



Dr. Tan Zehan

Department of Cross-Border E-Commerce

Associate Professor | Doctoral supervisor

Biography

Dr. Zehan Tan is an Associate Professor and Senior Engineer with over 15 years of experience in Artificial Intelligence research and development. He earned his Ph.D. in Electronic Information from the School of Computer Science and Technology at Fudan University in 2024. His professional career includes significant industrial leadership at Gree Electric, where he served as a Controller Developer, Director of the Controller Department, and Director of the Big Data Center. Currently, he leads the Department of Digital Intelligence Technology and the Research Office at Macau Millennium College, where he oversees the Collaborative Laboratory for Multimodal Smart Health. His expertise spans the full pipeline from fundamental AI research to industrial application.

Working Experience

- Previously held positions at Zhuhai Gree Electric Appliances Co., Ltd. as Controller Designer, Director of the Controller Department, and Director of the Big Data Center.
- Currently serves as an Associate Professor in the Faculty of Digital Intelligence and Innovation at Macau Millennium College, responsible for teaching and research in Artificial Intelligence and Embodied Intelligence, as well as managing

the Multimodal Smart Health Collaborative Laboratory. Additionally serves as the Director of the Research Office and Head of the Department of Digital Intelligence Technology.

Education Background

- Central South University, School of Mechanical and Electrical Engineering, Mechanical and Electronic Engineering, Bachelor of Engineering, 1994.9–1998.7
- Huazhong University of Science and Technology, School of Automation, Control Theory and Engineering, Master of Engineering, 2010.9–2013.12
- Fudan University, School of Computer Science and Technology, Electronic and Information, Doctor of Engineering, 2018.9–2024.1

Research Interests

- Multimodal Large Models, Embodied Intelligence, Large EEG(Electroencephalogram) Models

Teaching Courses

- Computer Concepts and Applications,
- AI-Driven Information and Data Processing Software Applications,
- Python Programming,
- Frontiers of Digital Technology,
- Web Design and Production Technology

Social Service

- Expert, Guangdong Provincial Industrial Internet Expert Committee
- Member of the First Application Committee, Guangdong-Hong Kong-Macao

Greater Bay Area International Center for Applied Mathematics

- Member, Zhuhai Vocational Skills Training Course Standards Technical Committee
- Member of the Expert Committee, Industrial Internet Technology Application Research Institute of the Chinese Society for Vocational and Technical Education
- Corporate Mentor, School of Artificial Intelligence Industry, Jinan University
- Academic Member of the Academic Committee, Key Laboratory of Cantonese Corpus and Large Model Evaluation

Related Honors:

- Recipient of a National Second Prize (Product Lifecycle Management Based on Big Data Platform)
- Quality Technology Award Second Prize from the China Association for Quality (Application of IoT in Air Conditioning Big Data)
- Two Second Prizes for Guangdong Provincial Enterprise Management Modernization Innovation Results
- Two Second Prizes in the University Teachers' Teaching Metaverse Digital Technology Innovation Competition
- Mentored students to win awards in national and Macau competitions and received the Outstanding Instructor Award

Research Achievements

[1]Liu T, Tan Z, Xu C, et al. Study on deep reinforcement learning techniques for building energy consumption forecasting[J]. Energy and Buildings, 2020, 208: 109675. JCR-Q1

[2]Guo Y, Tan Z, Chen H, et al. Deep learning-based fault diagnosis of variable refrigerant flow air-conditioning system for building energy saving[J]. Applied Energy, 2018, 225: 732-745.JCR-Q1

- [3] Tan Z, Yang W, Wang Z. Reimagining 3d visual grounding: Instance segmentation and transformers for fragmented point cloud scenarios[C]//Proceedings of the 5th ACM International Conference on Multimedia in Asia. 2023: 1-7. CCF-C
- [4] Zhao, M., Nie, F., Wang, C., Li, X., Tan, Z., & Hu, H. (2026). Nonnegative Spectral Embedding Learning with Adaptive Neighbors for Multi-view Clustering. Neural Networks, 108537. JCR-Q1
- [5] Luo Y, Shen H, Cao X, Tan Z*, et al. Conversion of Siamese networks to spiking neural networks for energy-efficient object tracking[J]. Neural Computing and Applications, 2022, 34(12): 9967-9982. JCR-Q2
- [6] Cao X, Luo Y, Xiao Y, Tan Z*, et al. Blind image super-resolution based on prior correction network[J]. Neurocomputing, 2021, 463: 525-534. JCR-Q1
- [7] Tan Z, Shen H. Lyapunov-based emotion-aware switching in hybrid human-artificial intelligence customer service systems[J]. Information Sciences, 2026: 123172. JCR-Q1
- [8] Tan Z, Zhao M, Wang Y, et al. Multivariate Time Series Retrieval with Binary Coding from Transformer[C]//International Conference on Neural Information Processing. Singapore: Springer Nature Singapore, 2022: 397-408. CCF-C
- [9] Tan Z, Yang W, Zhang Z. PyraBiNet: A Hybrid Semantic Segmentation Network Combining PVT and BiSeNet for Deformable Objects in Indoor Environments[C]//International Conference on Neural Information Processing. Singapore: Springer Nature Singapore, 2023: 552-564. CCF-C
- [10] Tan Z, Yang W, Li S, et al. Research on High-speed Object Tracking Based on Circle Migration Estimation Neighborhood[C]//2021 8th International Conference on Computational Science/Intelligence and Applied Informatics (CSII). IEEE, 2021: 29-33. EI
- [11] Tan Z, Wu Y, Shen H. RoboNavGuard: Lightweight Deformable Obstacle Segmentation and 3D Visual Grounding for Indoor Robot Navigation[J]. Machine Vision and Applications, 2026. DOI:<https://doi.org/10.21203/rs.3.rs-7809650/v1>. JCR-Q2
- [12] Tan Z, Yang W, Zhang Z. DOS Dataset: A Novel Indoor Deformable Object

