

Tongliang Liu  
Geoff Webb  
Lin Yue  
Dadong Wang (Eds.)

LNAI 14471

# AI 2023: Advances in Artificial Intelligence

36th Australasian Joint Conference on Artificial Intelligence, AI 2023  
Brisbane, QLD, Australia, November 28 – December 1, 2023  
Proceedings, Part I

1  
Part I

AI 2023

 Springer

MOREMEDIA 

Lecture Notes in Computer Science

**Lecture Notes in Artificial Intelligence**

**14471**

Founding Editor

Jörg Siekmann

Series Editors

Randy Goebel, *University of Alberta, Edmonton, Canada*

Wolfgang Wahlster, *DFKI, Berlin, Germany*

Zhi-Hua Zhou, *Nanjing University, Nanjing, China*

The series Lecture Notes in Artificial Intelligence (LNAI) was established in 1988 as a topical subseries of LNCS devoted to artificial intelligence.

The series publishes state-of-the-art research results at a high level. As with the LNCS mother series, the mission of the series is to serve the international R & D community by providing an invaluable service, mainly focused on the publication of conference and workshop proceedings and postproceedings.

Tongliang Liu · Geoff Webb · Lin Yue ·  
Dadong Wang  
Editors

# AI 2023: Advances in Artificial Intelligence

36th Australasian Joint Conference on Artificial Intelligence, AI 2023  
Brisbane, QLD, Australia, November 28 – December 1, 2023  
Proceedings, Part I

*Editors*

Tongliang Liu   
The University of Sydney  
Darlington, NSW, Australia

Lin Yue   
The University of Newcastle  
Callaghan, NSW, Australia

Geoff Webb   
Monash University  
Clayton, VIC, Australia

Dadong Wang   
CSIRO Data61  
Sydney, NSW, Australia

ISSN 0302-9743                      ISSN 1611-3349 (electronic)  
Lecture Notes in Artificial Intelligence  
ISBN 978-981-99-8387-2              ISBN 978-981-99-8388-9 (eBook)  
<https://doi.org/10.1007/978-981-99-8388-9>

LNCS Sublibrary: SL7 – Artificial Intelligence

© The Editor(s) (if applicable) and The Author(s), under exclusive license  
to Springer Nature Singapore Pte Ltd. 2024

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.  
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Paper in this product is recyclable.

# Preface

This volume contains the papers presented at the 36th Australasian Joint Conference on Artificial Intelligence, AJCAI 2023. The conference was held during November 28 – December 1, 2023, and was hosted by the University of Queensland in Brisbane, Australia. This annual conference is one of the longest running conferences in artificial intelligence, with the first conference held in Sydney in 1987. The conference remains the premier event for artificial intelligence in Australasia, offering a forum for researchers and practitioners across all subfields of artificial intelligence to meet and discuss recent advances.

AJCAI 2023 received 213 submissions and each submission was reviewed by at least two Program Committee (PC) members or external reviewers in a double-blind process (over 90% of the submissions had three reviews). After a thorough discussion and rigorous scrutiny by the reviewers, 24 papers were accepted for long oral presentation and 58 papers were accepted for oral presentation at the conference. In total, 82 submissions were accepted for publication as full papers in these proceedings with an acceptance rate of 38% (the acceptance rate of the long oral presentations was 11%). AJCAI 2023 had six keynote talks by the following distinguished scientists: Ling Chen from the University of Technology Sydney, Australia; Manik Varma from Microsoft Research India, India; Peter Soyer from the University of Queensland, Australia; Maria Garcia De La Banda from Monash University, Australia; Mengjie Zhang from Victoria University of Wellington, New Zealand; and Dadong Wang from Data61, Australia.

