

# 2021 IEEE International Conference on Progress in Informatics and Computing

## PROGRAM GUIDE



December 17-19, 2021, Online

<http://www.picconf.com>

# TECHNICAL PROGRAM

## Dec 17

<b>PIC 2021 Pre-conference Tutorial Talk</b>	
15:30 -17:00	<b>Online Tutorial, Chair Dr. Bo Huang</b> <b>“ Principles and Practice of Neural Machine Translation”</b> <b>Assistant Prof. Yun Chen</b> <b>(Room A)</b>
17:00 -	<b>Supper</b>

## Dec 18

8:00 - 9:00	<b>Breakfast</b>
9:00 - 9:20	<b>PIC 2021 Welcome</b> <i>Chairs: Prof. Hamido Fujita, Prof. Yinglin Wang, Prof. Jyrki Nummenmaa</i> <i>Prof. Zheyang Zhang</i> <b>(Room B1)</b>
9:20 - 10:20	<b>Online Keynote Speech(1), Chair: Prof. Xing Wu</b> <b>“Fuzzy Transfer Learning”</b> <b>Prof. Jie Lu</b> <b>(Room B1)</b>
10:20 - 10:50	<b>TEA BREAK</b>
	<b>Session1 Machine Learning Theory &amp; Methods</b>
	<b>#01-007, #06-032, #07-050, #10-079</b> <b>(Room B1)</b> <b>Chair: Yufeng Liu</b>
	<i>(#007) “An Enhancement to Graph Grammar for the Specification of Edge Semantics”</i> <i>Yufeng Liu and Fan Yang</i>
10:50 - 11:50	<i>(#032) “Research of Imbalanced Classification Based on Cascade Forest”</i> <i>Minghua Shi, Fangxin Lin, Ying Qian and Liang Dou</i>
	<i>(#050) “Wide Residual Lightweight Network Using Simplified Adaptive Parameter Rectifying Units”</i> <i>Yufeng Ling, Jian Lu, Jian Dong, Tianjian Li and Zhiming Cai</i>
	<i>(#079) “Research on Hierarchical Clustering Undersampling and Random Forest Fusion Classification Method”</i> <i>Junqing Li, Huimin Wang, Changqing Song, Ruiyi Han and Taiyuan Hu</i>
	<b>Session2: Decision Making &amp; Optimization</b>
	<b>#49-030, #50-092, #51-142, #52-113</b> <b>(Room B2)</b> <b>Chair: Jingsong Zhang</b>
10:50 - 11:50	<i>(#030) “A Hybrid Whale Optimization and Particle Swarm Optimization Algorithm”</i> <i>Zijing Yuan, Jiayi Li, Haichuan Yang and Baohang Zhang</i>
	<i>(#092) “Improved Arithmetic Optimization Algorithm via Opposition-based Learning Strategy”</i> <i>Lin Xia, Haomiao Li and Jiang Xin</i>

	<p>(#142) “Optimal scale combinations selection for incomplete generalized multi-scale decision systems” <i>Mou Qiong and Cheng Yunlong</i></p> <p>(#113) “Lion Swarm Optimization Based on Balanced Local and Global Search with Different Distributions” <i>Keqin Jiang and Mingyan Jiang</i></p>
<b>10:50-11:50</b>	<b>Session3: Big Data Computing</b>
	<b>#55-010, #56-011, #57-051, #58-072 (Room B3)</b> <i>Chair: Jianmei Guo</i>
	<p>(#010) “Dijkstra Algorithm based Building Evacuation Edge Computing and IoT System Design and Implementation” <i>Yanping Ji, Wensi Wang, Wangxin Chen, Liting Zhang, Mengyu Yang and Xiaowen Wang</i></p> <p>(#011) “A Comparison of Wearable Sensor Configuration Methods for Human Activity Recognition using CNN” <i>Lina Tong, Qianzhi Lin, Chuanlei Qin and Liang Peng</i></p> <p>(#051) “Machine learning Framework for Detecting offensive Swahili Message in Social Networks with Apache Spark Implementation” <i>Francis Jonathan, Dong Yang, Glyn Gowing and Songjie Wei</i></p> <p>(#072) “Enhanced Particle Swarm Optimization for Workflow Scheduling in Clouds” <i>Chang Lu, Jie Zhu and Haiping Huang</i></p>

