Sankalp Khanna Jian Cao Quan Bai Guandong Xu (Eds.)

PRICAI 2022: Trends in Artificial Intelligence

19th Pacific Rim International Conference on Artificial Intelligence PRICAI 2022, Shanghai, China, November 10–13, 2022 Proceedings, Part I





Lecture Notes in Computer Science 13629

Founding Editors

Gerhard Goos

Karlsruhe Institute of Technology, Karlsruhe, Germany

Juris Hartmanis

Cornell University, Ithaca, NY, USA

Editorial Board Members

Elisa Bertino

Purdue University, West Lafayette, IN, USA

Wen Gao

Peking University, Beijing, China

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Moti Yung

Columbia University, New York, NY, USA

More information about this series at https://link.springer.com/bookseries/558

Sankalp Khanna · Jian Cao · Quan Bai · Guandong Xu (Eds.)

PRICAI 2022: Trends in Artificial Intelligence

19th Pacific Rim International Conference on Artificial Intelligence PRICAI 2022, Shanghai, China, November 10–13, 2022 Proceedings, Part I



Editors
Sankalp Khanna C
CSIRO Australian e-Health Research Centre
Brisbane, QLD, Australia

Quan Bai D University of Tasmania Hobart, TAS, Australia Jian Cao

Shanghai Jiao Tong University Shanghai, China

Guandong Xu D University of Technology Sydney Sydney, NSW, Australia

ISSN 0302-9743 ISSN 1611-3349 (electronic) Lecture Notes in Computer Science ISBN 978-3-031-20861-4 ISBN 978-3-031-20862-1 (eBook) https://doi.org/10.1007/978-3-031-20862-1

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022

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 Switzerland AG The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

These three-volume proceedings contain the papers presented at the 19th Pacific Rim International Conference on Artificial Intelligence (PRICAI 2022), held as a hybrid conference with both physical and online options during November 10–13, 2022, in Shanghai, China.

PRICAI, which was inaugurated in Tokyo in 1990, started out as a biennial international conference concentrating on artificial intelligence (AI) theories, technologies, and applications in the areas of social and economic importance for Pacific Rim countries. It provides a common forum for researchers and practitioners in various branches of AI to exchange new ideas and share experience and expertise. Since then, the conference has grown, both in participation and scope, to be a premier international AI event for all major Pacific Rim nations as well as countries from all around the world. In 2018, the PRICAI Steering Committee decided to hold PRICAI on an annual basis starting from 2019.

This year, we received an overwhelming number of valid submissions to the main track (403 submissions), the special track (18 submissions), and the industry track (11 submissions). This number was impressive considering the continuing COVID-19 pandemic situation around the globe. All submissions were reviewed and evaluated with the same highest quality standard through a double-blind review process.

Each paper received at least two reviews, with over 90% receiving three or more. During the review process, discussions among the Program Committee (PC) members in charge were carried out before recommendations were made, and, when necessary, additional reviews were sourced. Finally, the conference and program co-chairs read the reviews and comments and made a final calibration for differences among individual reviewer scores in light of the overall decisions. The entire Program Committee (including PC members, external reviewers, and co-chairs) expended tremendous effort to ensure fairness and consistency in the paper selection process.

Eventually, we accepted 91 regular papers and 39 short papers for oral presentation. This gives a regular paper acceptance rate of 21% and an overall acceptance rate of 30%.

The technical program consisted of three workshops and the main conference program. The workshops included the "Principle and practice of data and Knowledge Acquisition Workshop (PKAW 2022)," the "Decoding Models of Human Emotion Using Brain Signals Workshop", and the "The 1st International Workshop on Democracy and AI (DemocrAI2022)". The main program included an industry track and a special track on "Strong and General AI."

All regular and short papers were orally presented over four days in parallel and in topical program sessions. We were honored to have keynote presentations by four distinguished researchers in the field of AI whose contributions have crossed discipline boundaries: Toby Walsh (University of New South Wales, Australia), Qing Li (Hong Kong Polytechnic University, China), Jie Lu (University of Technology Sydney, Australia), and Yu Zheng (JD Technology, China). We were grateful to them for sharing their insights on their latest research with us.

vi

The success of PRICAI 2022 would not be possible without the effort and support of numerous people from all over the world. First, we would like to thank the authors, PC members, and external reviewers for their time and efforts spent in making PRICAI 2022 a successful and enjoyable conference. We are also thankful to various fellow members of the conference committee, without whose support and hard work PRICAI 2021 could not have been successful:

 Advisory Board: Abdul Sattar, Beyong Kang, Takayuki Ito, Zhihua Zhou, Chengqi Zhang, and Fenrong Liu

- Special Track Chairs: Ji Zhang and Biao Wang

- Industry Chair: Hengshu Zhu

Workshop Chairs: Ryuta Arisaka and Zehong CaoTutorial Chairs: Weiwei Yuan and Rafik Hadfi

- Finance Chair: Shiyou Qian

- Local/Virtual Organizing Chairs: Shiyou Qian and Nengjun Zhu

- Publicity Chairs: Yi Yang and Mukesh Prasad

- Sponsorship Chairs: Dengji Zhao and Xiangfeng Luo

- Webmaster: Shiqing Wu

We gratefully acknowledge the organizational support of several institutions including the University of Tasmania (Australia), the University of Technology Sydney (Australia), Shanghai Jiao Tong University (China), CSIRO (Australia), Griffith University (Australia), Kyoto University (Japan), Shanghai Tech University (China), the University of South Australia (Australia), Nanjing University of Aeronautics and Astronautics (China), Shanghai University (China), Hefei University of Technology (China), the University of Southern Queensland (Australia), and the Shanghai Computer Society (China). Finally, we thank the team at Springer for their assistance in publishing the PRICAI 2022 proceedings as three volumes of its Lecture Notes in Artificial Intelligence series.

