2023 IEEE International Conference on Medical Artificial Intelligence (MedAI 2023)

Beijing, China 18-19 November 2023



IEEE Catalog Number: CFP23UO0-POD ISBN:

979-8-3503-5879-7

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:
 CFP23UO0-POD

 ISBN (Print-On-Demand):
 979-8-3503-5879-7

 ISBN (Online):
 979-8-3503-5878-0

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



2023 IEEE International Conference on Medical Artificial Intelligence (MedAI) MedAI 2023

Table of Contents

Foreword	xvi
Acknowledgement	xviii
Committee Members	xix
Automated Medicine and Automated AI (1)	
Path Signature Representation of Patient-Clinician Interactions as a Predictor for Neuropsychological Tests Outcomes in Children: A Proof of Concept	1
A Method and Practice for Menopausal Disease Prediction Based on Knowledge Graph . Yue Fang (Peking University, China), Yongxin Xu (Peking University, China), Hongxin Ding (Peking University, China), Junfeng Zhao (Peking University, Nanhu Laboratory, China), Yasha Wang (Peking University, China), and Hongyan Jin (Peking University, China)	10
Neural Network-Based Simulation and Circuit Analysis of Sub-Centimeter Coils for Implantable Medical Devices	19
SLMF: Adaptive Short-Long Multi-Stage Fusion for Emotion Recognition in Conversation Yulin Zhao (Institute of Information Engineering, Chinese Academy of Sciences; UCAS, China), Zheng Lin (Institute of Information Engineering, Chinese Academy of Sciences, China), Weiping Wang (Institute of Information Engineering, Chinese Academy of Sciences, China), and Xu Zhou (State Grid Jiangsu Electric Power CO., LTD., China)	n 28

Automated Medicine and Automated AI (2)

Double-Rule Causal Feature Selection in Risk Factor Mining for Disease Diagnosis	7
Exploring the metaverse in hepatobiliary and pancreatic surgery: a case report	3
Outside-Knowledge Visual Question Answering for Visual Impaired People	9
An Online Tool for Understanding and Monitoring COVID-19 Trends and Spread Based on Self-Reporting Tweets	5
Automated Medicine and Automated AI (3)	
Large Language Models Improve Alzheimer's Disease Diagnosis Using Multi-Modality Data 6 Yingjie Feng (Zhejiang University, China), Xiaoyin Xu (Zhejiang University, China), Yueting Zhuang (ZhejiangUniversity, China), and Min Zhang (Zhejiang University, China)	1
ShennongGPT: A Tuning Chinese LLM for Medication Guidance	7

Prompting Meta-Learned Hierarchical Graph Network for Molecular Property Prediction
Biomedical Informatics and Bionic AI (2)
Multi-view Disease-Symptom Association Prediction Based on Disease Knowledge Graph Embedding
Discovery of Disease Evolution by Graph Curvature
Out-of-Distribution Generalized Dynamic Graph Neural Network for Human Albumin Prediction 153
Zeyang Zhang (Tsinghua University, China), Xingwang Li (Southwest Jiaotong University, China), Fei Teng (Southwest Jiaotong University, China), Ning Lin (Southwest Jiaotong University, China), Xueling Zhu (Central South University, China), Xin Wang (Tsinghua University, China), and Wenwu Zhu (Tsinghua University, China)
CellMirror: Deciphering Cell Populations from Spatial Transcriptomics Data by Interpretable Contrastive Learning
Subnetwork Mining Based on Structure Entropy for Analyzing Depression Disease

Biomedical Informatics and Bionic AI (3)

