DAI Bing Tian

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Education

PhD, National University of Singapore, Singapore, 2012

Bachelor of Computer Science, National University of Singapore, Singapore, 2004

Bachelor of Science, National University of Singapore, Singapore, 2004

Academic Appointments

Associate Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Jan 2025 - Present

Assistant Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Apr 2021 - Dec 2024

Assistant Professor of information Systems (Education), School of Computing and Information Systems, SMU, Oct 2016 - Mar 2021

Research Scientist, Living Analytics Research Centre, Singapore Management University, Singapore, Oct 2012 - Sep 2016

Research Fellow, School of Information Systems, Singapore Management University, Singapore, Mar 2012 - Sep 2012

Research Engineer, School of Information Systems, Singapore Management University, Singapore, Oct 2010 - Feb 2012

Research Assistant, School of Computing, National University of Singapore, Singapore, May 2009 - Sep 2010

Academic Administrative Positions

Director, MITB (Artificial Intelligence) Programme, SCIS PG by Course Work, SMU, Dec 2017 - Present

Other Positions and Affiliations

Intern, AT&T Labs-Research, United States of America, Jun 2006 - Oct 2006

Intern, AT&T Labs-Research, United States of America, May 2005 - Sep 2005

RESEARCH

Publications

Journal Articles [Refereed]

A comprehensive review of financial knowledge graphs, by JEYARAMAN, Brindha Priyadarshini; DAI, Bing Tian; FANG, Yuan. (2025). *World Scientific Annual Review of Artificial Intelligence, 3* 1-14. https://doi.org/10.1142/S2811032325300014 (Published)

Label correlated contrastive learning for medical report generation, by LIU, Xinyao; XIN, Junchang; DAI, Bing Tian; SHEN, Qi; HUANG, Zhihong; WANG, Zhiqiong. (2025). *Computer Methods and Programs in Biomedicine, 258* https://doi.org/10.1016/j.cmpb.2024.108482 (Published)

Multi-type attention for solving multi-depot vehicle routing problems, by LI, Jinqi; DAI, Bing Tian; NIU, Yunyun; XIAO, Jianhua; WU, Yaoxin. (2024). *IEEE Transactions on Intelligent Transportation Systems, 25* (11), 17831-17840. https://doi.org/10.1109/TITS.2024.3413077 (Published)

Temporal relational graph convolutional network approach to financial performance prediction, by JEYARAMAN, Brindha Priyadarshini; DAI, Bing Tian; FANG, Yuan. (2024). *Machine Learning and Knowledge Extraction, 6* (4), 2303-2320. https://doi.org/10.3390/make6040113 (Published)

Robust image classification system via cloud computing, aligned multimodal embeddings, centroids and neighbours, by KOH, Wei Lun; KOH, James Boon Yong; DAI, Bing Tian. (2024). *Machine Learning with Applications, 17* 1-25. https://doi.org/10.1016/j.mlwa.2024.100583 (Published)

Distance based image classification: A solution to generative classification's conundrum?, by LIN, Wen-Yan; LIU, Siying; DAI, Bing Tian; LI, Hongdong. (2022). *International Journal of Computer Vision,* 1-22. (Accepted)

A BERT-Based Two-Stage Model for Chinese Chengyu Recommendation, by TAN, Minghuan; JIANG, Jing; DAI, Bing Tian. (2021). *ACM Transactions on Asian and Low-Resource Language Information Processing, 20* (6), 1-18. https://doi.org/10.1145/3453185 (Published)

The gap of semantic parsing: A survey on automatic math word problem solvers, by ZHANG, Dongxiang; WANG, Lei; ZHANG, Luming; DAI, Bing Tian; SHEN, Heng Tao. (2020). *IEEE Transactions on Pattern Analysis and Machine Intelligence, 42* (9), 2287-2305. https://doi.org/10.1109/TPAMI.2019.2914054 (Published)