November 2022

Sankalp Khanna Jian Cao Quan Bai Guandong Xu

Organization

PRICAI Steering Committee

Steering Committee

Hideyuki Nakashima (Chair) Future University Hakodate, Japan

Zhi-Hua Zhou (Vice-chair) Nanjing University, China Abdul Sattar (Treasurer) Griffith University, Australia

Sankalp Khanna (Secretary) CSIRO Australian e-Health Research Centre,

Australia

Quan Bai University of Tasmania, Australia

Tru Hoang Cao Ho Chi Minh City University of Technology,

Vietnam

Xin Geng Southeast University, China

Guido Governatori Singapore Management University, Singapore

Takayuki Ito Kyoto University, Japan
Fenrong Liu Tsinghua University, China
Byeong Ho Kang University of Tasmania, Australia
M. G. M. Khan University of the South Pacific, Fiji
Dickson Lukose Monash University, Australia
Abhaya Nayak Macquarie University, Australia

Duc Nghia Pham MIMOS Berhad, Malaysia

Alok Sharma RIKEN, Japan, and University of the South

Pacific, Fiji

Kyung Hee University, South Korea

Thanaruk Theeramunkong Thammasat University, Thailand

Honorary Members

Seong-Bae Park

Randy Goebel University of Alberta, Canada

Tu-Bao Ho Japan Advanced Institute of Science and

Technology, Japan

Mitsuru Ishizuka University of Tokyo, Japan Hiroshi Motoda Osaka University, Japan Geoff Webb Monash University, Australia

Albert Yeap Auckland University of Technology, New Zealand

Byoung-Tak Zhang Seoul National University, South Korea Chengqi Zhang University of Technology Sydney, Australia

Conference Organizing Committee

General Chairs

Guandong Xu University of Technology Sydney, Australia

Quan Bai University of Tasmania, Australia

Program Chairs

Sankalp Khanna CSIRO Australian e-Health Research Centre,

Australia

Jian Cao Shanghai Jiao Tong University, China

Special Track Chairs

Ji Zhang University of Southern Queensland, Australia

Biao Wang Zhejiang Lab, China

Industry Chair

Hengshu Zhu Baidu Inc., China

Workshop Chairs

Ryuta Arisaka Kyoto University, Japan

Zehong Cao University of South Australia, Australia

Tutorial Chairs

Weiwei Yuan Nanjing University of Aeronautics and

Astronautics, China

Rafik Hadfi Kyoto University, Japan

Local and Virtual Conference Chairs

Shiyou Qian Shanghai Jiao Tong University, China

Nengjun Zhu Shanghai University, China

Finance Chair

Shiyou Qian Shanghai Jiao Tong University, China

Sponsorship Chairs

Dengji Zhao Shanghai Tech University, China Xiangfeng Luo Shanghai University, China

Publicity Chairs

Yi Yang Hefei University of Technology, China Mukesh Prasad University of Technology Sydney, Australia

Webmaster

Shiqing Wu University of Tasmania, Australia

Advisory Board

Abdul Sattar Griffith University, Australia
Byeong Kang University of Tasmania, Australia

Takayuki Ito Kyoto University, Japan Zhihua Zhou Nanjing University, China

Chengqi Zhang University of Technology Sydney, Australia

Fenrong Liu Tsinghua University, China

Program Committee

Eriko Aiba University of Electro-Communications, China Abdullah Alsuhaibani University of Technology Sydney, Australia

Patricia Anthony Lincoln University, New Zealand Mohammad Arshi Saloot MIMOS Berhad, Malaysia Mohamed Jaward Bah Zhejiang Lab, China

Quan Bai University of Tasmania, Australia Chutima Beokhaimook Rangsit University, Thailand

Ateet Bhalla Independent Technology Consultant, India Chih How Bong Universiti Malaysia Sarawak, Malaysia

Poonpong Boonbrahm Walailak University, Thailand

Aida Brankovic CSIRO Australian e-Health Research Centre,

Australia

Xiongcai Cai University of New South Wales, Australia
Jian Cao Shanghai Jiao Tong University, China
Jimmy Cao University of South Australia, Australia
Tru Cao University of Texas Health Science Center at

Houston, USA

Hutchatai Chanlekha Kasetsart University, Thailand Siqi Chen Tianjin University, China