The following are notable aspects of the AJCAI 2023 conference:

- AJCAI 2023 was jointly held with the Defence Artificial Intelligence 2023 Symposium (November 27, 2023). The Defence Artificial Intelligence Symposium is an exciting opportunity for Defence and AI researchers to come together and explore priorities, opportunities, and commonalities.
- AJCAI 2023 included a day with a special industry focus. Panel discussions allowed industry and academia to share challenges and research directions.
- AJCAI 2023 included four workshops, held on November 28: Foundations for Robust AI: Self-Supervised Learning, organised by Saimunur Rahman, David Hall, Stephen Hausler, and Peyman Moghadam; Federated Learning in Australasia: When FL Meets Foundation Models, organised by Guodong Long, Han Yu, and Tao Shen; Artificial Intelligence Enabled Trustworthy Recommendations, organised by Shoujin Wang, Rocky Tong Chen, Hongzhi Yin, Lina Yao, and Fang Chen; and Machine Learning for Data-Driven Optimization, organised by Xilu Wang, Xiangyu Wang, Shiqing Liu, and Yaochu Jin.
- AJCAI 2023 included three tutorials, held on November 28: Reinforcement Learning for Automated Negotiation Supply Chain Management League as an Example, presented by Yasser Mohammad; Towards Communication-Efficient and Heterogeneity-Robust Federated Learning, presented by Guodong Long and Yue Tan; and Decoding

the Grammar of DNA Using Natural Language Processing, presented by Tyrone Chen and Sonika Tyagi.

- AJCAI 2023 included a PhD Forum, held on November 28, to mentor and assist post-graduate students developing their research, with mentorship provided by research leaders. Limited travel support was provided.

We especially appreciate the work of the members of the Program Committee and the external reviewers for their expertise and tireless effort in assessing the papers within a strict timeline. We are also very grateful to the members of the Organising Committee for their efforts in the preparation, promotion, and organisation of the conference, especially the General Chairs, Dacheng Tao, Sally Cripps, and Janet Wiles, for coordinating the whole event.

Lastly, we thank the National Committee for Artificial Intelligence of the Australian Computer Society; Springer, for the professional service provided by the Lecture Notes in Artificial Intelligence editorial and publishing teams; and our conference sponsors: the Australian Computer Society; the Defence Artificial Intelligence Research Network; Pioneer Computers; the School of Computer Science at the University of Sydney; the School of Electrical Engineering and Computer Science at the University of Queensland; the Human Technology Institute at the University of Technology Sydney; the Adelaide University; and the UNSW AI Institute.

October 2023

Tongliang Liu  
Miao Xu  
Geoff Webb

# Organization

## General Chairs

Dacheng Tao	The University of Sydney, Australia
Sally Cripps	University of Technology Sydney, Australia
Janet Wiles	The University of Queensland, Australia

## Program Chairs

Tongliang Liu	The University of Sydney, Australia
Miao Xu	The University of Queensland, Australia
Geoff Webb	Monash University, Australia

## Proceedings Chairs

Weitong Chen	The University of Adelaide, Australia
Lin Yue	The University of Newcastle, Australia
Dadong Wang	Data61, Australia

## Senior Program Committee

Jing Jiang	University of Technology Sydney, Australia
Mingyu Guo	The University of Adelaide, Australia
Jonathan Kummerfeld	University of Sydney, Australia
Hua Zuo	University of Technology Sydney, Australia
Shuo Chen	RIKEN, Japan
Zhongyi Han	Mohamed Bin Zayed University of Artificial Intelligence, United Arab Emirates
Runnan Chen	The University of Hong Kong, China
Jingfeng Zhang	University of Auckland, New Zealand
Feng Liu	The University of Melbourne, Australia
Huong Ha	RMIT University, Australia
Soyeon Han	University of Western Australia, Australia
Zhanna Sarsenbayeva	The University of Sydney, Australia
Mingming Gong	The University of Melbourne, Australia
Yu Yao	Usyd
Yuxuan Du	The University of Sydney, Australia



Clément Canonne	University of Sydney, Australia
Miaomiao Liu	Australian National University, Australia
Dawei Zhou	Xidian University, China
Yadan Luo	University of Science and Technology of China, China
Xiaobo Xia	The University of Sydney, Australia
Guanfeng Liu	Macquarie University, Australia
Zhen Fang	University of Technology Sydney, Australia
Hien Nguyen	University of Queensland, Australia

