

2023 IEEE 4th International Conference on Pattern Recognition and Machine Learning (PRML 2023)

**Urumqi, China
4-6 August 2023**



**IEEE Catalog Number: CFP23AJ9-POD
ISBN: 979-8-3503-2431-0**

**Copyright © 2023 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:	CFP23AJ9-POD
ISBN (Print-On-Demand):	979-8-3503-2431-0
ISBN (Online):	979-8-3503-2430-3

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

2023 IEEE the 4th International Conference on Pattern Recognition and Machine Learning

PRML 2023

Table of Contents

Preface	ix
Committees	x
<hr/>	
➤ Target Detection	
FMDet: Face Mask Detection Based on Improved Cascade RCNN	1
<i>Ruyi Cao, Wanghao Mo, Wendong Zhang</i>	
PoLaNet: Head Pose Estimation and Face Landmarks Detection Network	7
<i>Yunfeng Duo, Xiong Zhao</i>	
YOLO-Q: Drone Aerial Target Detection	13
<i>He Xiao, Xiaomei Xie, Kai Zhao, Peilong Song, Wenbiao Xie, Chen Zou</i>	
BEVTransFusion: LiDAR-Camera Fusion under Bird’s-Eye-View for 3D Object Detection with Transformers.....	21
<i>Kaiqi Feng, Yu Zhang</i>	
Detection of Abnormality in Cognitive Test Scores Using Metric Learning.....	29
<i>Song Wang, Dania Maryam Waqar, Mengyao Hu, Richard Gonzalez, Yi Lu Murphey</i>	
Few Shot Object Detection Based on Graph Attention Network.....	37
<i>Rou Ding, Yu Zhang</i>	
BnSepCNN: Convolutional Neural Network for P300 Detection	44
<i>Maohua Liu, Fred R. Beyette Jr.</i>	
Fault Diagnosis and Region Detection of CCD Image in Double Delay Three-Step Autocorrelator.....	51
<i>Suicheng Li, Zizhou He, Wenwen Shen, Yanwen Xia, Zhigao Ni, Xiaowei Zhou</i>	
End-to-End Residual Stage Network for COVID-19 Detection	56
<i>Hongwei Chen, Zhihua Huang, Kexin Lu, Hanzheng Liu</i>	
Obstacle Detection in Off-road Environments Based on LiDAR.....	61
<i>Arzigul Ahat, Eksan Firkat, Tayir Mijit, Askar Hamdulla</i>	
Visibility Detection Methods in Road Traffic Scene-A Survey	69
<i>Zhou Jun, Mamatjan Tursun</i>	
➤ Pattern Recognition and Intelligent Recognition System Design	
Diagnosis and Identification of Citrus Canker Growth Rate Using Machine Learning.....	75
<i>Naureen Zainab, Hammad Afzal, Fahim Arif, Abdul Ghafoor, Naima Iltaf, Muhammad Zakria, Muhammad Javed Hyder, Rafia Ahsan</i>	
Attention Distillation with Sample Re-weighting and Adaptive Margin for Low-Resolution Face Recognition	80
<i>Shulei Tang, Xiao Sun</i>	