<b>13:30-15:00</b>	<b>Session4 Machine Learning Theory &amp; Methods</b>
	<b>#03-016, #04-017, #08-065, #11-086 (Room B1)</b> <i>Chair: Norikazu Takahashi</i>
	<p>(#016) “Evolving Dendritic Neuron Model by Equilibrium Optimizer Algorithm” <i>Chunzhi Hou, Jiarui Shi and Baohang Zhang</i></p> <p>(#017) “Using Sparrow Search Hunting Mechanism to Improve Water Wave Algorithm” <i>Haotian Li, Baohang Zhang, Jiayi Li, Tao Zheng and Haichuan Yang</i></p> <p>(#065) “Distributed HALS Algorithm for NMF based on Simple Average Consensus Algorithm” <i>Keiju Hayashi, Tsuyoshi Migita and Norikazu Takahashi</i></p> <p>(#086) “Single Dendritic Neural Classification with Functional Weight-enhanced Differential Evolution” <i>Ziqian Wang, Kaiyu Wang, Jiaru Yang and Zheng Tang</i></p>
	<b>Session5 Image Recognition &amp; Computer Vision</b>
	<b>#15-021, #16-026, #17-033, #18-059, #20-087, #21-110 (Room B2)</b> <i>Chair: Xin Xu</i>
	<p>(#021) “A YOLOv3 and ODIN Based State Detection Method for High-speed Railway Catenary Dropper” <i>Man Zhang, Weidong Jin, Peng Tang and Liang Li</i></p> <p>(#026) “A medical reagent grade judgment system based on color intelligent recognition” <i>Run Chai, Junchao Wan and Huaping Zhu</i></p> <p>(#033) “Dual Attention Based Uncertainty-aware Mean Teacher Model for Semi-supervised Cardiac Image Segmentation” <i>An Xu, Shaoyu Wang, Jingyi Fan, Xiujin Shi and Qiang Chen</i></p> <p>(#059) “Research on Knowledge Distillation Algorithm of Object Detection” <i>Liu Peishun, Xuefang Wang, Yuchun Chu and Zhang Wenbin</i></p> <p>(#087) “DA-STD: Deformable Attention-Based Scene Text Detection in Arbitrary Shape” <i>Xing Wu, Yangyang Qi, Bin Tang and Hairan Liu</i></p> <p>(#110) “Multi-Level Drowsiness Detection Based on Deep Feature Fusion of Eye and Head Pose” <i>Fang Ye, Li Shunxin, Xin Yuan and Longfei Li</i></p>