Songcan Chen Nanjing University of Aeronautics and

Astronautics, China

Tony Chen University of Adelaide, Australia Wu Chen Southwest University, China

Yakun Chen University of Technology Sydney, Australia

Yingke Chen Sichuan University, China

Wai Khuen Cheng Universiti Tunku Abdul Rahman, Malaysia

Yihang Cheng Tianjin University, China

Boonthida Chiraratanasopha

Dan Corbett

Zhihong Cui

Célia da Costa Pereira

Jirapun Daengdej

Yala Rajabhat University, Thailand

University of Sydney, Australia

Shandong University, China

Université Côte d'Azur, France

Assumption University, Thailand

Abdollah Dehzangi Rutgers University, USA
Clare Dixon University of Manchester, UK

Zheng Dong Baidu Inc., China

Shyamala Doraisamy Universiti Putra Malaysia, Malaysia

Tri Duong University of Technology Sydney, Australia Shanshan Feng Shandong Normal University, China

Somehart Fugkeaw Thammasat University, Thailand

Katsuhide Fujita Tokyo University of Agriculture and Technology,

Japan

Naoki Fukuta Shizuoka University, China

Marcus Gallagher University of Queensland, Australia Dragan Gamberger Rudjer Boskovic Institute, Croatia

Xiaoying Gao Victoria University of Wellington, New Zealand

Xin Geng Southeast University, China Manolis Gergatsoulis Ionian University, Greece

Alban Grastien Australian National University, Australia Charles Gretton Australian National University, Australia

Jie Gui University of Michigan, USA Fikret Gurgen Boğaziçi University, Turkey Rafik Hadfi Kyoto University, Japan

Songqiao Han Shanghai University of Finance and Economics,

China

Bavly Hanna University of Technology Sydney, Australia
David Hason Rudd University of Technology Sydney, Australia
Hamed Hassanzadeh CSIRO Australian e-Health Research Centre,

Australia

Tessai Hayama Nagaoka University of Technology, Japan

Linlin Hou Zhejiang Lab, China

Juhua Hu University of Washington, USA

Liang Hu University of Technology Sydney, Australia Jiwei Huang China University of Petroleum, Beijing, China

Xiaodi Huang Charles Sturt University, Australia Nguyen Duy Hung Thammasat University, Thailand

Huan Huo University of Technology Sydney, Australia

Van Nam Huynh Japan Advanced Institute of Science and

Technology (JAIST), Japan

Masashi Inoue Tohoku Institute of Technology, Japan
Md Rafiqul Islam University of Technology Sydney, Australia

Takayuki Ito Kyoto University, Japan

Sanjay Jain National University of Singapore, Singapore

Guifei Jiang Nankai University, China
Ting Jiang Zhejiang Lab, China
Yichuan Jiang Southeast University, China

Nattagit Jiteurtragool King Mongkut's University of Technology North

Bangkok, Thailand

Hideaki Kanai Japan Advanced Institute of Science and

Technology (JAIST), Japan

Ryo Kanamori Nagoya University, Japan

Natsuda Kaothanthong Thammasat University, Thailand

Jessada Karnjana National Electronics and Computer Technology

Center, Thailand

C. Maria Keet University of Cape Town, South Africa
Gabriele Kern-Isberner Technische Universitaet Dortmund, Germany
Nor Khalid Auckland University of Technology, New Zealand
Sankalp Khanna CSIRO Australian e-Health Research Centre,

Australia

Nichnan Kittiphattanabawon Walailak University, Thailand

Sébastien Konieczny CRIL - CNRS, France

Alfred Krzywicki University of Adelaide, Australia
Li Kuang Central South University, China
Young-Bin Kwon Chung-Ang University, South Korea

Ho-Pun Lam Data61, CSIRO, Australia

Nasith Laosen Phuket Rajabhat University, Thailand

Siddique Latif University of Southern Queensland, Australia

Roberto Legaspi KDDI Research, Inc., Japan
Gang Li Deakin University, Australia
Guangliang Li Ocean University of China, China
Qian Li Chinese Academy of Sciences, China
Tianrui Li Southwest Jiaotong University, China

Weihua Li
Yicong Li
Zihao Li
Chanjuan Liu
Auckland University of Technology, New Zealand
University of Technology Sydney, Australia
University of Technology Sydney, Australia
Dalian University of Technology, China

Guanfeng Liu Macquarie University, Australia

Hao Liu HKUST(GZ), China

Kangzheng Liu Huazhong University of Science and Technology,

China

Tun LuFudan University, ChinaDickson LukoseGCS Agile Pty. Ltd., AustraliaXiangfeng LuoShanghai University, ChinaHaiping MaAnhui University, China

Michael Maher Reasoning Research Institute, Australia
Xinjun Mao National University of Defense Technology,

China

Eric Martin University of New South Wales, Australia

Sanparith Marukatat NECTEC, Thailand

Michael Mayo University of Waikato, New Zealand

Qingxin Meng Nottingham University Business School, China

Nor Liyana Mohd Shuib Universiti Malaya, Malaysia M. A. Hakim Newton University of Newcastle, Australia

Phi Le Nguyen Hanoi University of Science and Technology,

Vietnam

Kouzou Ohara Aoyama Gakuin University, Japan Mehmet Orgun Macquarie University, Australia

Maurice Pagnucco University of New South Wales, Australia Songwen Pei University of Shanghai for Science and

Technology, China

Laurent PerrusselIRIT, Université de Toulouse, FranceBernhard PfahringerUniversity of Waikato, New ZealandJantima PolpinijMahasarakham University, Thailand

