

## Professor (Research) Mengchu Zhou

Fellow of IEEE, IFAC, AAAS, CAA and NAI

Department of Engineering Science, Faculty of Innovation Engineering

Macau Institute of Systems Engineering

Macau University of Science and Technology



PhD. Supervisor

Tel.

E-mail [mczhou@must.edu.mo](mailto:mczhou@must.edu.mo)

### Academic Qualification:

- Ph. D. in Computer & Systems Eng., Rensselaer Polytechnic Institute, Troy, NY, 1990
- M. S. in Automatic Control, Beijing Institute of Technology, Beijing, China, 1986
- B. S. in Control Engineering, Nanjing Univ. of Sci. & Tech., Nanjing, China, 1983

### Teaching Area

- Intelligent Optimization
- Discrete even dynamic systems
- Sustainable Manufacturing Systems

### Research Area

- Intelligent automation
- Petri nets
- Robotics
- Internet of Things
- Big data analytics
- Cloud/edge computing
- Semiconductor manufacturing
- Artificial intelligence
- Intelligent transportation

### Working Experience

**September 2016 present:** Macau University of Science and Technology, Professor at the Department of Engineering Science and Macao Institute of Systems Engineering

**July 1990 present:** New Jersey Institute of Technology, ECE (Assistant Professor, Associate Professor, Professor and Distinguished Professor).

### Research Grants

Learning-based Intelligent Optimization Methods for Smart Warehousing in Logistics Industry, FDCT  
Modeling and Analysis of the Life Cycle of Disasters and Contingent Events via Big Data, FDCT  
Internet-oriented On-line Data Privacy Protection, PRC Ministry of Science and Technology

**Recent Books**

- [1] E.-S. M. El-Alfy, G. Bebis and M. Zhou, *Intelligent Image and Video Analytics*, CRC Press, New York, USA, 2023
- [2] L. Li and M. Zhou, *Sustainable Manufacturing Systems: An Energy Perspective*, IEEE Press/Wiley, Hoboken, NJ,