Progressive Feature Alignment for Occluded Person Re-Identification	86
<i>Jiamin Liao, Zhaopeng Dou, Yixuan Fan, Yali Li, Shengjin Wang</i>	
Cow Face Recognition with Noise Labels Using Vision Transformer	93
<i>Hongyu Zhao, Pengfeng Li, Zhenling Chen, Kai Guo, Yiwen Chen, Chao Su</i>	
An Intelligent Recognition Method and System of “Phubber” Based on Object Detection and Pose Estimation Algorithm	99
<i>Tongshu Liu</i>	
Fusion of Visual and Acoustic Signals for Wildlife Recognition	107
<i>Chee Thong Ong, Tee Connie, Michael Kah Ong Goh, Kan Yeep Choo</i>	
➤ Classification Models and Algorithms	
Classification of Inflammatory Gene Expression Patterns with Machine Learning Models	115
<i>Yeonglong Ay, Yit Hong Choo, Asim Bhatti, Chee Peng Lim</i>	
Single-pixel Imaging Classification Method Based on Improved Lenet-5 Network	120
<i>Changchang Yang, Huibin Wang, Bingrui Xiao, Zhe Chen, Yang Bu</i>	
Mushroom Classification Based on Deep Residual Network	128
<i>Ju Feng, Xufeng Ling, Yubo Wang, Jie Yang</i>	
Exploration on the Effect of Text Preprocessing Based on Inflection Morphology and Attachment Morphology Restoration in Tibetan Text Classification	134
<i>Jie Yang, Nima Tashi, Sanke Deng, Dawa Dolma, Tshering Dondrub</i>	
A MobileNetV2-CBAM-based Model for Forest Fire Classification Using UAV Imagery	141
<i>Xinjie Deng, Burhan Khan, Chee Peng Lim, Ming-Yu Liao</i>	
Enhancing Relational Classification Model Fusing Entity and Sentence Semantic Information	147
<i>Chunji Wei, Xizhong Qin, Taiping Yuan</i>	
A Domain-aware Language-supervised Method for Image Emotion Classification	154
<i>Sinuo Deng, Ge Shi, Lifang Wu, Lehao Xing, Meng Jian, Yongluo Liu</i>	
➤ Computer Vision and Data Visualization	
Self-Supervised Learning for Point Clouds through Multi-crop Mutual Prediction	160
<i>Changyu Zeng, Wei Wang, Jimin Xiao, Anh Nguyen, Yutao Yue</i>	
Now You See Me: Robust Approach to Partial Occlusions	168
<i>Karthick Gunasekaran, Nikita Jaiman</i>	
Multi-view Clustering via Joint Self-representation and Semi-nonnegative Matrix Factorizations	176
<i>Xiaochun Fu, Xiangdong Zhang, Qin Li</i>	
Multi-View Stereo Reconstruction Based on Self-Attention and Pyramid Feature Representation	184
<i>Shuxu Jing, Yixin Zhang, Zhanwen Liu, Qingling Yue</i>	
Research on Image Tibetan Caption Generation Method Fusion Attention Mechanism	193
<i>Jianjun Xia, Xin Yang, Qiong Ni, Dingguo Gao</i>	
➤ Digital Image Analysis and Methods	
Face Image Inpainting with Parallel Multi-scale Feature Fusion Network	199
<i>Shanshan Yao, Yizhong Yang</i>	

