# **2021 International Conference** on Electronic Communications, **Internet of Things and Big Data** (ICEIB 2021)

Yilan County, Taiwan **10-12 December 2021** 



IEEE Catalog Number: CFP21AY6-POD **ISBN:** 

978-1-6654-3756-1

#### **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:	CFP21AY6-POD
ISBN (Print-On-Demand):	978-1-6654-3756-1
ISBN (Online):	978-1-6654-3755-4

#### 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 Content**

• Editorial	II
• Table of Content	III

#### • <u>Aerospace</u>

Micro Aerial Vehicle Transmission of Flight Dynamics Telemetry	1
Edwin M. Lau, Alan Yung-Hung Chiu, Eric Yu-Kai Ye, Paul Wei-Zhi Chen, Hong-Heng Jhang Jian,	
Jackson You-Jie Wu	

UAV Detection Based on Clustering Analysis and Improved Genetic Algorithm	4
Yihan Tang	

### • **Bioengineering**

Specification Development for Millimeter-Wave Absorption-Ba	ased Non-Invasive
Glucose System	10
Zhong-Da Wu, Chih-Yu Chang, Hsiao-Chin Chen, Tzu-yu Lin	

# <u>Communication, Networking & Broadcasting</u>

A Model of Predicting Operation Time of Vehicular Ad-Hoc Network Based on Multiple Indexes 13

Shitong Ye

Deep Reinforcement-Learning Based Power and Beamforming Coordination for IoT
Underlying 5G Networks 20
Chiapin Wang, Cheng-Lin Hsieh, Han-Chi Gao
Design of an Internet of Things Network for Temperature and Humidity Monitoring
and Its Implementation Using SSAIL Technology 23
Shathya Duobiene, Karolis Ratautas, Romualdas Trusovas, Gediminas Raciukaitis
Design of Anti-lost Early Warning System based on Bluetooth 28
Hao Dong, Guangyin Zhou, Yinglu Yao, Shaojiao Qu, Chenchen Wang, Yinfang Xu, Huiyingxin Guo, Zhanxiu Cai
<b>Development of Multi-user Synchronous VR System and its Performance Analysis</b> 33 Juin-Ling Tseng
Dynamic Interval Strategy for MT6D in IoT Systems36Yen-Yu Chen, I-Hsien Liu, Chi-Che Wu, Chuan-Gang Liu, Jung-Shian Li
Investigating the Situational Awareness with Optical See-Through Augmented Reality
in IoTBased Environments 40
Ning Miao, Xun Peng, Xintong Chen, Gang Ren, Gang Wang
IoT Applications in Smart Cities44
Mohammad Ilyas
Joint AOA and TOF Estimation for Multipath OFDM Signals Based on MSCNN 48
Wanda Song, Youyun Xu, Li Wei
Network Intrusion Detection System with Stream Machine Learning in Fog Layer and
Online Labeling in Cloud Layer53
Shih-Hsien Chuang, Ren-Chieh Yang, Sheng-De Wang
Performance Evaluation and Improvement of a Cloud-Native Data Analysis System
Application 60

Chia-Chuan Chuang, Yu-Chin Tsai

QoE-aware Efficient Resource Allocation in Cloud Radio Access Network63Chao He, Nina Dai, Chih-Cheng Chen
Research on Hospital Number Arrangement and Calling System Based on Multi- machine Communication67Tsai Shangte, Yuan Shufang, Yu Lipeng, Xiao Siyi
Research on Strategy and Technology of Creating Smart City in Yilan with IoT         Technology         71         Yu-Heng Huang, Chang-Wei Chai, Li-Guang Chen, Dung-Ming Wu, Tseng-Wei Chao, Yen-Hung Chen
Research on the Dynamic Firewall of the Internet of Things78Tsai Shangte, Yuan Shufang, Luo Shijian, Zhang Xihui
Wireless Sensor Network Routing Algorithm based on Traffic Prediction for Internet of Thing Baoying Wang