XG-DTA: Drug-Target Affinity Prediction Based on Drug Molecular Graph and Protein Sequence Combined with XLNet Han Zhou (Beijing Institute of Technology, China), Xiumin Shi (Beijing Institute of Technology, China), Yuxiang Wang (Beijing Institute of Technology, China), Ziyang Wen (Beijing Institute of Technology, China), Ziyang Wen (Beijing Institute of Technology, China), and Jiaqi Peng (Beijing Institute of Technology, China)	189
CAHAN: Drug-Disease Association Prediction Based on Cross-Attention Mechanism	197
Graph Generation with Recurrent and Graph Neural Networks	203
Positive Sample Augmentation with Graph Mixup for DDI Prediction	209
China), and Qiang Zhou (Shenzhen Center for Prehospital Care, China)	
China), and Qiang Zhou (Shenzhen Center for Prehospital Care, China)	217
China), and Qiang Zhou (Shenzhen Center for Prehospital Care, China) Infrastructure of Medicine and Generative AI (1) Context-Aware Clinical Diagnosis Prediction via Hierarchical Ontology Representation	

Type-Representation Enhanced Event Detection via Structure Encoder Yuming Feng (University of Chinese Academy of Sciences; Institute of Computing Technology, Chinese Academy of Science), Linmeng Huang (University of Chinese Academy of Sciences; Institute of Computing Technology, Chinese Academy of Science), Haozhe Liang (Institute of Systems Engineering, Academy of Military Science), Xiaolong Jin (University of Chinese Academy of Sciences; Institute of Computing Technology, Chinese Academy of Science), Saiping Guan (University of Chinese Academy of Sciences; Institute of Computing Technology, Chinese Academy of Science), and Jiafeng Guo (University of Chinese Academy of Sciences; Institute of Computing Technology, Chinese Academy of Sciences)	
Infrastructure of Medicine and Generative AI (2)	
A ModelOps-Based Framework for Intelligent Medical Knowledge Extraction	
Construction of Chinese Electronic Medical Record Entity and Entity Relation Annotation Corpus for Pediatric Bronchopneumonia Disease	
CQUPT-FL: Cross-Domain Sharing and Security Awareness and Early Warning Platform of Health Science Big Data	
Infrastructure of Medicine and Generative AI (3)	
Ambulance Location Optimization via Fine-Grained Emergency Demand Forecasting	
Zero-Shot Construction of Chinese Medical Knowledge Graph with ChatGPT	

A Review on Code Generation with LLMs: Application and Evaluation	34
A Flexible Framework of General Clinical Data Quality Control System Yandong Yan (Peking University, China), Zhengmin Gu (The First Hospital of China Medical University, China), Yiwei Lou (Peking University, China), Xiongwei Tang (Shenzhen Traditional Chinese Medicine Hospital, China), Haozheng Lv (Peking University, China), Jia Wu (Shenzhen Traditional Chinese Medicine Hospital, China), and Min Pi (Shenzhen Traditional Chinese Medicine Hospital, China)	€
Infrastructure of Medicine and Generative AI (4)	
A Knowledge-Enhanced Medical Named Entity Recognition Method that Integrates pre-Trained Language Models	96
Secure and Efficient Federated Statistical Tests for Medical Data Based on TEE and Secure Resharing Protocols	02
Thematic Event Extraction Based on Event-Related Sentence Detection Xing Zhang (University of Chinese Academy of Sciences; CAS Key Laboratory of Network Data Science and Technology, China), Yucan Guo (University of Chinese Academy of Sciences; CAS Key Laboratory of Network Data Science and Technology, China), Xiaolong Jin (University of Chinese Academy of Sciences; CAS Key Laboratory of Network Data Science and Technology, China), Haozhe Liang (Institute of Systems Engineering, Academy of Military Science, China), and Saiping Guan (University of Chinese Academy of Sciences; CAS Key Laboratory of Network Data Science and Technology, China))8
Optimization of Implantable Ultrasonic Friction Nano Wireless Power Supply Circuits	14

Medical Images and Bionic AI (1)