	<b>Session6 Intelligent systems &amp; Miscellaneous applications</b>
	<b>#77-029, #78-114, #79-031, #82-037, #90-108, #92-107 (Room B3)</b> <i>Chair: Zaipeng Xie</i>
<b>13:30-15:00</b>	(#029) “An efficient seizure prediction method based on multi-scale feature fusion with reduced channels” <i>Shunxian Gu and Xinning Song</i>
	(#114) “Integrated Learning Model Based on GC-Stacking for Early Prediction of Diabetes Mellitus” <i>Xiaoxia Li, Jianjun Zhang, Peishun Liu, Ruichun Tang, Qing Guo and Qinshuo Wang</i>
	(#031) “An efficient deep learning framework of COVID-19 CT scans using contrastive learning and ensemble strategy” <i>Shenghan Zhang, Binyi Zou, Binqun Xu, Jionglong Su and Huafeng Hu</i>
	(#037) “A Multi-Sensory Blind Guidance System Based on YOLO and ORB-SLAM” <i>Chufan Rui, Yichen Liu, Junru Shen, Zhaobin Li and Zaipeng Xie</i>
	(#108) “Research on Automatic Navigation for a Bipedal Humanoid Robot” <i>Bin Zhang, Junjie Moh and Hun-Ok Lim</i>
	(#107) “Development of a 1-DOF Elbow Power Assisting System Based on Mechanomyogram Signals” <i>Bin Zhang, Kenji Isobe and Hun-Ok Lim</i>
<b>15:40-16:40</b>	<b>Online Keynote Speech(2), Chair: Prof. Zheyang Zhang</b> “ Adversarial Attacks and Defenses for Multi-view Learning ” <b>Prof. Shiliang Sun</b> <b>(Room B1)</b>
	<b>Session7: Image Recognition &amp; Computer Vision</b>
	<b>#19-082, #22-144, #23-119, #24-078 (Room B1)</b> <i>Chair: Chen Lyu</i>
<b>16:40-17:40</b>	(#082) “Computer Vision for Astronomical Image Analysis” <i>Sotiria Karypidou, Ilias Georgousis and George A. Papakostas</i>
	(#144) “Image Stitching Algorithm Based On Region Division For Underwater Dam Crack Image” <i>Yuanbo Huang, Zhuo Zhang and Xiaolong Xu</i>
	(#119) “Image Semantic Segmentation based on the GAN Auxiliary Network” <i>Jinshuo Zhang, Zhicheng Wang, Songyan Zhang, Gang Wei, Zhiqiang Xiong and Meng Yang</i>
	(#078) “Classification of Masonry Bricks using Convolutional Neural Networks – a Case Study in a University-Industry Collaboration Project” <i>Mika Iitti, Jere Grönman, Jari Turunen and Tarmo Lipping</i>
	<b>Session8:</b> <b>Natural Language Processing &amp; Knowledge Management</b>
	<b>#37-095, #39-088, #41-143, #42-154, #43-064, #44-058 (Room B2)</b> <i>Chair: Peng Li</i>
<b>16:40-18:10</b>	(#095) “WebRank: Language-independent extraction of keywords from webpages” <i>Himat Shah, Radu Marinescu-Istodor and Pasi Fränti</i>
	(#088) “Research on An Two-Channel ACNN-LSTM Model for Financial Text Sentiment Analysis” <i>Hanxiao Shi, Liqiang You, Mimi Ren and Xiaojun Li</i>
	(#143) “Real-Time Kafka-based Topic Modeling and Identification of Tweets” <i>George Manias, Argyro Mavrogiorgou, Athanasios Kiourtis, Dimosthenis Kyriazis and Dimitris Kakomitas</i>
	(#064) “Towards Engineering Fair Ontologies: Unbiasing a Surveillance Ontology” <i>Evangelos Papatidis and Konstantinos Kotis</i>
	(#058) “Multi-Round Recommendations for Stable Groups” <i>Ilmo Heiska and Kostas Stefanidis</i>
	(#154) “A Survey on the Identification of Causal Relation in Texts” <i>Mingyue Han and Yinglin Wang</i>