- Scheduling," *IEEE Trans. on Automation Science and Engineering*, vol. 19, no. 2, pp. 1137-1150, April 2022.
- [18] H. Yuan, J. Bi and M. Zhou, "Energy-Efficient and QoS-Optimized Adaptive Task Scheduling and Management in Clouds," *IEEE Trans. on Automation Science and Engineering*, vol. 19, no. 2, pp. 1233-1244, April 2022.
- [19] L. Hu, S. Yang, X. Luo, and M. Zhou "Algorithm of Inductively Identifying Clusters from Attributed *IEEE Trans. on Big Data*, vol. 8, no. 2, pp. 523-534, 1 April 2022.
- [20] B. Hu, S. Xu, Z. Cao and M. Zhou, "Safety-Guaranteed and Development Cost-Minimized Scheduling of DAG Functionality in an Automotive System," *IEEE Trans. on Intelligent Transportation Systems*, vol. 23, no. 4, pp. 3074- 3086, April 2022.
- [21] Advances and *IEEE/CAA Journal of Automatica Sinica*, vol. 9, no. 5, pp. 784-800, May 2022.
- [22] H. Wu, X. Luo and M. Zhou, "Advancing Non-Negative Latent Factorization of Tensors With Diversified Regularization Schemes," *IEEE Transactions on Services Computing*, vol. 15, no. 3, pp. 1334-1344, May-June 2022.
- [23] P. Huang, Z. Li, M. Zhou, X. Li and M. Cheng, "Enhanced Adaptive Admittance Control of a Wearable Walking Exoskeleton with Step Trajectory *IEEE Trans. on Fuzzy Systems*, vol. 30, no. 6, pp. 1541-1552, June 2022.
- [24] Neural Network and Particle Swarm Optimization," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 52, no.6, pp. 3746-3756, June 2022.
- [25] X. Mou, L. -X. Mao, H. -C. Liu and M. Zhou, "Spherical Linguistic Petri Nets for Knowledge Representation and Reasoning Under Large Group Environment," *IEEE Trans. on Artificial Intelligence*, vol. 3, no. 3, pp. 402-413, June 2022.
- [26] Z. Lei, S. Gao, Z. Zhang, M. Zhou and J. Cheng, "MO4: A Many-objective Evolutionary Algorithm for Protein Structure Prediction," *IEEE Trans. on Evolutionary Computation*, vol. 26, no. 3, pp. 417-430, June 2022.
- [27] X. Zhu, M. Zhou and A. Abusorrah, "Optimizing Node Deployment in Rechargeable Camera Sensor Networks for Full-View Coverage," *IEEE Internet of Things Journal*, vol. 9, no. 13, pp. 11396-11407, 1 July1, 2022.
- [28] E. Q. Wu, M. Zhou, D. Hu, L. Zhu, Z. Tang, X.-Y. Qiu, P.-Y. Deng, and L.-M. Zhu, "Self-Paced Dynamic Infinite Mixture Model for Fatigue Evaluation of Pilots' Brains," *IEEE Trans. on Cybernetics*, vol. 52, no. 7, pp. 5623-5638, July2022.
- [29] J. Bi, H. Yuan, J. Zhai " *IEEE/CAA Journal of Automatica Sinica*, vol. 9, no. 7, pp. 1284 1294, Jul. 2022.
- [30] M. Ghahramani, M. Zhou, A. Molter and F. Pilla, "IoT-Based Route Recommendation for an Intelligent Waste Management System," *IEEE Internet of Things Journal*, vol. 9, no. 14, pp. 11883-11892, 15 July15, 2022
- [31] M. Ghahramani, M. Zhou, Y. Qiao and N. Wu, "Spatiotemporal Analysis of Mobile Phone Network Based on Self- Organizing Feature Map," *IEEE Internet of Things Journal*, vol. 9, no. 13, pp. 10948-10960, 1 July1, 2022, doi: 10.1109/JIOT.2021.3127203.
- [32] H. Yuan, J. Bi and M. Zhou, "Geography-Aware Task Scheduling for Profit Maximization in Distributed Green Data Centers," in *IEEE Transactions on Cloud Computing*, vol. 10, no. 3, pp. 1864-1874, 1 July-Sept. 2022.
- [33] - -Divergence-Generalized Recommender for Highly Accurate Predictions of Missing User Preferences," *IEEE Trans. on Cybernetics*, vol. 52, no. 8, pp. 8006-8018, Aug. 2022.
- [34] M. Zhao, G. Xiong, M. Zhou, Z. Shen, S. Liu, Y. Han and F.-Y. Wang, "PCUNet: A Context-Aware Deep Network for Coarse-to-Fine Point Cloud Completion," *IEEE Sensors Journal*, vol. 22, no. 15, pp. 15098-15110, 1 Aug. 2022.
- [35] -free network-based differential evolution to *Swarm and Evolutionary Computation*, Vol. 74, 101142, doi.10.1016/j.swevo.2022.101142, 2022.
- [36] for machinery diagnostics and *Artificial Intelligence Review*, <https://doi.org/10.1007/s10462-022-10230-4>, Aug. 2022.
- [37] C. Wang, W. Pedrycz, Z. Li, and M. Zhou, "Leibler divergence based Fuzzy C-Means clustering incorporating *IEEE Transactions on Cybernetics*, vol. 52,no. 8, pp. 7612-7623, Aug. 2022.
- [38] M. Cui, L. Li, M. Zhou and A. Abusorrah, "Surrogate-assisted Autoencoder-embedded Evolutionary Optimization Algorithm to Solve High-dimensional Expensive Problems," *IEEE Trans. on Evolutionary Computation*, vol. 26, no. 4,pp. 676-689, Aug. 2022.
- [39] J. Luo, M. Zhou and J. -Q. Wang, "A Place-Timed Petri Net-Based Method to Avoid Deadlock and Conflict in Railway Networks," *IEEE Trans. on Intelligent Transportation Systems*, vol. 23,