Multi-Scale Style Aggregation Transformer-Based Network (MSAT-Net) for Multi-Contrast MR Restoration: Super Resolution and Motion Artifact Reduction	
Arrhythmia Detection from Electrocardiogram Signal Data Based on Wavelet Transform and Deep Reinforcement Learning	325
DCSN: A Flexible and Efficient Lightweight Network for Dense Cell Segmentation	334
MedPipe: End-to-End Joint Search of Data Augmentation and Neural Architecture for 3D Medical Image Classification	344
Medical Images and Bionic AI (2)	
A Deep Learning Method for Colon Polyp Segmentation with Better Universality	355
An Electrocardiogram Augmentation Method for Automatic Detection of ST-Segment Elevation Myocardial Infarction and Culprit Vessel	
Few-Shot Fine-Grained Classification of Histological Images Yingdong Jiang (Jilin University, China), Jing Huang (Jilin University, China), Zihe Jin (Jilin University, China), Leqi Shen (Jilin University, China), and Ziyi Zhang (Jilin University, China)	372
Glomerular Classification of Membranous Nephropathy Based on Deep Residual Learning with Large Resolution Images	

ToC-Net: Combining Channel Attention for Targeted Optimization of Stroke Segmentation	24
Networks	>4
Medical Images and Collective AI (1)	
GREAT-IQA: Integrating Global Perception and Local Task-Specific Information for CT Image Quality Assessment	36
OUSC-Net: Optimization-Based Unfolding Network for Super-Resolution Reconstruction of CEST-MRI	95
MED-INPAINT: Medical Image Synthesis Using Multi-Level Conditional Inpainting with a Denoising Diffusion Probabilistic Model and Adaptive Contrast Priors)3
SliceProp: A Slice-Wise Bidirectional Propagation Model for Interactive 3D Medical Image Segmentation	14
Medical Images and Collective AI (2)	
M2CF-Net: a Multi-Resolution and Multi-Scale Cross Fusion Network for Segmenting Pathology Lesion of the Focal Lymphocytic Sialadenitis	25

VAC-UNet: Visual Attention Convolution U-Net for 3D Medical Image Segmentation	435
FusNet: A Deep Information Fusion Network for Medical Image Segmentation	441
Automatic Skin Lesion Segmentation Based on Higher-Order Spatial Interaction Model	447
Medical Images and Collective AI (3)	
A Novel Conditional Medical Image Generation GAN with Latent Space Optimal Transport Jun Wang (Zhejiang University, China), Bohan Lei (Zhejiang University, China), Xiaoyin Xu (Zhejiang University, China), Yueting Zhuang (Zhejiang University, China), and Min Zhang (Zhejiang University, China)	. 453
A Multivariate Logistic Regression Model with Over Sampling for Bronchopulmonary Dysplasia	
Associated with Pulmonary Hypertension in Very Preterm Infants: A Multi-Center	4E0
Retrospective Study	. 439
Southern Medical University, China), Shuwei Huang (Tsinghua	
University, China), Jingke Cao (The Seventh Medical Center of CPLA	
General Hospital; Southern Medical University, China), Zhichun Feng	
(The Seventh Medical Center of CPLA General Hospital; Southern Medical	
University, China), Qiannan Jiang (Qingdao Women and Children's	
Hospital, China), Wanxian Zhang (Tianjin Central Hospital of	
Gynecology Obstetrics, China), Jia Chen (Guangdong Women and Children	
Hospital, China), Changgen Liu (The Seventh Medical Center of CPLA	
General Hospital; Southern Medical University, China), Wenyu Liao	
(BNU-HKBU United International College, China), Le Zhang (BNU-HKBU	
United International College, China), Guli Zhu (BNU-HKBU United	
International College, China), Wenhao Guo (BNU-HKBU United International College, China), Lin Liu (Tsinghua University, China),	
Jingwei Yang (BNU-HKBU United International College, China), and	
Qiuping Li (The Seventh Medical Center of CPLA General Hospital, China)	

Author Index	
--------------	--