## Program Committee

Ravneet Singh Arora	Block Inc, USA
Adnan Mahmood	Macquarie University, Australia
Yue Yuan	Shandong University, China
Syedamin Pouriye	Kennesaw State University, USA
Yexiong Lin	The University of Sydney, Australia
Jiahui Gao	The University of Hong Kong, China
Xianzhi Wang	University of Technology Sydney, Australia
Zhuo Huang	Nanjing University of Science and Technology, China
Alex Chu	Beihang University, China
Ruihong Qiu	The University of Queensland, Australia
Qingzheng Xu	National University
Qiang Qu	The University of Sydney, Australia
Lynn Miller	Monash University, Australia
Zhuonan Liang	The University of Sydney, Australia
Kun Han	The University of Queensland, Australia
Tim Miller	The University of Queensland, Australia
Zhuoxiao Chen	The University of Queensland, Australia
Kun Wang	University of Technology Sydney, Australia
Changqin Huang	South China Normal University, China
Peng Yuwei	Wuhan University, China
Brendon J. Woodford	University of Otago, New Zealand
Weihua Li	Auckland University of Technology, New Zealand
Mingzhe Zhang	The University of Queensland, Australia
Peter Baumgartner	CSIRO, Australia
Manolis Gergatsoulis	Ionian University, Greece
Dianhui Wang	La Trobe University, Australia
Jianan Fan	University of Sydney, Australia
Xueping Peng	University of Technology Sydney, Australia
Kairui Guo	University of Technology Sydney, Australia

Zehong Cao	University of South Australia, Australia
Wenhao Yang	Nanjing University, China
Yi Gao	Southeast University, China
Yi Mei	Victoria University of Wellington, New Zealand
Chenhao Zhang	University of Queensland, Australia
Youquan Liu	Hochschule Bremerhaven, Germany
Wenhua Zhang	Shanghai University, China
Yu Yao	MBZUAI, UAE & CMU, USA
Hao Hou	Nanjing University of Science and Technology, China
Yuan Liu	The University of Hong Kong, China
Jianlong Zhou	University of Technology Sydney, Australia
Ran Wang	University of Technology Sydney, Australia
Jun Wang	The University of Sydney, Australia
Weijia Zhang	The University of Newcastle, Australia
Zhuoyun Ao	Defence Science and Technology Organisation
Xinheng Wu	University of Technology Sydney, Australia
Abdul Sattar	Griffith University, Australia
Daokun Zhang	Monash University, Australia
Ge-Peng Ji	Wuhan University, China
Dongting Hu	The University of Melbourne, Australia
Chengbin Du	The University of Sydney, Australia
Ying Bi	Victoria University of Wellington, New Zealand
Rafal Rzepka	Hokkaido University, Japan
Cong Lei	The University of Sydney, Australia
Yue Tan	University of Technology Sydney, Australia
Hongwei Sheng	The University of Queensland, Australia
M. A. Hakim Newton	University of Newcastle, Australia
Shaokun Zhang	Penn State University, USA
Pengqian Lu	The University of Sydney, Australia
Peng Yan	Nanjing University of Post and Telecommunication, China
Weidong Cai	The University of Sydney, Australia
Huan Huo	University of Technology Sydney, Australia
Yuhao Wu	The University of Sydney, Australia
Rui Dai	University of Science and Technology of China, China
Fangfang Zhang	Victoria University of Wellington, New Zealand
Xiaobo Xia	The University of Sydney, Australia
Giorgio Gnecco	IMT - School for Advanced Studies, Lucca, Italy
Yu Zheng	The Chinese University of Hong Kong, China
Ickjai Lee	James Cook University, Australia