Optimized algorithms for predictive range and KNN queries on moving objects, by ZHANG, Rui; JAGADISH, H.V.; DAI, Bing Tian; RAMAMOHANARAO, Kotagiri. (2010). *Information Systems, 35* (8), 911-932. http://dx.doi.org/10.1016/j.is.2010.05.004 (Published)

Book Chapters

Learning analytics in informal, participatory collaborative learning, by CHEONG, Michelle L. F.; SINGH, Aditya V.; CHEN, Jean Y. C.; DAI, Bing Tian. (2023). In Tarek Rana, Alan Lowe, & Jan Svanberg (Ed.), *Handbook of big data and analytics in accounting and auditing* (pp. 439-462) Cham: Springer. https://doi.org/10.1007/978-981-19-4460-4_19 (Published)

Conference Proceedings

Usefulness and diminishing returns: Evaluating social information in recommender systems, by MENG, Qing; MIN, Huiyu; HEE, Ming Shan; LEE, Roy Ka-Wei; DAI, Bing Tian; XU, Shuai. (2025.0). *CIKM 2025: Proceedings of the 34th ACM International Conference on Information and Knowledge Management, Seoul, Korea, November 10-14,* (pp. 2105-2114) New York : ACM. https://dl.acm.org/doi/10.1145/3746252.3761168 (Published)

Fuel-saving route planning with data-driven and learning-based approaches: A systematic solution for harbor tugs, by WANG, Shengming; ZHANG, Xiaocai; LI, Jing; WEI, Xiaoyang; LAU, Hoong Chuin; DAI, Bing Tian; HUANG, Binbin Huang; XIAO, Zhe; FU, Xiuju; QIN, Zheng. (2024.0). *Proceedings of the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024): Jeju, South Korea, August 3-9,* (pp. 7483-7490) Jeju: IJCAI. https://doi.org/10.24963/ijcai.2024/828 (Published)

Effective graph kernels for evolving functional brain networks, by WANG, Xinlei; CHEN, Jinyi; DAI, Bing

Tian; XIN, Junchang; GU, Yu; YU, Ge. (2023.0). *WSDM '23: Proceedings of the 16th ACM International Conference on Web Search and Data Mining, Singapore, February 27-March 3,* (pp. 150-158) New York: ACM. https://doi.org/10.1145/3539597.3570449 (Published)

Effective graph kernels for evolving functional brain networks, by WANG, Xinlei; CHEN, Jinyi; DAI, Bing Tian; XIN, Junchang; GU, Yu; YU, Ge. (2023.0). *WSDM 2023: Proceedings of the 16th ACM International Conference on Web Search and Data Mining: Singapore, February 27-March 3,* (pp. 150-158) New York: ACM. https://doi.org/10.1145/3539597.3570449 (Published)

MWPToolkit: An open-source framework for deep learning-based math word problem solvers, by LAN, Yihuai; WANG, Lei; ZHANG, Qiyuan; LAN, Yunshi; DAI, Bing Tian; WANG, Yan; ZHANG, Dongxiang; LIM, Ee-Peng. (2022.0). *Proceedings of the 36th AAAI Conference on Artificial Intelligence, Virtual Conference, 2022 February 22 - March 1* , (pp. 13188-13190) Palo Alto, CA: AAAI Press. https://doi.org/10.1609/aaai.v36i11.21723 (Published)

Analysis of online posts to discover student learning challenges and inform targeted curriculum improvement actions, by CHEONG, Michelle L. F.; CHEN, Jean Y. C.; DAI, Bing Tian. (2020.0). *2020 IEEE International Conference on Teaching, Assessment and Learning for Engineering, TALE 2020: Virtual, December 8-11: Proceedings,* (pp. 774-779) Piscataway, NJ: IEEE. https://doi.org/10.1109/TALE48869.2020.9368343 (Published)

Modeling intra-relation in math word problems with different functional multi-head attentions, by LI, Jierui; WANG, Lei; ZHANG, Jipeng; WANG, Yan; DAI, Bing Tian; ZHANG, Dongxiang. (2019.0). *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics: Florence, July 28 - August 2,* (pp. 6162-6167) Florence: Association for Computational Linguistics. https://doi.org/10.18653/v1/P19-1619 (Published)