- Augmented Variable Neighborhood Search Approach," *IEEE Trans. on Cybernetics*, vol. 52, no. 9, pp. 9797-9808, Sept. 2022.
- [42] B. Huang and M. Zhou, "Symbolic Scheduling of Robotic Cellular Manufacturing Systems With Timed Petri Nets," *IEEE Trans. on Control Systems Technology*, vol. 30, no. 5, pp. 1876-1887, Sept. 2022.
- [43] Fast -Tree-Initialized Dendritic Neuron Model for *IEEE Trans. on Neural Networks and Learning Systems*, vol. 33, no. 9, pp. 4173-4183, Sept. 2022.
- [44] Y. Zhou, W. Xu, Z. -H. Fu and M. Zhou, "Multi-Neighborhood Simulated Annealing-Based Iterated Local Search for Colored Traveling Salesman Problems," *IEEE Trans. on Intelligent Transportation Systems*, vol. 23, no. 9, pp. 16072-16082, Sept. 2022.
- [45] J. Zhang, Y. Lu, L. Che and M. Zhou, "Moving-Distance-Minimized PSO for Mobile Robot Swarm," *IEEE Transactions on Cybernetics*, vol. 52, no. 9, pp. 9871-9881, Sept. 2022.
- [46] C. Lin, Z. Cao and M. Zhou, "Learning-Based Grey Wolf Optimizer for Stochastic Flexible Job Shop Scheduling," *IEEE Transactions on Automation Science and Engineering*, vol. 19, no. 4, pp. 3659-3671, Oct. 2022.
- [47] F. M. Shakiba, S. M. Azizi and M. Zhou, "A Transfer Learning-Based Method to Detect Insulator Faults of High-Voltage Transmission Lines via Aerial Images: Distinguishing Intact and Broken Insulator Images," in *IEEE Systems, Man, and Cybernetics Magazine*, vol. 8, no. 4, pp. 15-25, Oct. 2022.
- [48] D. Yao, L. Yang, X. Xiao and M. Zhou, "Velocity-Based Gait Planning for Underactuated Bipedal Robot on Uneven and Compliant Terrain," *IEEE Transactions on Industrial Electronics*, vol. 69, no. 11, pp. 11414-11424, Nov. 2022.
- [49] -population Cooperative Optimization Algorithm Assisted by an Autoencoder for Medium-scale Expensive *IEEE/CAA Journal of Automatica Sinica*, vol. 9, no. 11, pp. 1952-1966, Nov. 2022.
- [50] D. Wu, Y. He, X. Luo and M. Zhou, "A Latent Factor Analysis-Based Approach to Online Sparse Streaming Feature Selection," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 52, no. 11, pp. 6744-6758, Nov. 2022.
- 2021**
- [51] P. Zhang, S. Shu and M. Zhou, "Adaptive and Dynamic Adjustment of Fault Detection Cycles in Cloud Computing," *IEEE Trans. on Industrial Informatics*, vol. 17, no. 1, pp. 20-30, Jan. 2021.
- [52] -identification," *IEEE Trans. on Intelligent Transportation Systems*, 22(1), pp. 394-403, Jan. 2021.
- [53] G. Fortino, C. Savaglio, G. Spezzano, and M. Zhou, of Things as System of Systems: A Review of *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 1, pp. 223-236, Jan. 2021.
- [54] Y. Wang, S. Gao, M. Zhou and Y. Yu, "A multi-layered gravitational search algorithm for function optimization and real-world problems," *IEEE/CAA Journal of Automatica Sinica*, vol. 8, no. 1, pp. 94-109, January 2021.
- [55] -based cuckoo search algorithm to schedule a flexible job shop with sequencing *IEEE Trans. on Automation Science and Engineering*, vol. 18, no. 1 pp. 56-69, Jan. 2021.
- [56] X. Luo, Z. Liu, M. Shang and M. Zhou, "Highly-Accurate Community Detection via Pointwise Mutual Information- Incorporated Symmetric Non-negative Matrix Factorization," *IEEE Trans. on Network Science and Engineering*, vol. 8, no. 1, pp. 463-476, 1 Jan.-March 2021.
- [57] X. Luo, D. Wang, M. Zhou and H. Yuan, "Latent Factor-Based Recommenders Relying on Extended Stochastic Gradient Descent Algorithms," *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 2, pp. 916-926, Feb. 2021.
- [58] H. Han, W. Ma, M. Zhou, Q. Guo and A. Abusorrah, "A Novel Semi-Supervised Learning Approach to Pedestrian Reidentification," *IEEE Internet of Things Journal*, vol. 8, no. 4, pp. 3042-3052, Feb. 2021.
- [59] B. Huang, M. Zhou, C. Wang, A. Abusorrah and Y. Al-Turki, "Deadlock-free supervisor design for robotic manufacturing cells with uncontrollable and unobservable events," *IEEE/CAA Journal of Automatica Sinica*, 8(3), pp. 597-605, March 2021.
- [60] of *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, 51(3), pp. 1855-1868, March 2021.
- [61] Y. Qiao, S. Zhang, N. Wu, M. Zhou, Z. Li and T. Qu, "Efficient Approach to Failure Response of Process Module in Dual-Arm Cluster Tools With Wafer Residency Time Constraints," *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 3, pp. 1612-1629, March 2021.
- [62] P. Zhang, M. Zhou and Y. Kong, "A Double-Blind Anonymous Evaluation-Based Trust Model in Cloud Computing Environments," *IEEE Trans. on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 3, pp. 1805-1816, March 2021.
- [63] -negative Latent Factor Analysis for *IEEE Trans. on Big Data*, vol. 7, no. 1, pp. 227-240, March 2021.
- [64] J. Bi, H. Yuan, S. Duanmu, M. C. Zhou and A. Abusorrah, "Energy-optimized Partial Computation Offloading in Mobile- Edge Computing with Genetic Simulated-annealing-based Particle Swarm Optimization," *IEEE Internet of Things Journal*, vol. 8, no. 5, pp. 3774-3785, March 2021.
- [65] X. Xu, J. Li and M. Zhou, "Delaunay-Triangulation-Based Variable Neighborhood Search to Solve Large-Scale