Thadpong Pongthawornkamol Kasikorn Business-Technology Group, Thailand Mukesh Prasad University of Technology, Sydney, Australia Shiyou Qian Shanghai Jiao Tong University, China

Chuan Qin Baidu, China Joel Quinqueton LIRMM, France

Teeradaj Racharak Japan Advanced Institute of Science and

Technology, Japan

Jessica Rahman Australian National University, Australia

Farid Razzak New York University, USA

Fenghui Ren University of Wollongong, Australia
Mark Reynolds University of Western Australia, Australia
Vahid Riahi CSIRO Australian e-Health Research Centre,

Australia

Kazumi Saito University of Shizuoka, Japan Chiaki Sakama Wakayama University, Japan

Nicolas Schwind National Institute of Advanced Industrial Science

and Technology (AIST), Japan

Lin Shang Nanjing University, China

Alok Sharma RIKEN, Japan

Dazhong Shen University of Science and Technology of China,

China

Chenwei Shi Tsinghua University, China

Kaize Shi University of Technology Sydney, Australia

Zhenwei Shi Beihang University, China

Soo-Yong Shin Sungkyunkwan University, South Korea

Yanfeng Shu CSIRO, Australia

Chattrakul Sombattheera Mahasarakham University, Thailand
Insu Song James Cook University, Australia
Markus Stumptner University of South Australia, Australia
Xing Su Beijing University of Technology, China
Xin Sun Catholic University of Lublin, Poland
Ying Sun The Hong Kong University of Science and

Technology (Guangzhou), China

Boontawee Suntisrivaraporn DTAC, Thailand

Thepchai Supnithi NECTEC, Thailand
David Taniar Monash University, Australia

Xiaohui Tao University of Southern Queensland, Australia

Yanyun Tao Soochow University, China

Mingfei Teng Rutgers University, USA
Michael Thielscher University of New South Wales, Australia

Satoshi Tojo Japan Advanced Institute of Science and

Technology (JAIST), Japan

Shikui Tu Shanghai Jiao Tong University, China Miroslav Velev Aries Design Automation, USA

Muriel Visani Hanoi University of Science and Technology,

Vietnam, and La Rochelle University, France

Nhi N. Y. Vo Royal Melbourne Institute of Technology

University, Vietnam

Biao Wang Zhejiang Lab, China

Chao Wang Guangzhou HKUST Fok Ying Tung Research

Institute, China

Hao Wang Nanyang Technological University, Singapore Xiangmeng Wang University of Technology, Sydney, Australia

Xinxhi Wang Shanghai University, China

Zhen Wang Zhejiang Lab, China

Xiao Wei Shanghai University, China
Paul Weng UM-SJTU Joint Institute, China
Yang Wenli University of Tasmania, Australia

Wayne Wobcke University of New South Wales, Australia

Sartra Wongthanavasu Khon Kaen University, Thailand Brendon J. Woodford University of Otago, New Zealand

Hongyue Wu Zhejiang University, China Ou Wu Tianjin University, China

Shiqing Wu University of Technology Sydney, Australia

Xing Wu Shanghai University, China

Xiaoyu Xia University of Southern Queensland, Australia Kaibo Xie University of Amsterdam, The Netherlands Dawei Xu University of Technology Sydney, Australia Guandong Xu University of Technology Sydney, Australia Ming Xu Xi'an Jiaotong-Liverpool University, China

Shuxiang Xu University of Tasmania, Australia

Zenghui Xu Zhejiang Lab, China

Hui Xue Southeast University, China

Kong Yan Nanjing University of Information, Science and

Technology, China

Bo Yang University of Science and Technology of China,

China

Chao Yang University of Technology, Sydney, Australia
Haoran Yang University of Technology Sydney, Australia
Wencheng Yang University of Southern Queensland, Australia
Yang Yang Nanjing University of Science and Technology,

China

Yi Yang Hefei University of Technology, China Roland Yap National University of Singapore, Singapore

Kenichi Yoshida University of Tsukuba, Japan

Dianer Yu University of Technology Sydney, Australia

Hang Yu Shanghai University, China Ting Yu Zhejiang Lab, China

Weiwei Yuan Nanjing University of Aeronautics and

Astronautics, China

Takaya Yuizono Japan Advanced Institute of Science and

Technology (JAIST), Japan

Du Zhang California State University, USA

Haijun Zhang Harbin Institute of Technology Shenzhen

Graduate School, China

Ji Zhang University of Southern Queensland, Australia
Le Zhang University of Science and Technology of China,

China

Min-Ling Zhang Southeast University, China

Qi Zhang University of Science and Technology of China,

China

Shichao Zhang Guangxi Normal University, China
Wen Zhang Beijing University of Technology, China
Xiaobo Zhang Southwest Jiaotong University, China

Xuyun Zhang Macquarie University, Australia

Yang Zhang Zhejiang Lab, China

Zili Zhang Deakin University, Australia Dengji Zhao ShanghaiTech University, China