An intelligent platform with automatic assessment and engagement features for active online discussions, by CHEONG, Michelle L. F.; CHEN, Yun-Chen Jean; DAI, Bingtian. (2019.0). *Advances and Trends in Artificial Intelligence: 32nd International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems, IEA/AIE 2019, Graz, Austria, July 9-11, Proceedings,* (pp. 730-743) Cham: Springer. https://doi.org/10.1007/978-3-030-22999-3_62 (Published)

Online collaborative filtering with implicit feedback, by YIN, Jianwen; LIU, Chenghao; LI, Jundong; DAI, Bing Tian; CHEN, Yunchen; WU, Min; SUN, Jianling. (2019.0). *Database Systems for Advanced Applications: 24th International Conference, DASFAA 2019, Chiang Mai, Thailand, April 22-25, Proceedings,* (pp. 433-448) Cham: Springer. https://doi.org/10.1007/978-3-030-18579-4_26 (Published)

Template-based math word problem solvers with recursive neural networks, by WANG, Lei; ZHANG, Dongxiang; ZHANG, Jipeng; XU, Xing; GAO, Lianli; DAI, Bing Tian; SHEN, Heng Tao. (2019.0). *Proceedings of the 2019 AAAI Conference on Artificial Intelligence,* (pp. 7144-7151) Honolulu, USA: AAAI Press. https://doi.org/10.1609/aaai.v33i01.33017144 (Published)

Integrated telegram and web-based forum with automatic assessment of questions and answers for collaborative learning, by CHEONG, Michelle L.F.; CHEN, Jean Y. C.; DAI, Bing Tian. (2018.0). *Proceedings of IEEE International Conference on Teaching, Assessment and Learning for Engineering TALE 2018: Wollongong, Australia, 2018 December 4-7,* Piscataway, NJ: IEEE. https://doi.org/10.1109/TALE.2018.8615137 (Published)

Can I see beyond what you see? Blending machine learning and Econometrics to discover household TV viewing preferences, by LI, Zhuolun; KAUFFMAN,Robert John; DAI, Bing Tian. (2017.0). *Proceedings of the 50th Hawaii International Conference on Systems Science, Waikoloa Beach Drive, Waikoloa, 2017 January 4-7,* Washington, DC: IEEE Computing Society Press. (Published)

Did you expect your users to say this?: Distilling unexpected micro-reviews for venue owners, by CHONG, Wen-Haw; DAI, Bing Tian; LIM, Ee Peng. (2015.0). *HT '15: Proceedings of the 26th ACM Conference on Hypertext and Social Media: Guzelyurt, Northern Cyprus, September 1-4,* (pp. 13-22) New York: ACM. https://doi.org/10.1145/2700171.2791024 (Published)

Link prediction for bipartite social networks: The role of structural holes, by XIA, Shuang; DAI, Bing Tian; LIM, Ee Peng; ZHANG, Yong; XING, Chunxiao. (2012.0). *Advances in Social Networks Analysis and Mining (ASONAM 2012), Istanbul, Turkey, 2012, August 26-29,* Los Alamitos, Calif: IEEE Computer Society. http://www.worldcat.org/title/proceedings-of-the-2012-ieeeacm-international-conference-on-advances-in-social-networks-analysis-and-mining-26-29-august-2012-istanbul-turkey/oclc/839274524&referer=brief_results (Published)

Topic discovery from tweet replies, by DAI, Bingtian; LIM, Ee Peng; PRASETYO, Philips Kokoh. (2012.0). *Proceedings of the Workshop on Mining and Learning with Graphs (MLG-2012), Edinburgh, Scotland,* (pp. 1-8) Edinburgh: Katholieke Universiteit Leuven. https://dtai.cs.kuleuven.be/events/mlg2012/papers/6_Topic_Dai.pdf (Published)