Jiepeng Wang	The University of Hong Kong, China
Qizhou Wang	Hong Kong Baptist University, China
Chen Liu	University of Technology Sydney, Australia
Yuanyuan Wang	The University of Melbourne, Australia
Wei Duan	The Australian Artificial Intelligence Institute (AAII), and University of Technology Sydney, Australia
Aoqi Zuo	The University of Melbourne, Australia
Yiming Ren	ShanghaiTech University, China
Stephen Chen	York University, Canada
Wenjie Wang	The University of Melbourne, Australia
Zhiyuan Li	University of Sydney, Australia
Tao Shen	Microsoft, China
Guangzhi Ma	University of Technology Sydney, Australia
Haodong Chen	The University of Sydney, Australia
Yu Lu	University of Technology Sydney, Australia
Angus Dempster	Monash University, Australia
Jing Teng	North China Electric Power University, China
Yawen Zhao	The University of Queensland, Australia
Harith Al-Sahaf	Victoria University of Wellington, New Zealand
Pengxin Zeng	Sichuan University, China
Hangyu Li	Xidian University, China
Huaxi Huang	CSIRO, Australia
Bernhard Pfahringer	University of Waikato, New Zealand
Huiqiang Chen	University of Technology Sydney, Australia
Xin Yu	University of Technology Sydney, Australia
Yanjun Zhang	University of Technology Sydney, Australia
Bach Nguyen	Victoria University of Wellington, New Zealand
Peng Mi	Xiamen University, China
Jiyang Zheng	University of Sydney, Australia
Rundong He	Shandong University, China
Shikun Li	Chinese Academy of Sciences, China
Kevin Wong	Murdoch University, Australia
Xiu-Chuan Li	Chinese Academy of Science, China
Jianglin Qiao	Western Sydney University, Australia
Maurice Pagnucco	The University of New South Wales, Australia
Bing Wang	The University of New South Wales, Australia
Zhaoqing Wang	The University of Sydney, Australia
Mark Reynolds	The University of Western Australia, Australia
Xuyun Zhang	Macquarie University, Australia
Zige Wang	Peking University, China
Chang Wei Tan	Monash University, Australia

Muyang Li	The University of Sydney, Australia
Guangyan Huang	Deakin University, Australia
Liangchen Liu	Xidian University, China
Nayyar Zaidi	Deakin University, Australia
Erdun Gao	The University of Melbourne, Australia
Chuyang Zhou	The University of Sydney, Australia
Shaofei Shen	The University of Queensland, Australia
Yixuan Qiu	The University of Queensland, Australia
Jianhua Yang	UWS, Australia
Keqiuyin Li	University of Technology Sydney, Australia
Yanjun Shu	Harbin Institute of Technology, China
Lingdong Kong	National University of Singapore, Singapore
Jingyu Zhang	City University of Hong Kong, China
Sung-Bae Cho	Yonsei University, South Korea
Shuxiang Xu	University of Tasmania, Australia
Wan Su	Shandong University, China
Markus Wagner	The University of Adelaide, Australia
Xiaoying Gao	Victoria University of Wellington, New Zealand
William Bingley	The University of Queensland, Australia
Sishuo Chen	Peking University, China
Hao Sun	Shandong University, China
Ming Zhou	Hefei University of Technology, China