	<b>Session9: Intelligent systems &amp; Miscellaneous applications</b>
	<b>#76-027, #80-132, #81-056, #84-104, #93-034 (Room B3)</b> <i>Chair: Victoria</i>
<b>16:40-17:55</b>	(#027) “Unsupervised Deep Variational Model for Multivariate Sensors Anomaly Detection” <i>Mulugeta Weldezigina Asres, Grace Cummings, Pavel Parygin, Aleko Khukhunaishvili, Maria Toms, Alan Campbell, Seth I. Cooper, David Yu, Jay Dittmann and Christian W. Omlin</i>
	(#132) “Recognition of Usual Similar Activities of Dementia Patients via Smartwatches Using Supervised Learning” <i>Sergio Staab, Johannes Luderschmidt and Ludger Martin</i>
	(#056) “An Optimized Algorithm for Indoor Localization and Concepts for Anonymous Dynamic Obstacle” <i>Nizam Kuxdorf-Alkirata and Dieter Brückmann</i>
	(#104) “Weighted dependence of the day of the week in patients with emotional disorders. A mathematical model” <i>Pavél Llamocca, Victoria Lopez and Matilde Santos</i>
	(#034) “Fault Detection on Bearings and Rotating Machines based on Vibration Sensors Data” <i>Thanasis Kotsiopoulos, Thanasis Vafeiadis, Aristeidis Apostolidis, Alexandros Nizamis, Nikolaos Alexopoulos, Dimosthenis Ioannidis, Dimitrios Tzovaras and Panagiotis Sarigiannidis</i>
<b>18:10 -19:00</b>	<b>Supper</b>
<b>19:00 - 19:30</b>	<b>Awards Session</b> <i>Chairs: Prof. Hamido Fujita, Prof. Yinglin Wang, Prof. Zheyang Zhang</i> <b>(Room B2)</b>
	<b>Session10: Software Engineering &amp; Service Computing</b>
	<b>#60-008, #61-020, #62-063, #63-106, #64-122 (Room B2)</b> <i>Chair: Zhichao Lian</i>
<b>20:00-21:15</b>	(#008) “The Similarities of Software Vulnerabilities for Interpreted Programming Languages” <i>Jukka Ruohonen</i>
	(#020) “Research on Mixed Transaction Analytical Data Management Oriented to Data Middle Platform” <i>Ai-Hua Zhou, Li-Peng Zhu, Meng-Han Xu, Sen Pan, Jun-Feng Qiao, Hong-bin Qiu and Song Deng</i>
	(#063) “Reliability Modeling and Analysis of Hospital Information System Based on Microservices” <i>Zheng Liu, Huiqun Yu, Guisheng Fan and Liqiong Chen</i>
	(#106) “Toward More Effective Use of Assertions for Mobile App Development” <i>Yoonsik Cheon</i>
	(#122) “A Bytecode Service Composition Engine for Embedded Services” <i>Siao Wang, Chenglie Du, Jinchao Chen, Zuo Zhao and Ying Zhang</i>

## Dec 19

	<b>Session11: Intelligent systems &amp; Miscellaneous applications</b>
	<b>#83-068, #85-038, #87-089, #88-070, #89-075, #91-147 (Room C1)</b> <i>Chair: Xiao Wang</i>
<b>8:30-10:00</b>	(#068) “An Action Recognition Method based on Radar Signal with Improved GWO-SVM Algorithm” <i>Jian Dong, Li Zhang, Zilong Liu, Zhiwei Lin and Zhiming Cai</i>
	(#038) “Frequency Embedded Regularization Network for Continuous Music Emotion Recognition” <i>Meixian Zhang, Yonghua Zhu, Ning Ge, Yunwen Zhu, Wenjun Zhang and Tianyu Feng</i>