# • Components, Circuits, Devices & Systems

Beehive with	h Low-energy of High-voltage Shock Against Killer Hornets	87
Kuo-Tai Hsu, Ch	iien-Hao Chen, Zhi-Hua Chen, Sheng-Shen Hong, Chih-Tsing Wang, Wen-Ping Chen	
Calculation	Method of Loop Resistance Based on Maximum Temperature of Electr	ical
Equipment		92
Dewen Zhang, N	lan Cai, Haifeng Li, Wenshuai Yang, Xiangyu Zhao, Shuaihui Qiu, Zhenpeng Wang	
Design and	Implementation of AC-DC Converter Integrated with TNY278	96
Guodong Hu, Ha	aiqing Chang, Zeyu Li, Pu Tian	
Developmer	nt of an Electricity Loop Current Monitor System Based on MQTT Bro	oker
		101

Yung-Chung Tsao, Yaw-Wen Kuo, Chia-Chun Wu, Yin-Te Tsai, Chih-Cheng Hsu

2021 IEEE International Conference on Electronic Communications, Internet of Things and Big Data
Development of Mountable Infrared-Thermal Image Detector for Safety Hamlet105Kuo-Tai Hsu, Bo-Sheng Wang, Chien-Hung Lin, Bo-Yen Wang, Wen-Ping Chen
Digital Timing Skew Compensation Ciucuit with Adaptive Duty-Cycle Signals110Yu-Shan Liang, You-Gang Chen, Teresa Bei-Yi Shen
Investigation on CMOS On-Chip Inductors Using Various Patterned Ground/FloatingShield Techniques113Jhen-Nong Wu, Yan-Ming Chang, Zih-Yao Shen, Hsiao-Chin Chen
Nine-axis Posture Sensor-based Fall Detection and Alarm System117Yanzhe Zhao, Shuwen Liu, Shukai Tang
Novel Voltage Distortion Measurement Method Using a Contactless Electric-FieldSensor Array120Kun-Long Chen, Chi-Qi Chang
Research on Correction of Infrared Diagnostic Criteria for High-temperature ElectricalEquipment under Extreme Cold Conditions124Dewen Zhang, Hao Yu, Shuaihui Qiu, Xiaoxu Hu, Zhen Zhang, Zhenpeng Wang, Wenshuai Yang
Testing Of Quality Of Water Using SVM128Hansen F Charlie, Gloreine Dela Cruz
• <u>Computing &amp; Processing (Hardware/ Software)</u>

Analysis and Path Optimization of Chronic Disease Health Management Based	on
PEST Method	131

Liuyan Hu, Xinyan Gan, Feiqi Li

# Analysis of Influencing Factors in Commercial Forest Redemption Based on LR-BP Neural Network 134

Ziyan Wang, Yuanzhu Wei

Analysis of Paint Messages with Multiple C++/CLI Controls138Gao-Wei Chang138

Analysis on Quality Evaluation of Animation Majors' Works from Perspective of DANP model 142

Dong Yang, Yan Fang Huang, Xin Zhao

Architecture and Building the Medical Image Anonymization Service: Cloud, Big Data and Automation 149 Wei-Yu Chen, Mulder Yu, Ceasar Sun

Auxiliary System for Road Inspection Based on Geotagged Videos and Map Services154 Chi-Chih Chuang, En-Wei Chang, Yu-Jung Chang, Shen-Hung Wong, Kuo-Feng Ssu

Comprehensive Comparison of Post-Quantum Digital Signature Schemes in Blockchain	
158	
Pakhtiyar Vakubar Lu Can	

Bakhtiyor Yokubov, Lu Gan

Construction of Work Quality Evaluation System and Evaluation Model for Students	
Majoring in Visual Animation	162
Dong Yang, Qi-Mu Chen, Bao-Feng Wang	
Data Enhancement Technology Based on I-GOS Algorithm	167
Fei Li, Xiaotong Deng, Feifei Shi, Xiaoxue Zhou, Kaijun Xia, Guangdi Hu	
Evaluation of Digitization Loval of agricultural Machinery Pasad on C	way Naural