## Sponsors





# Contents – Part I

## Computer Vision

Multi-graph Laplacian Feature Mapping Incorporating Tag Information for Image Annotation .....	3
<i>Yan Liu, Qianqian Shao, Rui Cheng, Weifeng Liu, and Baodi Liu</i>	
Short-Term Solar Irradiance Forecasting from Future Sky Images Generation .....	15
<i>Hoang Chuong Nguyen and Miaomiao Liu</i>	
No Token Left Behind: Efficient Vision Transformer via Dynamic Token Idling .....	28
<i>Xuwei Xu, Changlin Li, Yudong Chen, Xiaojun Chang, Jiajun Liu, and Sen Wang</i>	
Story Sifting Using Object Detection Techniques .....	42
<i>Wilkins Leong, Julie Porteous, and Jonathan Thangarajah</i>	
SimMining-3D: Altitude-Aware 3D Object Detection in Complex Mining Environments: A Novel Dataset and ROS-Based Automatic Annotation Pipeline .....	55
<i>Mehala Balamurali and Ehsan Mihankhah</i>	
Oyster Mushroom Growth Stage Identification: An Exploration of Computer Vision Technologies .....	67
<i>Lipin Guo, Wei Emma Zhang, Weitong Chen, Ni Yang, Queen Nguyen, and Trung Duc Vo</i>	
Handling Heavy Occlusion in Dense Crowd Tracking by Focusing on the Heads .....	79
<i>Yu Zhang, Huaming Chen, Zhongzheng Lai, Zao Zhang, and Dong Yuan</i>	
SAR2EO: A High-Resolution Image Translation Framework with Denoising Enhancement .....	91
<i>Shenshen Du, Jun Yu, Guochen Xie, Renjie Lu, Pengwei Li, Zhongpeng Cai, and Keda Lu</i>	
A New Perspective of Weakly Supervised 3D Instance Segmentation via Bounding Boxes .....	103
<i>Qingtao Yu, Heming Du, and Xin Yu</i>	

Large-Kernel Attention Network with Distance Regression and Topological  
Self-correction for Airway Segmentation ..... 115  
*Yan Hu, Erik Meijering, and Yang Song*

**Deep Learning**

WeightRelay: Efficient Heterogeneous Federated Learning on Time Series ..... 129  
*Wensi Tang and Guodong Long*

Superpixel Attack: Enhancing Black-Box Adversarial Attack  
with Image-Driven Division Areas ..... 141  
*Issa Oe, Keiichiro Yamamura, Hiroki Ishikura, Ryo Hamahira,  
and Katsuki Fujisawa*

Cross Domain Pulmonary Nodule Detection Without Source Data ..... 153  
*Rui Xu, Yong Luo, and Yan Xu*

3RE-Net: Joint Loss-REcovery and Super-REsolution Neural Network  
for REal-Time Video ..... 165  
*Liming Ge, David Zhaochen Jiang, and Wei Bao*

Neural Networks in Forecasting Financial Volatility ..... 178  
*Wenbo Ge, Pooia Lalbakhsh, Leigh Isai, and Hanna Suominen*

CLIP-Based Composed Image Retrieval with Comprehensive Fusion  
and Data Augmentation ..... 190  
*Haoqiang Lin, Haokun Wen, Xiaolin Chen, and Xuemeng Song*

LiDAR Inpainting of UAV Based 3D Point Cloud Using Supervised  
Learning ..... 203  
*Muhammad Talha, Aya Hussein, and Mohammed Hossny*

A Sampling Method for Performance Predictor Based on Contrastive  
Learning ..... 215  
*Jingrong Xie, Yuqi Feng, and Yanan Sun*

AdaptMatch: Adaptive Consistency Regularization for Semi-supervised  
Learning with Top-k Pseudo-labeling and Contrastive Learning ..... 227  
*Nan Yang, Fan Huang, and Dong Yuan*

Estimation of Unmasked Face Images Based on Voice and 3DMM ..... 239  
*Tetsumaru Akatsuka, Ryohei Orihara, Yuichi Sei, Yasuyuki Tahara,  
and Akihiko Ohsuga*

Aging Contrast: A Contrastive Learning Framework for Fish Re-identification Across Seasons and Years ..... 252  
*Weili Shi, Zhongliang Zhou, Benjamin H. Letcher, Nathaniel Hitt, Yoichiro Kanno, Ryo Futamura, Osamu Kishida, Kentaro Morita, and Sheng Li*

Spatial Bottleneck Transformer for Cellular Traffic Prediction in the Urban City ..... 265  
*Hexuan Weng, Yanbin Liu, and Ling Chen*

MIDGET: Music Conditioned 3D Dance Generation ..... 277  
*Jinwu Wang, Wei Mao, and Miaomiao Liu*

**Machine Learning and Data Mining**

Minimum Message Length Inference of the Weibull Distribution with Complete and Censored Data ..... 291  
*Enes Makalic and Daniel F. Schmidt*