	<p>(#089) “TransCL: Contrastive Learning on complex transportation network” <i>Rui Xue, Huohua Li and Xiaoning Ma</i></p> <p>(#070) “Double-Sided Auction Mechanism for Peer-to-Peer Energy Trading Markets” <i>Jemasharin Pankiraj, Abdulsalam Yassine and Salimur Choudhury</i></p> <p>(#075) “A Job Shop Scheduling Method Based on Ant Colony Algorithm” <i>Junqing Li, Huawei Deng, Dawei Liu, Changqing Song, Ruiyi Han and Taiyuan Hu</i></p> <p>(#147) “Path Planning for an Omnidirectional Mobile Robot Based on Modified A* Algorithm with Energy Model” <i>Cong Liu, Xiaobin Xu, Xinhong Li, Zhijie Pan, Kai Hu and You Shu</i></p>
8:30-10:00	<p><b>Session12: Image Proceeing &amp; Human-Computer Interaction</b></p> <p><b>#30-057, #31-005, #32-024, #33-103, #34-067, #35-040 (Room C2)</b> <b>Chair: Bo Huang</b></p> <p>(#057) “Weighted Best Linear Prediction and its Randomized Acceleration for Poisson Image Denoising” <i>Qing Li and Jun Zhang</i></p> <p>(#005) “Deeply Feature Fused Video Super-resolution Network” <i>Jingmin Yang, Zhensen Chen and Li Xu</i></p> <p>(#024) “Image Texture Removal by Total Variational Rolling Guidance” <i>Wei Wang, Yi Yang and Xin Xu</i></p> <p>(#103) “Adaptive Total Variation Regularized for Hyperspectral Unmixing” <i>Chenguang Xu</i></p> <p>(#067) “Camera Calibration Method Based on Sine Cosine Algorithm” <i>Zihui Feng, Quan Liang, Zicheng Zhang and Wei Ji</i></p> <p>(#040) “The jet closed-loop control method based on image processing” <i>Jian She Liu</i></p>
	<p><b>Session13: Intelligent Network and Information Security</b></p> <p><b>#68-111, #69-128, #70-073, #71-118, #72-101, #73-062 (Room C3)</b> <b>Chair: Zhi Li</b></p> <p>(#111) “Network situation risk assessment Based on vulnerability correlation analysis” <i>Xinmeng Nan, Ruiqi Chen, Hongtao Tian and Yupeng Liu</i></p> <p>(#128) “Design of Integrated Gateway System for Marine Communication” <i>Bin Zeng, Rui Wang and Chunhui Yang</i></p> <p>(#073) “A Differentially Private Data Transmission Scheme for Advanced Metering Infrastructures” <i>Li Yan, Chao Ma, Cong Wang, Ziqing Zhu, Gaozhou Wang and Huijian Wang</i></p> <p>(#118) “An Advanced JPEG Steganalysis Method with Balanced Depth and Width Based on Fractal Residual Network” <i>Rui Zhan, Yi Ma, Shanshan Yang, Yufei Man and Yu Yang</i></p> <p>(#101) “A Lightweight Embedding Probability Estimation Algorithm Based on LBP for Adaptive Steganalysis” <i>Jialin Lin, Yufei Wang, Ming Han, Yu Yang and Min Lei</i></p> <p>(#062) “Cross-Site Scripting (XSS) and SQL injection Attacks Multi-classification Using Bidirectional LSTM Recurrent Neural Network” <i>Abdulghar A. R. Farea, Chengliang Wang, Ebraheem Farea and Abdulfattah Ba Alawi</i></p>
	<p><b>10:00 -10:30 TEA BREAK</b></p>
	<p><b>Session14: Intelligent systems &amp; Miscellaneous applications</b></p> <p><b>#86-131, #94-096, #95-003, #96-152, #97-090 (Room C1)</b> <b>Chair: Weihui Dai</b></p> <p>(#131) “Olfactory Affective Computation Based on EEG Signal Data” <i>Weihui Dai, Xinyue Li, Ziqing Xia, Jintian Zhou, Lijuan Song, Huajuan Mao and Yan Kang</i></p> <p>(#096) “A kNN based Voyage's Containers' Incoming Time Distribution Prediction System” <i>Shitong Shen, Jian Cao, Yinyue Yang and Yameng Guo</i></p>

	(#003) “Data-driven product design and Axiomatic design” <i>Bin Yang, Ren-bin Xiao</i>
	(#152) “Research on Wind Turbine Power Prediction based on model Fusion” <i>Xiuxia Zhang, Jian Hao and Shuyi Wei</i>
	(#090) “A Computer-Aided Recognition Method of Heart Rate Deflection Point” <i>Shenglan Wang, Junhui Li, Mingying Lan, Li Gao and Xiaolin Gao</i>
<b>10:30-11:45</b>	<b>Session15: Information Systems &amp; Evaluation</b>
	<b>#98-039, #99-116, #100-091, #101-120</b> (Room C2) <b>Chair: Jing Zhao</b>
	(#039) “Research on Stratospheric Communication Effectiveness Evaluation” <i>Yubing Men and Jianyun Zheng</i>
	(#116) “Evaluating the usability of a social storefront business model for Ecuadorian Millennials and Centennials” <i>Félix Fernández-Peña, Fernando Ibarra-Torres, Pilar Urrutia-Urrutia and Diana Coello-Fiallos</i>
	(#091) “Research of SPOC Online Learning Behavior Analysis Based on RFT” <i>Hongxia Wang</i>
	(#120) “Identifying Key Features in Student Grade Prediction” <i>Jiaqi Cui, Zhang Yupei, Rui An, Yue Yun, Huan Dai and Xuequn Shang</i>