Evaluation of Digitization Level of agricultura	Machinery Based on Grey Neural
Network	171
Nan Feng, Zhiguo Chen, Tingting Song	

Illegal Parking Detection System Based on Scooters' Trajectories	175
Yun-Chen Hsieh, Yu-Jung Chang, Kuo-Feng Ssu	

Impact of Host Country Heterogeneity: Empirical Research Based on data mining and PSM-DID Model 179

Pengfei Shao, Lei Yao

2021 IEEE International Conference on Electronic Communications, Internet of Things and Big Data

Improved Transform Algorithm of Direct Computation of Discrete Cosine for Mel-scaleFrequency Cepstral Coefficient185Shin-Chi Lai, Ying-Hsiu Hung, Yi-Chang Zhu, Szu-Ting Wang, Ming-Hwa Sheu, Wen-Ho Juang
Multi-class Object Detection in Fusion Remote Sensing Images Based on Deep Learning 188
Tao Sun, Kun Liu
<b>Overview of Intelligent Fault Diagnosis based on Machine Learning</b> 193 <i>Jun Guo, Kaixu Han</i>
Overview of Multi-Exposure Image Fusion196Yanfeng Li, Mingyang Liu, Kaixu Han
Patrolling Automated Guided Vehicle Enhanced with Object and Face Recognition         Functions       199         Chin-Chih Chang, Hao-Ren Wang
Programming Models of Command Processing for Time-Series Data with Fault Tolerance to C++/CLI Graphics Codes 204 Gao-Wei Chang
Promotion Strategy of Reduce Fare-dodging Based on System Dynamics from the Perspective on Evolutionary Game208Junli Tang, Xiaozhou He, Zhen Wang, Siyu Zeng
Proof of Authenticity of Logistics Information with Passive RFID Tags and Blockchain 213
Hiroshi Watanabe, Kenji Saito, Satoshi Miyazaki, Toshiharu Okada, Hiroyuki Fukuyama, Tsuneo Kato, Katsuo Taniguchi
Real-time Path Planning Algorithm for Scooters in Urban Traffic Environments with the         Hook-Turn Constraint       217         Dai-Yan Xu, Yu-Jung Chang, Kuo-Feng Ssu

Real-Time Retail Product Detection with New Augmentation Features221Chih-Hsien Hsia, William Chang, Chun-Yen Chiang, Hung-Tse Chan221

# Recognition and Alarm System with Deep Learning for Correctly Wearing a Face Mask 224

Bo-Kai Liao, Chia-Chi Lu, Rong-Jian Chen

Research Hotspots in Application of Data Mining Technology in Traditional ChineseMedicine-Visual Analysis of Knowledge Graph based on CNKI227

Anying Xu, Xiang Gao, Chunfang Zhou, Yingying Li, Lirong Chen, Xinyan Gan

Research on Classification and Popularization of Folk Drama Based on data mining and SVM 230

Guoling Cui

Research on Construction of Mining Model of Association Rules for Temporal Databased on CNN233Xinyan Gan, Daoqing Gong, Xiang Gao, Yunfang Zhang, Liuyun Lin, Tianying Lan

Research on Household Financial Assets Risk Based on Monte Carlo Method to Solve VaR Model 236 Suiuan Han

Sujuan Han

 Research on Image Classification of Chinese Medicine Based on Improved Deep

 Learning Technology
 239

 Descine Core View Core View Core View Medicine Date

Daoqing Gong, Xinyan Gan, Xiang Gao, Yanni Ma, Jinchun Huang, Chuyan Deng

Research on Innovation Efficiency in Guangdong Province Based on Malmquist and<br/>Entropy-grey Relational Evaluation Model244Zhiyong Huang, Qiongdi Chen, Hanzhan Li244