Hongke Zhao Tianjin University, China

Ruilin Zhao Huazhong University of Science and Technology,

China

Sirui Zhao Southwest University of Science and Technology,

China

Yanchang Zhao CSIRO, Australia

Shuigeng Zhou Fudan University, China

Chen Zhu Baidu Talent Intelligence Center, China Guohun Zhu University of Queensland, Australia

Hengshu Zhu Baidu Inc., China

Nengjun Zhu Shanghai University, China Xingquan Zhu Florida Atlantic University, USA Guobing Zou Shanghai University, China

Additional Reviewers

Agyemang, Brighter Haiyang, Xia Li, Renjie Arisaka, Ryuta Han, Aiyang Li, Ruijun Bea, Khean Thye Hang, Jun-Yi Li, Shu Burgess, Doug He, Yifan Lin, Shuxia Liu, Xiaxue Cao, Zehong He, Zhengqi Chalothorn, Tawunrat Hu, Jianshu Liu, Yuxin Chandra, Abel Hu. Liang Ma, Zhongchen Hu, Mengting Chandra, Rohitash Malysiak, Kevin Mayer, Wolfgang Chen, Siqi Hu, Yuxuan Clifton, Marshall Ishikawa, Yuichi Meng, Qiang Colley, Rachael Jia, Binbin Mezza, Stefano Dawoud, Ahmed Jiang, Shan Mi, Yuxi Jiang, Yunpeng Delobelle, Jérôme Miao, Ran Dinh, Thi Ha Ly Jiang, Zhaohui Ming, Zuheng

Duan, Jiaang Khan, Naimat Ullah Mittelmann, Munyque Duchatelle, Théo Kliangkhlao, Mallika Muhammod, Rafsanjani

Effendy, Suhendry Konishi, Tatsuya Ngo, Courtney
Everaere, Patricia Kumar, Shiu Nguyen, Mau Toan
Feng, Shanshan Lai, Zhong Yuan Nguyen, Minh Hieu
Feng, Xuening Le, Van An Nguyen, Trong-Tung
Gao, Jianqi Leow, Steven Nguyen, Trung Thanh

Gao, Shang Li, Jinpeng Niu, Hao
Gao, Yi Li, Li Parker, Timothy
Geng, Chuanxing Li, Pengbo Pereira, Gean

xvi Organization

Pho, Ngoc Dang Khoa Pino Perez, Ramon Polpinij, Jantima Qian, Junqi Raboanary, Toky Hajatiana Rashid, Mahmood Ren, Yixin Riahi, Vahid Rosenberg, Manou Sahoh, Bukhoree Selway, Matt Sharma, Ronesh Shi, Jingli Shi, Kaize Song, Baobao Song, Zhihao Sun, Qisong Sun, Ruoxi

Takeda, Naoto

Tan, Hongwei Tang, Huaying Tang, Wei Tao, Yanyun Thao Nguyen, Truong Tran, Kim Dung Vo, Chau Wang, Deng-Bao Wang, Guodong Wang, Hui Wang, Mengyan Wang, Xinyu Wang, Zirui Wanyana, Tezira Wardah, Wafaa Wu, Yao Xia, Dawen Xia, Yewei Xiangru, Yu Xie, Kaibo Xu, Rongxin

Yang, Bo

Yang, Yang

Yang, Yikun Yang, Zhichao Yao, Naimeng Ye, Tangwei Yi, Fan Yin. Ze Yu, Guanbao Yu, Yongxin Yuan, Weiwei Zang, Hao Zhang, Chris Zhang, Jiaqiang Zhang, Qingyong Zhang, Sixiao Zhang, Tianyi Zhang, Yao Zhang, Yi-Fan Zhao, Jianing Zhou, Wei

Contents – Part I

Al Foundations/Decision Theory	
Fair Allocation with Special Externalities	3
Robust Weighted Partial Maximum Satisfiability Problem: Challenge to Σ_2^P -Complete Problem	17
Epistemic Logic via Distance and Similarity	32
Abstract Argumentation Goes Quantum: An Encoding to QUBO Problems Marco Baioletti and Francesco Santini	46
Diversification of Parallel Search of Portfolio SAT Solver by Search Similarity Index Yoichiro Iida, Tomohiro Sonobe, and Mary Inaba	61
Dagster: Parallel Structured Search with Case Studies Mark Alexander Burgess, Charles Gretton, Josh Milthorpe, Luke Croak, Thomas Willingham, and Alwen Tiu	75
Faster Optimistic Online Mirror Descent for Extensive-Form Games	90
Generalized 3-Valued Belief States in Conformant Planning	104
Clustering-Based Network Inference with Submodular Maximization Lulu Kong, Chao Gao, and Shuang Peng	118
Applications of AI	
A LiDAR Based Control Solution to Achieve High Precision in Autonomous Parking Yin Yu, Yu Dong, and Fan Thu	135