<b>13:30 -14:30</b>	<b>Online Keynote Speech(3), Chair: Prof. Bo Huang</b> “ Empowering Cognitive Security Systems with Cyber Situation Awareness ” <b>Prof. Vincenzo Loia</b> (Room C1)
<b>14:30 -15:00</b>	<b>TEA BREAK</b>
<b>15:00-16:00</b>	<b>Session16: Natural Language Processing &amp; Knowledge Management</b>
	<b>#38-018, #40-141, #45-130, #46-053, #47-097</b> (Room C1) <b>Chair: Peng Li</b>
	(#018) “Text stance detection based on deep learning” <i>Xu Zhang, Chunyang Liu, Zhongqin Gao and Yue Jiang</i>
	(#141) “Exploring Multi-Layer Convolutional Neural Networks for Railway Safety Text Classification” <i>Taocun Yang, Xin Liu, Guohua Li, Mingrui Dai, Lei Tian and Yanlin Xie</i>
	(#130) “CA-NCF: A Category Assisted Neural Collaborative Filtering Approach for Personalized Recommendation” <i>Yimin Peng, Rong Hu and Yipin Wen</i>
	(#053) “Recommendation Method of Individually Suitable and Attractive Destination for Tourists by Using Profile Data” <i>Li Minghao and Sasaki Jun</i>
	(#097) “The Construction of Learning Diagnosis and Resources Recommendation System Based on Knowledge Graph” <i>Kaiyu Dai, Yiyang Qiu and Rui Zhang</i>
<b>15:00-16:00</b>	<b>Session17: Machine Learning Theory &amp; Methods</b>
	<b>#09-074, #02-015, #05-022, #12-035</b> (Room C2) <b>Chair: Jingsong Zhang</b>
	(#074) “Twin Delayed Multi-Agent Deep Deterministic Policy Gradient” <i>Mengying Zhan, Jinchao Chen, Chenglie Du and Yuxin Duan</i>
	(#015) “Improving Neural Network Architecture Compression by Multi-Grain Pruning” <i>Kevin Kollek, Miguel Angel Aguilar, Marco Braun and Anton Kummert</i>
	(#022) “Random Noise Boxes: Data Augmentation for Spectrograms” <i>Maxime Goubeaud, Nicolla Gmyrek, Farzin Ghorban, Lucas Schelkes and Anton Kummert</i>
(#035) “Generation of Virtual Test Scenarios for Training and Validation of AI-based	

	Systems” <i>Ulrich Dahmen, Tobias Osterloh and Jürgen Roßmann</i>
<b>15:00-16:00</b>	<b>Session18: Image Recognition &amp; Computer Vision</b>
	<b>#25-121, #26-077, #27-081, #28-102</b> (Room C3) <i>Chair: Yuhui Zheng</i>
	(#121) “Human Action Recognition Based On STDMI-HOG and STjoint feature” <i>Qianhan Wu, Qian Huang and Xing Li</i>
	(#077) “Domain Adaptive Visual Tracking with Multi-scale Feature Fusion” <i>Qianqian Yu, Yiyang Wang, Keqi Fan and Yuhui Zheng</i>
	(#081) “Application of Improved YOLOV4 in Intelligent Driving Scenarios” <i>Zicheng Zhang, Quan Liang, Zhihui Feng and Wei Ji</i>
	(#102) “Single Image based Depth Estimation for Maritime Surface Targets” <i>Jishan Sun, Yaojie Chen and Wei Wang</i>
<b>16:15-16:30</b>	<b>Closing Ceremony</b> (Room C1)