Multiple Teacher Model for Continual Test-Time Domain Adaptation ..... 304  
*Ran Wang, Hua Zuo, Zhen Fang, and Jie Lu*

Causal Disentanglement for Adversarial Defense ..... 315  
*Ji-Young Park, Lin Liu, Jixue Liu, and Jiuyong Li*

Gemini: A Dual-Task Co-training Model for Partial Label Learning ..... 328  
*Beibei Li, Senlin Shu, Beihong Jin, Tao Xiang, and Yiyuan Zheng*

Detecting Stress from Multivariate Time Series Data Using Topological Data Analysis ..... 341  
*Hieu Vu Tran, Carolyn McGregor, and Paul J. Kennedy*

Mining Label Distribution Drift in Unsupervised Domain Adaptation ..... 354  
*Peizhao Li, Zhengming Ding, and Hongfu Liu*

Automatic Classification of Sensors in Buildings: Learning from Time Series Data ..... 367  
*Mashud Rana, Ashfaqur Rahman, Mahathir Almashor, John McCulloch, and Subbu Sethuvenkatraman*

An Integrated Federated Learning and Meta-Learning Approach for Mining Operations ..... 379  
*Venkat Munagala, Sankhya Singh, Srikanth Thudumu, Irini Logothetis, Sushil Bhandari, Amit Bhandari, Kon Mouzakis, and Rajesh Vasa*



An Augmented Learning Approach for Multiple Data Streams Under  
 Concept Drift ..... 391  
*Kun Wang, Jie Lu, Anjin Liu, and Guangquan Zhang*

Sequence Unlearning for Sequential Recommender Systems ..... 403  
*Shanshan Ye and Jie Lu*

MPANet: Multi-scale Pyramid Attention Network for Collaborative  
 Modeling Spatio-Temporal Patterns of Default Mode Network ..... 416  
*Hang Yuan, Xiang Li, and Benzhenh Wei*

**Optimization**

Dynamic Landscape Analysis for Constrained Multiobjective Optimization  
 Problems ..... 429  
*Hanan Alsouly, Michael Kirley, and Mario Andrés Muñoz*

Finding Maximum Weakly Stable Matchings for Hospitals/Residents  
 with Ties Problem via Heuristic Search ..... 442  
*Son Thanh Cao, Le Van Thanh, and Hoang Huu Viet*

Approximating Solutions to the Knapsack Problem Using the Lagrangian  
 Dual Framework ..... 455  
*Mitchell Keegan and Mahdi Abolghasemi*

An Optimised Grid Search Based Framework for Robust Large-Scale  
 Natural Soundscape Classification ..... 468  
*Thomas Napier, Euijoon Ahn, Slade Allen-Ankins, and Ickjai Lee*

**Medical AI**

Interpretable 3D Multi-modal Residual Convolutional Neural Network  
 for Mild Traumatic Brain Injury Diagnosis ..... 483  
*Hanem Ellethy, Viktor Vegh, and Shekhar S. Chandra*

Comparative Assessment of Machine Learning Strategies  
 for Electrocardiogram Denoising ..... 495  
*Brenda Wang, Chirath Hettiarachchi, Hanna Suominen,  
 and Elena Daskalaki*

COVID-19 Fake News Detection Using Cross-Domain Classification  
 Techniques ..... 507  
*Arnav Sharma, Subhanjali Sharma, Utkarsh Bhardwaj, Sajib Mistry,  
 Novarun Deb, and Aneesh Krishna*

Context-Based Masking for Spontaneous Venous Pulsations Detection ..... 520  
*Hongwei Sheng, Xin Yu, Xue Li, and Mojtaba Golzan*

Beyond Model Accuracy: Identifying Hidden Underlying Issues in Chest  
X-ray Classification ..... 533  
*Richard Wainwright, Danny Wang, Harrison Layton,  
and Alina Bialkowski*

Enhance Reading Comprehension from EEG-Based Brain-Computer  
Interface ..... 545  
*Xinping Liu and Zehong Cao*

**Author Index** ..... 557