingshun Li,Qiongqiong Wu,Xiaojian Yi,Haiyang Liu</i>	
106_Final	Transiting Target Value Based Path Following Control of Unmanned Surface Vessel	252
	<i>Jiangfeng Zeng,Yangliu Xie,Xiaoye Guo,Xingchen Liu,Wei Han</i>	
107_Final	Prediction of Gate Valve Closing Fault Trend Based on Relevance Vector Machine*	257
	<i>Jie Liu,Tianjiao Shi,Li Zhan,Lin Zhang,Zhu Ou,Mian Zhang</i>	
113_Final	Investigation of the Effects of Salt Contamination on Electrochemical Migration of Printed Circuit Boards by Temperature Humidity Bias Tests	261
	<i>Yirun Zhao,Yilin Zhou,Wenrui Lu,Ying Li</i>	
114_Final	Open-Circuit Fault Diagnosis for Three-Phase Inverters Using a Step-GA-BP Algorithm	267
	<i>Haolan Shen,Xin Tang,Yaxiang Fan,Yachen Wang,Yifei Luo,Sheng Ai</i>	
115_Final	Fault Diagnosis Method of Analog Circuit Based on GA-OS-ELM	273
	<i>Peng Zhang,Yanping Huang,Mengting Li,Yan Wang,Pengfei Wen,Shengyue Wang,Shaowei Chen</i>	
116_Final	Power output monitoring and anomaly identification of photovoltaic systems using graphical modeling	279
	<i>Yonghua Chen,Xiaochen Zhang,Gang Liu,Rui Wu,Chao Liu,Dongxiang Jiang</i>	
120_Final	An Efficient Rail Recognition Scheme Used for piloting Mini Autonomous UAV in Railway Inspection	284
	<i>Yuxin Guo,Xiaofeng Li,Linmin Jia,Yong Qin,</i>	
121_Final	A Visual Saliency based Railway Intrusion Detection Method by UAV remote sensing image	291
	<i>Ling Guan,Xiaofeng Li,Han Yang,Limin Jia,</i>	
124_Final	Machinery fault diagnosis based on weighted 2D fault feature extraction and multi-level information fusion	296
	<i>Ziao Luo,Zuqiang Su,Feng Tan,Ruixing Hu,Xiaolin Hu Hu,Bin Xing</i>	

129_Final	Iterative Dictionary Learning Based on Nonconvex Sparse Regularization and Adaptive Parameter Control	303
	<i>Mingqiao Deng,Yongfang Mao ,Yi Chai ,Xin Chen</i>	
133_Final	Probability forecasting of Lithium-ion batteries remaining useful life by using the additive quantile regression model with splines	309
	<i>Qingrong Zou</i>	
134_Final	A novel piezoelectric resonator for liquid density and viscosity measurement	313
	<i>Linya Huang,Libo Zhao,Renjie Tan,Dejiang Lu,Ping Yang,Zhuangde Jiang</i>	
135_Final	Shielding Effectiveness Simulation of Rectangular Enclosures Using FIT	317
	<i>Yihe Zhao,Libo Zhao,Mimi Huang,Zhikang Li,Ping Yang,Jie Li,Zichen Liu,Zixuan Li,Tingzhong Xu,Dejiang Lu,Zhuangde Jiang</i>	
136_Final	Perceiving Driving Hazards in a Data-Fusion way Using Multi-Modal Net and Semantic Driving Trajectory	322
	<i>Zhen Gao,MingFeng Ou,Yajun Liu,Jiang Yu Zheng</i>	
138_Final	Demodulation Analysis Based on Fourier Decomposition Method and Its Application for Gearbox Fault Diagnosis	329
	<i>Dong Zhang,Yanyan Liu,Zhipeng Feng</i>	
139_Final	A Machine Learning Based Method for Short-term Urban Rail Transit Passenger Flow Prediction	335
	<i>Yanjun Huang,Haiying Li,Xi Jiang,Qi Sun,Chengcheng Su</i>	
140_Final	Map matching based on trajectory route feature	340
	<i>Zhouhao Wu,Yuanqing Wang</i>	
141_Final	Structural Health Monitoring System and Experiment Study of Aircraft Tapered Pipeline Structure	347
	<i>Shuai Ren,Guoqing Pan,Hongwei Ma,Weigang Hu,Yong Liu,Hongzheng Fang,Jian Sun</i>	
142_Final	A Diagnostic and Health Management System for Rolling Bearing in Axle Box of Bogie	353
	<i>Shuai Ren,Hongwei Ma,Guoqing Pan,Xiaoqiong He,Hongzheng Fang,Jianrong Wei,Pu Zou,Jian Sun</i>	
143_Final	Research on Intrusion Detection Method of Key Metro Areas Based on YOLOv3	357
	<i>Meijie Li,Zhengyu Xie,Yong Qin,Yingqing Mai,</i>	

144_Final	Anti-crosstalk Piezoresistive Flexible Three-dimensional Force Sensor for Dexterous Robot Hand	361
	<i>Song Wang,Chenyong Wang,Qijing Lin,Bian Tian,Niancai Peng,Weixuan Jing,Ping Yang,Zhongnan Niu,Zhuangde Jiang</i>	
145_Final	An Object Segmentation Method for Railway Surrounding Environment Based on Three-dimensional Point Cloud	366
	<i>Qixian Li,Yong Qin,Ping Chen,Zhipeng Wang,Xianbin Cao</i>	
146_Final	Health State Prediction of Rolling Element Bearing Using Phase Space Reconstruction and Improved GMDH	371
	<i>Zhe Li,Ge Xin,Yong Qin</i>	
148_Final	A Brief Discussion on the Maintenance Decision Support Method of Coastal Defense Equipment	N/A
	<i>Shang Xiong,Shan Jiang</i>	
149_Final	The Research on Electro-hydraulic Servo Sliding Mode Control Based on Differential Evolution	380
	<i>Changyong Cao,Hua Lin,Xiaochao Zhou,Qiong Liu</i>	
153_Final	Railway Train Device Fault Causality Model Based on Knowledge Graph	385
	<i>Yu Zeng,Yong Qin,Dian Liu,Yong Fu,Ming Gong,Xinning Zhang</i>	
154_Final	EfficientSSD: A Real-Time Intrusion Object Detection Algorithm for Railway Surveillance	391
	<i>Yongling Li,Yong Qin,Zhengyu Xie,Zhiwei Cao,Limin Jia,Zujun Yu,Jian Zheng,Ehui Zhang</i>	
160_Final	Research on Energy Consumption and Environmental Parameters Evaluation of Nearly Zero Energy Building Based on LoRa IOT	396
	<i>Qingguang Yu,Yuming Liu,Zhicheng Jiang,Gaoxiang Long</i>	
161_Final	Research on train operation adjustment in emergencies	402
	<i>Zhiwen Liao,Yong Qin,Mingming Wang,Qizhi Tang,Qi Zhang</i>	
162_Final	An Engine Oil Analysis Method Based on Kernel Density Estimation And Three-lines Values Method	409
	<i>Zhencong Lu,Yong Qin,Ge Xin,Yuze Wang,Shunjie Zhang,Xiaoqing Cheng,Xiaojian Yi</i>	