Research on Science Popularization Management of Community Sports Facilities Basedon Artificial Inelligence Decision Tree Network249Qian Xu, Jingjing Ji249

<b>Research on System Design of Tank Role in MOBA Games</b> LuoXuan Zhou, Jun He, WenYuan Hao	252
Research Status and Frontier Trend of Regional Innovation Capability in C CiteSpace Visualization Analysis Based on Big Data Analysis Method Xiaofeng Wang, Jianghuai Feng, Ting Li	China 256
Selection of Environmental Regulation Tools with Technological Innovation Incentive	
<b>Based on Comprehensive FGLS Estimation Method</b> Sujuan Han, Zhaoyang Wu	261
Simple Online Real-Time Tracking Algorithm with Improved YOLOV4 as Extrac Fei Li, Xiaotong Deng, Feifei Shi, Xiaoxue Zhou, Kaijun Xia, Guangdi Hu	tor 266:
Strengthen the Learning Ability of College Students in AI Game Design using Based Learning Juin-Ling Tseng	Project- 271
Study of Deep Learning in Video Object Track Shufang Yuan, Kaixu Han, Xueling Zou	274
Survey of Pre-trained Models for Natural Language Processing Jiajia Peng, Kaixu Han	277
<b>Theory and Practice: Eight Steps to Build Big Data Services</b> Manhai Li, Hongyan Zhao, Zhiqing Zhou, Ying Tao, Kuo-Hsun Wen	281

# • Fields, Waves & Electromagnetics

Multi band Antenna for Notebook Computer Device	285
Wei Chien, Shangte Tsai	

## • General Topics for Engineers (Math, Science & Engineering)

Application of Regression Model on Correlation between Physical Self-concept andSports Events289Yan Li, Lingshu Li281

# Exact Calculation of Social Distancing at Ongoing COVID-19 Pandemic by UsingSimple Kinematics of Aerosols294Huber Nieto-Chaupis294

Pandemic of Covid-19 as Global Entropy: When Shannon Theory fits To-Date Data of<br/>New Infections298Huber Nieto-Chaupis298

Research on Prediction of Public Health Emergencies by Transmission Dynamics Model 302

Xiaoxuan Mei, Dan Chen, Xiao Cheng

Review of Deep Learning-based Style Transfer Research	307

Zhiyuan He, Kaixu Han, Yufei Li

#### • Photonics & Electro-Optics

Spectrophotometry and Spectroscopy for Sensing Discharge Water Parameters from aTannery in Cotopaxi, Ecuador310Ricardo Urrutia-Goyes, Karen Jara, Paulina Mena, Marco Fiallos

#### • Power, Energy, & Industry Applications

Application of Mobile Energy Storage System in Micro-Grid Management System314Wen-Chi Kuo, Chiun-Hsun Chen, Chi-Chuan Wang, Yang-Chuang Chang314

Distributed Wind Power and Photovoltaic Energy Storage Capacity Configuration	
0	18
Jinghui Song, Chunchao Hu, Leitao Su	
Self-supervised Adversarial Network for Intelligent Fault Diagnosis3	23
Minqiang Deng, Aidong Deng, Yaowei Shi	
• <u>Signal Processing &amp; Analysis</u>	
Signal Hocessing & Analysis	
	27
Zhen-Hao Su, Jui-Cheng Yen	
Research on an Improved Driver-response Chaotic Synchronization Voice Encryptic	on
Technology 3	30
Chong Zhao, Ning Wang, Min Ji	
Study for Fault Detection Method of Multiple Vehicular Positioning System 3	35
You-Sian Lin, Chih-Neng Liang, Ji-Fan Yang	
Waveform Analysis of Impulse Response in Dynamic Interrelationships and Spati	ial
Heterogeneity 3	39
Jui-Jung Tsai, Yang-Chao Wang, Jialu Fang, Yiying Huang	

# • Author Index

345