Multi-view Heterogeneous Temporal Graph Neural Network for "Click	
Farming" Detection Zequan Xu, Qihang Sun, Shaofeng Hu, Jiguang Qiu, Chen Lin, and Hui Li	148
Deep Forest with Sparse Topological Feature Extraction and Hash Mapping for Brain Network Classification Junwei Li and Junzhong Ji	161
COVID-19 Forecasting Based on Local Mean Decomposition and Temporal Convolutional Network Lulu Sun, Zhouming Liu, Choujun Zhan, and Hu Min	175
VMEKNet: Visual Memory and External Knowledge Based Network for Medical Report Generation	188
Detecting Video Anomalous Events with an Enhanced Abnormality Score Liheng Shen, Tetsu Matsukawa, and Einoshin Suzuki	202
Frequency Domain Based Learning with Transformer for Underwater Image Restoration	218
MMISeg: A Semi-supervised Segmentation Method Based on Mixup and Mutual Information for Cardiac MRI Segmentation	233
Dual-Stream Feature Fusion Network for Detection and ReID in Multi-object Tracking	247
A Novel Approach for Pill-Prescription Matching with GNN Assistance and Contrastive Learning Trung Thanh Nguyen, Hoang Dang Nguyen, Thanh Hung Nguyen, Huy Hieu Pham, Ichiro Ide, and Phi Le Nguyen	261
A Robust Lightweight Deepfake Detection Network Using Transformers Yaning Zhang, Tianyi Wang, Minglei Shu, and Yinglong Wang	275
A General Personality Analysis Model Based on Social Posts and Links	289

Deception Detection Towards Multi-turn Question Answering with Context Selector Network Yinan Bao, Qianwen Ma, Lingwei Wei, Ding Wang, Wei Zhou, and Songlin Hu	304
SIA-Unet: A Unet with Sequence Information for Gastrointestinal Tract Segmentation Rongguang Ye, Ranmin Wang, Yantong Guo, and Lei Chen	316
Co-contrastive Self-supervised Learning for Drug-Disease Association Prediction Zihao Gao, Huifang Ma, Xiaohui Zhang, Zheyu Wu, and Zhixin Li	327
Obj-SA-GAN: Object-Driven Text-to-Image Synthesis with Self-Attention Based Full Semantic Information Mining Ruijun Li, Weihua Li, Yi Yang, and Quan Bai	339
Data Mining and Knowledge Discovery	
APGKT: Exploiting Associative Path on Skills Graph for Knowledge Tracing Haotian Zhang, Chenyang Bu, Fei Liu, Shuochen Liu, Yuhong Zhang, and Xuegang Hu	353
Features Fusion Framework for Multimodal Irregular Time-series Events	366
A Multi-output Integration Residual Network for Predicting Time Series Data with Diverse Scales Hao Li, Mingjian Tang, Kewen Liao, and Jie Shao	380
PLAE: Time-Series Prediction Improvement by Adaptive Decomposition Jufang Duan, Yi Wang, and Wei Zheng	394
GMEKT: A Novel Graph Attention-Based Memory-Enhanced Knowledge Tracing	408
Dual-VIE: Dual-Level Graph Attention Network for Visual Information Extraction	422
Temporal Edge-Aware Hypergraph Convolutional Network for Dynamic Graph Embedding	435

with Non-normalized Information Distance in Experiments Takeru Araki, Yuan Luo, and Minyi Guo	450
The Time-Sequence Prediction via Temporal and Contextual Contrastive Representation Learning Yang-yang Liu and Jian-wei Liu	465
Managing Dataset Shift by Adversarial Validation for Credit Scoring	477
Linking Check-in Data to Users on Location-aware Social Networks	489
Robust Subspace Clustering Based on Latent Low-rank Representation with Weighted Schatten-p Norm Minimization	504
Evolutionary Computation/Optimisation	
Speeding up Genetic Programming Based Symbolic Regression Using GPUs	519
High-Dimensional Discrete Bayesian Optimization with Intrinsic Dimension Shu-Jun Li, Mingjia Li, and Hong Qian	534
Multi-objective Evolutionary Instance Selection for Multi-label Classification Dingming Liu, Haopu Shang, Wenjing Hong, and Chao Qian	548
An Investigation of Adaptive Operator Selection in Solving Complex Vehicle Routing Problem Jiyuan Pei, Yi Mei, Jialin Liu, and Xin Yao	562
Evolutionary Automated Feature Engineering	57 4
Author Index	587

Contents – Part II

Knowledge	Ren	resentation	and	Reasoning
I I I I I I I I I I I I I I I I I I I	- L-	or escircation	***	Itemouning

Moderately-Balanced Representation Learning for Treatment Effects with Orthogonality Information	3
Source-Free Implicit Semantic Augmentation for Domain Adaptation Zheyuan Zhang and Zili Zhang	17
Role-Oriented Network Embedding Method Based on Local Structural Feature and Commonality Liang Ge, Xiaofeng Ye, Yixuan Jia, and Qinhong Li	32
Dynamic Refining Knowledge Distillation Based on Attention Mechanism Xuan Peng and Fang Liu	45
Entity Representation by Neighboring Relations Topology for Inductive Relation Prediction	59
Entity Similarity-Based Negative Sampling for Knowledge Graph Embedding	73
Label Enhancement Using Inter-example Correlation Information	88
Link Prediction via Fused Attribute Features Activation with Graph Convolutional Network	102
Multi-subspace Attention Graph Pooling	l 14
Learning Temporal and Spatial Embedding for Temporal Knowledge Graph Reasoning	127