- General Colored Traveling Salesman Problems," *IEEE Trans. on Intelligent Transportation Systems*, vol. 22, no. 3, pp. 1583- 1593, March 2021.
- [66] N. Yang, M. Zhou, B. Xia, X. Guo and L. Qi, "Inversion Based on a Detached Dual-Channel Domain Method for StyleGAN2 Embedding," *IEEE Signal Processing Letters*, vol. 28, pp. 553-557, March 2021, doi: 10.1109/LSP.2021.3059371.
- [67] B. Hu, Z. Cao and M. Zhou, "An Efficient RRT-based Framework for Planning Short and Smooth Wheeled Robot Motion under Kinodynamic Constraints," *IEEE Trans. on Industrial Electronics*, 68(4), pp. 3292-3302, April 2021.
- [68] C. Wang, W. Pedrycz, Z. Li, and M. Zhou, "Data-driven Fuzzy C-Means Clustering for Image Segmentation," *IEEE/CAA Journal of Automatica Sinica*, vol. 8, no. 4, pp. 876-889, April 2021.
- [69] H. Yuan, H. Liu, J. Bi, and M. Zhou, "Energy Cost-optimized Biobjective Task Scheduling for Green Data Center," *IEEE Trans. on Automation Science and Engineering*, 18(2), pp. 731-742, April 2021.
- [70] H. Yuan, H. Liu, J. Bi, and M. Zhou, "Energy Cost-optimized Biobjective Task Scheduling for Green Cloud Data Center," *IEEE Trans. on Automation Science and Engineering*, 18(2), pp. 817-830, April 2021.
- [71] X. Guo, M. Zhou, S. Liu., and L. Qi, "Energy Cost-optimized Biobjective Task Scheduling for Green Cloud Data Center," *IEEE Trans. on Auto. Sci. and Eng.*, 18(2), pp. 804-816, April 2021.