Unsupervised Extremely Low-Light Image Enhancement with Content Preservation and Noise Suppression	205
<i>Yifei Sun, Wei Xu, Yingjie Ma, Shuo Xie</i>	
Multi-stage Progressive Reasoning for Dunhuang Murals Inpainting	211
<i>Wenjie Liu, Yuqing Shi, Jiacheng Li, Jianhua Wang, Shiqiang Du</i>	
Manipulation Mask Generator: High-Quality Image Manipulation Mask Generation Method Based on Modified Total Variation Noise Reduction.....	218
<i>Xinyu Yang, Jizhe Zhou</i>	
Generative Adversarial Network-based Algorithm for 3D Construction of Pedestrians	224
<i>Feng Wang, Weichuan Ni, Shaojiang Liu, Zhiping Wan</i>	
Mixed Attention Interleaved Execution Cascade Architecture for Fittings Instance Segmentation in Overhead Transmission Line Images	228
<i>Yilong Yang, Shangping Zhong, Kaizhi Chen</i>	
A Review of Ground Segmentation Methods for Vehicle-Mounted LiDAR Point Clouds	236
<i>Tayir Mijit, Arzigul Ahat, Askar Hamdulla</i>	
Research on Image Restoration Algorithms Based on Transformer Prediction Networks	243
<i>Qingjuan Wang, Shan Xiao, Yan Zhou, Lin Wang</i>	
Efficient Regression with Feature Selection Based on L12-Norm	250
<i>Yu Lei, Qin Li, Jane You</i>	
Research on Preprocessing and Feature Extraction Methods for Handwriting Images Based on Gabor Texture Learning	259
<i>Guzalnur Amrurla, Nurbiya Yadikar, Kurban Ubul</i>	
Extraction of Motion Change Points Based on the Physical Characteristics of Objects.....	263
<i>Eri Kuroda, Ichiro Kobayashi</i>	
➤ Medical Image and Physiological Signal Analysis	
Multimodal Federated Learning Framework Evaluation for Lymph Node Metastasis in Gynecologic Malignancies	269
<i>Ling Ma, Zhijun Hu, Ding Yue, Guangyu Wu, Xiaohua Shi, Shalayiding Sirejiding, Kaijiang Liu</i>	
A Self-supervised Framework with a Modified Hop-layer Network for Rehabilitation Exercise Assessment	274
<i>Zhixiang Pan, Jun Zhang</i>	
Comparison of Multi-Modal Federated Learning Framework and SPSS in the Evaluation of Lymph Node Metastasis Probability in Gynecological Malignancies.....	280
<i>Zhijun Hu, Ling Ma, Ding Yue, Guangyu Wu, Xiaohua Shi, Shalayiding Sirejiding, Kaijiang Liu</i>	
Joint Spatial Similarity-based Attention for Retina Vessel Segmentation with Super Resolution Encoding	285
<i>Favour Ekong, Yongbin Yu, Rutherford Agbeshi Patamia, Kwabena Sarpong, Chiagoziem C. Ukwuoma, Jingye Cai</i>	
Early Recognition of Sudden Cardiac Death Combined with Deep Transfer Learning and Superficial ECG Features	294
<i>Yue Zhang, Xingzeng Cha, Bingqian Cui, Dakun Lai</i>	
A Framework for Cognitive Load Recognition Based on Machine Learning and Multimodal Physiological Signals by Wearable Sensors.....	299
<i>Chenwei Wang, Xinyu Li, Jinyang Huang, Peng Zhao, Meng Wang, Guohang Zhuang, Xiao Sun</i>	
Deep Learning for Diagnosis of Endometrial Cancer and Atypical Endometrial Hyperplasia.....	307
<i>Aihua Zhao, Xin Zhu, Xin Du, Wenwen Wang, Wenqing Ma, Shixuan Wang</i>	

Gaze Behavior Based Depression Severity Estimation	313
<i>Tao Shu, Feixiang Zhang, Xiao Sun</i>	
Identification of Alzheimer’s Disease Associated Genes through Explicable Deep Learning and Bioinformatic	320
<i>Xiangrong Sun, Wei Shu, Yuxin Zhang, Xiansheng Huang, Juxia Liu, Yuan Liu, Tiejun Yang</i>	
➤ Intelligent Image Processing Technology and Engineering Applications	
Transformer-Based Two-Stream Network for Global and Local Motion Estimation	328
<i>Yihao Zheng, Zun Li, Zhuming Wang, Lifang Wu</i>	
Finger Pointnet: An End-to-end Embedded Network for 3D Fingerprint Verification	335
<i>Yixin Huang, Feng Liu, Dongliang Yang, Changjiang Song</i>	
Diffusion Probabilistic Model Based End-to-End Latent Fingerprint Synthesis	343
<i>Kejian Li, Xiao Yang</i>	
Progressive Dunhuang Murals Inpainting Based on Attention Mechanism	350
<i>Jiacheng Li, Yuqing Shi, Wenjie Liu, Jianhua Wang, Shiqiang Du</i>	
Scale-arbitrary Infrared Super-resolution Network Based on Channel Attention Mechanisms	357
<i>Qi Shao, Xin Zheng, Shinan Lang, Yuchen Zheng</i>	
Tibetan Handwritten Character Generation Based on CGAN Model.....	364
<i>Kai Guo, Dingguo Gao, Qijun Zhao</i>	
➤ Language Model and Text Detection	
Improving Biomedical Claim Detection Using Prompt Learning Approaches	369
<i>Tong Chen, Angelos Stefanidis, Zhengyong Jiang, Jionglong Su</i>	
Research on Sentiment Analysis of Tibetan Short Text Based on Dual-channel Hybrid Neural Network	377
<i>Yulei Zhu, Baima Luosai, Liyuan Zhou, Nuo Qun, Tashi Nyima</i>	
Chunk-BERT: Boosted Keyword Extraction for Long Scientific Literature via BERT with Chunking Capabilities	385
<i>Yuan Zheng, Rihui Cai, Maihemuti Maimaiti, Kahaerjiang Abiderexiti</i>	
Prompting Large Language Models for Malicious Webpage Detection.....	393
<i>Lu Li, Bojie Gong</i>	
Fake News Detection Based on Cross-modal Co-attention	401
<i>Yadong Gu, Mijit Ablimit, Askar Hamdulla</i>	
Text Proofreading Method for Tibetan Sound Similarity Syllables Based on Soft-Masked BERT	407
<i>Rengong Zheng, Jie Zhu, Ciren Dunzhu</i>	
➤ Speech Recognition and Semantic Analysis	
Chunking of Setswana Noun and Verb Phrases.....	413
<i>Gabofetswe Malema, Moffat Motlanka, Boago Okgetheng</i>	
A Novel Semantic Segmentation Self-training Framework Based on Improved Ham Model	419
<i>Hao Gu, Askar Hamdulla, Eksan Firkat, Bei Peng</i>	
Mongolian Compound Word Semantic Web Word Vector Evaluation Research	425
<i>Du La, Hasi, Yang Ding</i>	