Segmentation Dataset for Sweeping Robots[C]//International Conference on Neural Information Processing. Singapore: Springer Nature Singapore, 2023: 352-366. CCF-C

[13] Tan Z, Yang Y, Yang X, et al. AI in Tourism Education: A Review of AIGC Teaching and Evaluation Tools[C]//2025 11th International Conference on Education and Training Technologies (ICETT). IEEE, 2025: 71-79. EI

[14] Li S, Tan Z, Chen Y, et al. A Time Series Forecast Method for Vessel Trajectory Prediction[C]//2022 4th International Conference on Data-driven Optimization of Complex Systems (DOCS). IEEE, 2022: 1-6. EI

[15] Chen R, Xie J, Liu Y, et al. A novel complex network framework: Multi-span transition network with Riemann similarity measure[J]. Engineering Applications of Artificial Intelligence, 2026, 165: 113492. JCR-Q1

[16]An, Z., Ha, Y., Xing, L., Zhang, R., Li, X., Zhao, P., ... & Li, Z. (2026). Entropy-Driven Modulation Enables Co₃O₄-Based High-Entropy Oxides to Overcome Conductivity and Stability Limitations in Oxygen Evolution Reaction. Journal of Alloys and Compounds, 186356. JCR-Q1

Research Projects Led or Participated In

[1] Ministry of Science and Technology Project: Research and Application Demonstration of Zhuhai-Macau Collaborative Manufacturing Service Multi-Agent Coordination Platform. Served as the Project Leader for the collaborating party.

[2] China Foreign Languages Publishing Administration (CFLPA) Project: Research on the Technical Path and Application of Intelligent Disease Translation for Multilingual (Chinese-English-Portuguese-Cantonese) Patients in Macau. Served as a Core Developer.

Patent Applications There are 16 authorized and published invention patents as the primary inventor, with corresponding patent names and publication numbers as follows:

- [1] Autonomous mobile equipment and its method, apparatus, device, and storage medium — CN111880532B
- [2] Data processing method, apparatus, device, and computer-readable medium for sweepers — CN111839360B
- [3] A cleaning robot operation control method, apparatus, system, and storage medium — CN111528732B
- [4] A method, apparatus, server, and Bluetooth beacon for detecting the separation of a Bluetooth beacon from the body — CN111432338B
- [5] A generation method, apparatus, device, and storage medium for a working map — CN111248815B
- [6] Method, apparatus, and storage medium for liveness recognition — CN110674680B
- [7] Control switch and operating console — CN109068061B
- [8] Water flow detection method, apparatus, and system for water heater units — CN105202836B
- [9] A detection method for abnormal compressor operation and a compressor using the same — CN105626498B
- [10] Testing method, testing apparatus, testing tooling, and testing system for electronic equipment — CN103631246B
- [11] Testing tooling, testing system, and testing method for electrical equipment — CN103576019B
- [12] Data processing system and method for electronic expansion valve control detection — CN103424638B
- [13] Method and apparatus for testing communication loads — CN103376369B
- [14] Testing method for Modbus communication interface of a controller and the host computer — CN103376777B
- [15] An automated testing method and testing apparatus for air conditioning controllers — CN101727105B

[16] A double-sided book retrieval and return system and method for smart libraries
— CN202510117008

Book Publication

[1] Co-authored the book Refrigeration and Air Conditioning Meets Big Data (Industry Revolution), published by China Architecture & Building Press. ISBN: 9787112203994.

[2] Served as Associate Editor for the book Big Data Platform Construction, published by Xidian University Press. ISBN: 9787560669410.

News Reports

[1] Shimindaily: Macau Millennium College Shares Digital Teaching Practices with Teachers . https://mmc.edu.mo/blog/news_zh_hk/media_coverage_zh_hk/8084/ .

[2] Macau Millennium College Teachers and Students Win Third Prize in the "ICBC Cup" and the Outstanding Instructor Award
 . https://mmc.edu.mo/blog/news_zh_hk/home_news_zh_hk/8741/ .