- 3919-3929, Sept. 2021.
- [90] Z. H. Huang, S. Yang  
Detection at the Edge: Review and New *Artificial Intelligence Review*, <https://doi.org/10.1007/s10462-021-10059-3>, Sept. 2021.
- [91] Z. Tan, C. Wang, C. Yan, M. Zhou and C. Jiang, "Protecting Privacy of Location-Based Services in Road Networks," *IEEE Trans. on Intelligent Transportation Systems*, vol. 22, no. 10, pp. 6435-6448, Oct. 2021.
- [92] Z. Cao, D. Zhang and M. Zhou, "Modeling and Control of Hybrid 3-D Gaits of Snake-Like Robots," *IEEE Trans. on Neural Networks and Learning Systems*, vol. 32, no. 10, pp. 4603-4612, Oct. 2021.
- [93] J. Luo, M. Zhou and J. -Q. Wang, "AB&B: An Anytime Branch and Bound Algorithm for Scheduling of Deadlock- Prone Flexible Manufacturing Systems," *IEEE Trans. on Automation Science and Engineering*, vol. 18, no. 4, pp. 2011-2021, Oct. 2021.
- [94] X. Zhu and M. Zhou, "Multiobjective Optimized Cloudlet Deployment and Task Offloading for Mobile-Edge Computing," *IEEE Internet of Things Journal*, vol. 8, no. 20, pp. 15582-15595, 15 Oct.15, 2021.
- [95] H. Yuan, J. Bi and M. Zhou, "Temporal Task Scheduling of Multiple Delay-Constrained Applications in Green Hybrid Cloud," *IEEE Transactions on Services Computing*, vol. 14, no. 5, pp. 1558-1570, 1 Sept.-Oct. 2021.
- [96] F. M. Shakiba and M. Zhou, "Novel Analog Implementation of a Hyperbolic Tangent Neuron in Artificial Neural Networks," *IEEE Trans. on Industrial Electronics*, vol. 68, no. 11, pp. 10856-10867, Nov. 2021.
- [97] Y. Qiao, M. Zhou, N. Wu, Z. Li and Q. Zhu, "Closing-Down Optimization for Single-Arm Cluster Tools Subject to Wafer Residency Time Constraints," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 11, pp.6792-6807, Nov. 2021.
- [98] Y. Feng, M. Zhou, F. Tian, C. -B. Yan and K. Xing, "Deadlock Prevention Controller for Automated Manufacturing Systems Modeled by S<sup>4</sup>PR," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 12, pp. 7403-7412, Dec. 2021.
- [99] S. Yang, Y. Wen, L. He, M. Zhou and A. Abusorrah, "Sparse Individual Low-Rank Component Representation for Face Recognition in the IoT-Based System," *IEEE Internet of Things Journal*, vol. 8, no. 24, pp. 17320-17332, 15 Dec. 2021.
- [100] C. Wang, W. Pedrycz, Z. Li, M. Zhou and S. S. Ge, "G-image Segmentation: Similarity-preserving Fuzzy C-Means with Spatial Information Constraint in Wavelet Space," *IEEE Trans. on Fuzzy Systems*, vol. 29, no. 12, pp. 3887-3898, Dec. 2021.