Keyword Spotting Based on Efficient Neural Architecture Search	432
<i>Wenchen Liu, Zihua Huang, Dafei Wang</i>	
Hot Topic Clustering Based on Gaussian Mixture Model Built-in DTW	437
<i>Chenggang Lu, Jiaqi Li</i>	
The Construction of Mongolian Lexical Semantic Net about Horse Culture and Economy	444
<i>BuYinqiqige, Hasi, Nariga</i>	
Attention-CNN Combined with Multi-layer Feature Fusion for English L2 Multi-granularity Pronunciation Assessment	449
<i>Jianlei Yang, Aishan Wumaier, Zaokere Kadeer, Liejun Wang, Shen Guo, Jing Li</i>	
Research on End-to-end Tibetan Speech Recognition Acoustic Model Based on Multi-scale Features	458
<i>Jiawen Wang, Dingguo Gao, Quzhen Suolang</i>	
➤ Intelligent Q&A System and Recommendation System	
Construction of Knowledge Graph Based on the Four Treatises of Tibetan Medicine and Its Searching System	463
<i>Tianhao Shan, Nuo Qun, Anna Zhu, Panduo Mima, Gadeng Lobsang, Yang Cui</i>	
Research and Design of a Chinese Chatbot with Emotion	470
<i>Yan Zhou, Zixi Dai, Qingjuan Wang, Lingling Ren</i>	
BEKBQA: Improving Knowledge Base Question Answering with a Bidirectional Entity Scoring Model	475
<i>Jiaming Li, Liang He, Hanhan Ma, Shaolei Wang, Sheng Yi, Weiwei Hu</i>	
Robot Debater: Debate-styled Text Auto-generation System Based on Large Foundation Language Models	483
<i>Yu Zhu, Yijun Ling, Xufeng Ling, Jie Yang</i>	
RarKGQA: Multi-hop Question and Answering Method Based on Knowledge Graph Embedding	491
<i>Fangri Ren, Gulila Altenbek, Yajing Ma, Gulizada Haisa</i>	
ShoppingGPT: A GPT-based Product Recommendation Dialogue System	501
<i>Renjie Yu, Yujing Guan, Yuancheng Zhan</i>	
➤ Modern Speech Processing Models and Technologies	
MetricGAN+ Speech Enhancement Model Combining Multi-scale and Multi-resolution Feature Network and Joint Perception Loss	510
<i>Chuangjian Guo, Zihua Huang, Hui Li, Jingyi Song</i>	
Text-Independent Speaker Verification Based on 3D Inception-Resnet	515
<i>Zhengyong Qiu, Xiang Sun, Meng Sun, Li Jia</i>	
Efficient Channel Attention for Speech Emotion Recognition with Asymmetric Convolution Module	522
<i>Tianqi Wu, Liejun Wang, Shuli Cheng, Jiang Zhang</i>	
➤ Data Analysis and Computing Model Based on Machine Learning	
Machine Learning Method Evaluates Upper-Limb Motor Function by fNIRS in Stroke Patients	528
<i>Weiwei Xu, Yi Tao, Jialin Zhu, Ziwen Yuan, Jing Guo, Gang Wang</i>	
A Novel Contrastive Clustering Algorithm Based on K-means	535
<i>Yu Yun, Geng Yang, Qin Li, Jane You</i>	
Credit Default Prediction Based on Adaptive Strategy for BWOA-CatBoost	543
<i>Guoqiang Wang, Shuxian Liu, Zhida Liu</i>	