Natural Language Processing

M2FNet: Multi-granularity Feature Fusion Network for Medical Visual Question Answering	141
He Wang, Haiwei Pan, Kejia Zhang, Shuning He, and Chunling Chen	171
Noise-Robust Semi-supervised Multi-modal Machine Translation	155
SETFF: A Semantic Enhanced Table Filling Framework for Joint Entity and Relation Extraction Hao Li, Md Tauhidul Islam, Kehan Huangliang, Zugang Chen, Kaiyang Zhao, and Haixian Zhang	169
PEKIN: Prompt-Based External Knowledge Integration Network for Rumor Detection on Social Media Ziang Hu, Huan Liu, Kun Li, Yuhang Wang, Zongzhen Liu, and Xiaodan Zhang	183
Entity-Aware Social Media Reading Comprehension Hao Liu, Yu Hong, and Qiao-ming Zhu	197
Aspect-Based Sentiment Analysis via Virtual Node Augmented Graph Convolutional Networks	211
Bidirectional Macro-level Discourse Parser Based on Oracle Selection Longwang He, Feng Jiang, Xiaoyi Bao, Yaxin Fan, Weihao Liu, Peifeng Li, and Xiaomin Chu	224
Evidence-Based Document-Level Event Factuality Identification	240
Named Entity Recognition Model of Power Equipment Based on Multi-feature Fusion	255
Improving Abstractive Multi-document Summarization with Predicate-Argument Structure Extraction	268
A Structure-Aware Method for Cross-domain Text Classification	283

SICM: A Supervised-Based Identification and Classification Model for Chinese Jargons Using Feature Adapter Enhanced BERT	297
HS ² N: Heterogeneous Semantics-Syntax Fusion Network for Document-Level Event Factuality Identification	309
Pay Attention to the "Tails": A Novel Aspect-Fusion Model for Long-Tailed Aspect Category Detection	321
Choice-Driven Contextual Reasoning for Commonsense Question Answering Wenqing Deng, Zhe Wang, Kewen Wang, Xiaowang Zhang, and Zhiyong Feng	335
Implicit Discourse Relation Recognition Based on Multi-granularity Context Fusion Mechanism Yuxiang Lu, Yu Hong, Xiao Li, and GuoDong Zhou	347
Chinese Medical Named Entity Recognition Using External Knowledge Lin Zhang, Peichao Lai, Feiyang Ye, Ruixiong Fang, Ruiqing Wang, Jiayong Li, and Yilei Wang	359
Neural Networks and Deep Learning	
Trajectory Prediction with Heterogeneous Graph Neural Network	375
EEF1-NN: Efficient and EF1 Allocations Through Neural Networks	388
Weighted Adaptive Perturbations Adversarial Training for Improving Robustness Yan Wang, Dongmei Zhang, and Haiyang Zhang	402
Improved Network Pruning via Similarity-Based Regularization	416
Dynamic-GTN: Learning an Node Efficient Embedding in Dynamic	420
Graph with Transformer	430

ICDT: Incremental Context Guided Deliberation Transformer for Image	444
Captioning Xinyi Lai, Yufeng Lyu, Jiang Zhong, Chen Wang, Qizhu Dai, and Gang Li	444
Semantic-Adversarial Graph Convolutional Network for Zero-Shot Cross-Modal Retrieval Chuang Li, Lunke Fei, Peipei Kang, Jiahao Liang, Xiaozhao Fang, and Shaohua Teng	459
DAST: Depth-Aware Assessment and Synthesis Transformer for RGB-D Salient Object Detection	473
A Vehicle Re-ID Algorithm Based on Channel Correlation Self-attention and Lstm Local Information Loss Tiantian Qi, Song Qiu, Li Sun, Zhuang Liu, Mingsong Chen, and Yue Lyu	488
A Self-supervised Graph Autoencoder with Barlow Twins	501
Few-Shot Image Classification Method Based on Fusion of Important Features of Different Scales Wu Zeng, Hengliang Zhu, Linkai Chen, Guangda Xu, and Shihao Zhao	513
Group Residual Dense Block for Key-Point Detector with One-Level Feature Jianming Zhang, Jia-Jun Tao, Li-Dan Kuang, and Yan Gui	525
Author Index	541

Contents – Part III

Recommende	er Sy	ystem

Mixture of Graph Enhanced Expert Networks for Multi-task	
Recommendation Binbin Hu, Bin Shen, Ruize Wu, Zhiqiang Zhang, Yuetian Cao, Yong He, Liang Zhang, Linjian Mo, and Jun Zhou	3
MF-TagRec: Multi-feature Fused Tag Recommendation for GitHub	17
Co-contrastive Learning for Multi-behavior Recommendation	32
Pattern Matching and Information-Aware Between Reviews and Ratings for Recommendation	46
Cross-View Contrastive Learning for Knowledge-Aware Session-Based Recommendation Xiaohui Zhang, Huifang Ma, Fanyi Yang, Zhixin Li, and Liang Chang	60
Reinforcement Learning	
HiSA: Facilitating Efficient Multi-Agent Coordination and Cooperation by Hierarchical Policy with Shared Attention	77
DDMA: Discrepancy-Driven Multi-agent Reinforcement Learning	91
PRAG: Periodic Regularized Action Gradient for Efficient Continuous Control Xihui Li, Zhongjian Qiao, Aicheng Gong, Jiafei Lyu, Chenghui Yu, Jiangpeng Yan, and Xiu Li	106
Identifying Multiple Influential Nodes for Complex Networks Based on Multi-agent Deep Reinforcement Learning	120
Online Learning in Iterated Prisoner's Dilemma to Mimic Human Behavior Baihan Lin, Djallel Bouneffouf, and Guillermo Cecchi	134