## Professional Certification and Awards

- 2022 Best Semiconductor Manufacturing Automation Paper in Application, Y. Qiao, M. Zhou, N. Wu, Z. Li and Q. Zhu, "Closing-Down Optimization for Single-Arm Cluster Tools Subject to Wafer Residency Time Constraints," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 51, no. 11, pp. 6792-6807, Nov. 2021, Technical Committee on Semiconductor Manufacturing Automation, IEEE Robotics & Automation Society.
- 2022 Top #89 in the world ranking and #58 in United States ranking among Top 1000 Scientists in Computer Science in the world, [Research.com](https://www.research.com) in its 2022 Edition
- 2021 Fellow, National Academy of Inventors (NAI)
- 2021 Co-Advisor, Best Student Paper Award, Zengmei Zhuo, Xin Luo, and MengChu Zhou, Learning Task-Enhanced Graph Convolutional Network Model for Highly-accurate Node Classification on Weakly Supervised *2021 IEEE International Conference on Smart Data Services*, September 5-11, 2021.
- 2020 Meritorious Service Award for meritorious and significant service to SMC as VP Conferences & Meetings and SMCS Secretary, IEEE Systems, Man, and Cybernetics Society
- 2020 Best Application Paper Award, H. Yuan, J. Bi and M. Zhou, "Energy Cost and Performance-Sensitive Bi-objective Scheduling of Tasks in Clouds," *2020 IEEE 17th International Conference on Networking, Sensing and Control (ICNSC)*, Nanjing, China
- 2020 Best Paper Award, Y. Wang, K. Plataniotis, J. Wang, M. Hou, M. Zhou, N. Howard, J. Peng, R. Huang, S. Patel, and D. Zhang, *Cognitive and Mathematical Foundations of Analytic Proc. of the 19th IEEE International Conference on Cognitive Informatics and Cognitive Computing -28, 2020.*
- 2020 Edison Patent Award (for the patent titled *Vacuum Distillation and Desalination*, **U.S Patent 10661194**), the Research & Development Council of New Jersey
- 2019 Excellence in Research Prize and Medal, New Jersey Institute of Technology 2019 Highly cited scholar in engineering by Web of Science/Clarivate Analytics 2018 Highly cited scholar in engineering by Web of Science/Clarivate Analytics
- 2018 Outstanding Researcher Award, Newark College of Engineering, New Jersey Institute of Technology
- 2018 M. *-temporal analysis of mobile phone data for interaction Proc. of 2018 IEEE 15th International Conference on Networking, Sensing and Control (ICNSC)*, Zhuhai, China, March 27-29, 2018 (Best Student Paper Award).

## Journal Editorship

1. Editor-in-Chief, IEEE/CAA Journal of Automatica Sinica, 2018-2022
2. Associate Editor, IEEE Internet of Things Journal, 2018-present
3. Associate Editor, Research, 2021-present
4. Editorial Advisory Board Member, Journal of Industrial Information Integration, 2020-present
5. Associate Editor, IEEE/CAA Journal of Automatica Sinica, 2014-2016
6. Deputy Editor-in-Chief, IEEE/CAA Journal of Automatica Sinica, 2017-2018
7. Editorial Board Member, Frontiers of Information Technology & Electronic Engineering, 2015-
8. Founding Editor, IEEE Press Book Series on Systems Science and Engineering, 2011-present
9. Editor, IEEE Trans. on Automation Science and Engineering, 2008-2013
10. Associate Editor, IEEE Trans. on Intelligent Transportation Systems, 2012-present
11. Associate Editor, IEEE Trans. on Automation Sciences and Engineering, 2004-2007
12. Associate Editor, IEEE Trans. on Industrial Informatics, 2006-2015
13. Associate Editor, IEEE Trans. on Systems, Man, and Cybernetics: Systems, 2013-2016, 2019-present
14. Associate Editor, IEEE Trans. on Systems, Man, and Cybernetics, Part A: Systems and Humans, 2003-2013
15. Associate Editor, IEEE Trans. on Systems, Man, and Cybernetics, Part B: Cybernetics, 2002-2005
16. Managing Editor, IEEE Trans. on Systems, Man, and Cybernetics, Part C: Review and Applications, 2005-2008,
17. Editor, International Journal of Intelligent Control and Systems, 1996-2004
18. Editor-in-Chief, International Journal of Intelligent Control and Systems, 2005-2011
19. AE, IEEE Trans. on Robotics and Automation, 1997-2000
20. Member of the Editorial Review Board, International Journal of Cognitive Informatics and Natural Intelligence, 2005-present
21. Member of the Editorial Board, Enterprise Information Systems, 2008-present
22. Member of the Editorial Advisory Board of the Advances in Cognitive Informatics and Natural Intelligence (ACINI) Book Series, IGI, [www.idea-group.com](http://www.idea-group.com), 2007-present
23. Editorial Board Member, Journal of Engineering and Applied Science, 2007-present.
24. Editorial Board Member, Journal of Zhejiang University-Science C (Computers and Electronics), (<http://www.zju.edu.cn/jzus/>), 2009-2014

## Personal Website