Study on Wind Forecasting for Beijing 2022 Winter Olympic Games Based on Unsupervised Machine Learning	552
<i>Haoye Liu, Yuhui Duan, Jiangbo Li, Tongtong Li</i>	
The New Answer to Drug Discovery: Quantum Machine Learning in Preclinical Drug Development.....	557
<i>Yew Kee Wong, Yifan Zhou, Yan Shing Liang, Haichuan Qiu, Yu Xi Wu, Bin He</i>	
Ctransnet: A Modern Deep Learning Model to Estimate Tropical Cyclone Intensity	565
<i>Xingchen Shan, Jiagen Li, Kaijun Ren</i>	
Cookie-less Predictive Targeting in Programmatic Media Using Topic Modelling	571
<i>Allan Abraham, Joshikaa R, Sachin Kumar</i>	
Method of the Kernel-based Maximum Entropy Fuzzy C-means Clustering	577
<i>Weiye Chen, Kunping Zhu</i>	
Performance Evaluation of Fiber Waste-Reinforced Polymer Using Backpropagation Neural Network Model and Finite Element Analysis	585
<i>Gladys C. Vista, Dante L. Silva</i>	
Zeroth Order GreedyLR: An Adaptive Learning Rate Scheduler for Deep Neural Network Training	593
<i>Shreyas Subramanian, Vignesh Ganapathiraman</i>	
UniQNatyam: An Approach Towards Non-Repetitive Dance Generation	602
<i>Vibha Murthy, Vidisha Chandra, Vishakha Hegde, Rayudu Srishti, K S Srinivas</i>	
➤ Advanced Information Theory and Network Technology	
Unsupervised Bearing Fault Diagnosis Method for Complex Electromechanical Hydraulic System	608
<i>Zizhou He, Wenwen Shen, Suicheng Li, Tianyou Yuan, Xiaowei Zhou, Zhigao Ni</i>	
Joint Transmit and Receive Antenna Selection Based on Cat Swarm Optimization	613
<i>Lin Xie, Wenqing Ni, Guowei Lei, Shuicao Zheng</i>	
A Pruning Method with Adaptive Adjustment of Channel Pruning Rate	618
<i>Zhongjin Zhao, Haijun Liu, Zhiwei Li, Chenxi Zhang, Tuo Ma, Jie Peng</i>	
AI Based Scheduling Protocol for Cognitive Radio Adhoc Networks	624
<i>Abdur Rashid Sangi, Lokeshwari Anamalamudi, Mohammed S Alkathairi, ReddyPriya Madupuri, Satish Anamalamudi, Sobin C C</i>	
Assessment and Prediction of Corrosion Rate of Marine Railway Bridges Based on Ridge Regression Model	631
<i>Huan Wang, Zhengbin Chen</i>	
Indoor Fire Detection System Based on Multi-sensor Information Fusion Algorithm.....	637
<i>Qingjuan Wang, Jinyue Lin, Yan Zhou, Huibin Luo, Ren Zhao</i>	
An Embedding-Based Approach to the Ontology Matching Problem.....	642
<i>Achref Benarab, Guisheng Yin, Fahad Rafique</i>	
Syncfree Optimizers and Compiler Improvements for Efficient Model Training	650
<i>Shreyas Subramanian, Corey Barrett, Yanming Wang, Ricky Das, Harish Tummalacherla, Lokeshwaran Ravi, Vinay Kumar Burugu, Yi-Hsiang Lai</i>	
RFBiCF: A Relation-First Bidirectional Cascade Framework for Relational Triple Extraction	656
<i>Deng jinxin, Qin Xizhong, Yang Rong, Lv Xiaoyi</i>	
➤ Author Index	