Optimizing Exploration-Exploitation Trade-off in Continuous Action	1 4 0
Spaces via Q-ensemble	148
Hidden Information General Game Playing with Deep Learning and Search Zachary Partridge and Michael Thielscher	161
Sequential Decision Making with "Sequential Information" in Deep	
Reinforcement Learning	173
Two-Stream Communication-Efficient Federated Pruning Network	185
Strong General AI	
Multi-scale Lightweight Neural Network for Real-Time Object Detection Yuan Li, Qiaojun Wu, Song Chen, and Yi Kang	199
Hyperspectral Image Classification Based on Transformer and Generative	
Adversarial Network Yajie Wang, Zhonghui Shi, Shengyu Han, and Zhihao Wei	212
Deliberation Selector for Knowledge-Grounded Conversation Generation	226
Training a Lightweight ViT Network for Image Retrieval	240
Vision and Perception	
Segmented-Original Image Pairs to Facilitate Feature Extraction in Deep	
Learning Models Yanqing Bi, Dong Li, and Yu Luo	253
FusionSeg: Motion Segmentation by Jointly Exploiting Frames and Events Lin Wang, Zhe Liu, Yi Zhang, Shaowu Yang, Dianxi Shi, and Yongjun Zhang	267
Weakly-Supervised Temporal Action Localization with Multi-Head	
Cross-Modal Attention	281

	Contents – Part III	XXV11
CrGAN: Continuous Rendering of Image Style		296
DPCN: Dual Path Convolutional Network for Single Image I Wenhao Zhang, Yue Zhou, Shukai Duan, and Xiaofang Hu	•	310
All up to You: Controllable Video Captioning with a Masked Zhen Yang and Lin Shang	Scene Graph	325
A Multi-Head Convolutional Neural Network with Multi-Pat Improves Image Denoising		338
Learning Spatial Fusion and Matching for Visual Object Trac Wei Xiao and Zili Zhang	king	352
Lightweight Wavelet-Based Transformer for Image Super-Re Jinye Ran and Zili Zhang	esolution	368
Efficient High-Resolution Human Pose Estimation		383
The Geometry Enhanced Deep Implicit Function Based 3D Refor Objects in a Real-Scene Image Haiwei Mei and Chenxing Wang		397
Multi-view Stereo Network with Attention Thin Volume Zihang Wan, Chao Xu, Jing Hu, Jian Xiao, Zhaopeng Me and Jitai Chen		410
3D Point Cloud Segmentation Leveraging Global 2D-View F Martin Pellon Consunji and Yutong Liu	eatures	424
Self-supervised Indoor 360-Degree Depth Estimation via Str Regularization		438
Global Boundary Refinement for Semantic Segmentation via Transport	o Optimal	452
Feng Dai, Shuaibin Zhang, Hao Liu, Yike Ma, and Qiang Z		
Optimization-based Predictive Approach for On-Demand Tra Keisuke Otaki, Tomoki Nishi, Takahiro Shiga, and Toshiki I	•	466

JointContrast: Skeleton-Based Mutual Action Recognition with Contrastive LearningLearning	478
Xiangze Jia, Ji Zhang, Zhen Wang, Yonglong Luo, Fulong Chen, and Jing Xiao	470
Nested Multi-Axis Learning Network for Single Image Super-Resolution Xianwei Xiao and Baojiang Zhong	490
Efficient Scale Divide and Conquer Network for Object Detection	504
Video-Based Emotion Recognition in the Wild for Online Education	
Systems Genting Mai, Zijian Guo, Yicong She, Hongni Wang, and Yan Liang	516
Real-world Underwater Image Enhancement via Degradation-aware Dynamic Network Haotian Qian, Wentao Tong, Pan Mu, Zheyuan Liu, and Hanning Xu	530
Self-Supervised Vision Transformer Based Nearest Neighbor Classification for Multi-Source Open-Set Domain Adaptation	542
Lightweight Image Dehazing Neural Network Model Based on Estimating Medium Transmission Map by Intensity Tian-Hu Jin, Yan-Yun Tao, Jia-Ren Guo, Zi-Hao Huang, and Jian-Yin Zheng	555
CMNet: Cross-Aggregation Multi-branch Network for Salient Object	
Detection	567
More Than Accuracy: An Empirical Study of Consistency Between	
Performance and Interpretability	579
Object-Scale Adaptive Optical Flow Estimation Network	591
A Task-Aware Dual Similarity Network for Fine-Grained Few-Shot	
Learning Yan Qi, Han Sun, Ningzhong Liu, and Huiyu Zhou	606

Contents – Pa	rt III xxix
Rotating Target Detection Based on Lightweight Network	619
Corner Detection Based on a Dynamic Measure of Cornerity Yang Zhang, Baojiang Zhong, and Xun Sun	631
Author Index	645