Structural analysis in multi-relational social networks, by DAI, Bing Tian; CHUA, Freddy Chong Tat; LIM, Ee Peng. (2012.0). *Proceedings of the 2012 SIAM International Conference on Data Mining; California, USA, 2012 April 26-28,* (pp. 451-462) Philadelphia, Pennsylvania: Society for Industrial and Applied Mathematics. http://doi.org/10.1137/1.9781611972825.39 (Published)

Schema-as-you-go: on probabilistic tagging and querying of wide tables, by LU, Meiyu; AGRAWAL, Divyakant; DAI, Bing Tian; TUNG, Anthony K.H.. (2011.0). *Proceedings of the 2011 ACM SIGMOD International Conference on Management of data, Athens, Greece, 2011, June 12-16,* (pp. 181-192) New York, US: ACM. http://worldcat.org/isbn/9781450306614 (Published)

Estimating local optimums in EM algorithm over Gaussian mixture model, by ZHANG, Zhenjie; DAI, Bing Tian; TUNG, Anthony K.H.. (2008.0). *ICML '08: The 25th Annual International Conference on Machine Learning, Helsinki, Finland, July 5-9,* (pp. 1240-1247) New York: ACM. https://doi.org/10.1145/1390156.1390312 (Published)

Validating multi-column schema matchings by type, by DAI, Bing Tian; KOUDAS, Nick; SRIVASTAVA, Divesh; TUNG, Anthony K.H.; VENKATASUBRAMANIAN, Suresh. (2008.0). *IEEE 24th International Conference on Data Engineering 2008 ICDE: Cancun, Mexico, April 7-12: Proceedings,* (pp. 120-129) Piscataway, NJ: IEEE. https://doi.org/10.1109/ICDE.2008.4497420 (Published)

Column heterogeneity as a measure of data quality, by DAI, Bing Tian; KOUDAS, Nick; OOI, Beng Chin; SRIVASTAVA, Divesh; VENKATASUBRAMANIAN, Suresh. (2007.0). *Proceedings of the first international VLDB workshop on Clean Databases, Seoul, Korea, 2006 September 11,* (pp. 1-4) Stanford, CA: VLDB Endowment. (Published)

On the lower bound of local optimums in k-means algorithms, by ZHANG, Zhenjie; DAI, Bing Tian; TUNG, Anthony K.H.. (2006.0). *Proceedings of Sixth International Conference on Data Mining, Hong Kong, 2006, December 18-22,* (pp. 775-786) IEEE Computer Society: Los Alamitos. http://worldcat.org/OCLC/123503730 (Published)

Rapid identification of column heterogeneity, by DAI, Bing Tian; KOUDAS, Nick; OOI, Beng Chin; SRIVASTAVA, Divesh; VENKATASUBRAMANIAN, Suresh. (2006.0). *Proceedings of the 6th IEEE International Conference on Data Mining (ICDM 2006), Hong Kong, 2006, December 18-22,* (pp. 159-170) Los Alamitos, Calif: IEEE Computer Society. http://worldcat.org/OCLC/123503730 (Published)

Conference Papers

How Can Consumer Preferences Be Leveraged for Targeted Upselling in Cable TV Services?, by DAI, Bing Tian. (2014.0). *Pacific Telecommunications Council (PTC' 14),* Honolulu, Hawaii. (Presented)

Edited Conference Proceedings

Social informatics, edited by JATOWT, Adam; LIM, Ee Peng; DING, Ying; MIURA, Asako; TEZUKA, Taro; DIAS, Gael; TANAKA, Katsumi; FLANAGIN, Andrew J.; DAI, Bing Tian. (25/11/2013). Lecture Notes in Computer Science, 8238. Cham: Springer Verlag. http://doi.org/10.1007/978-3-319-03260-3 (Published)

Research Grants

Singapore Management University

AI-InterRAI: AI-Assisted InterRAI Assessment and Evaluation for Person-Centred Care Planning and Healthy Ageing, Singapore-New Zealand Joint Grant Call on Leveraging AI for Healthy Ageing, AI Singapore, National University of Singapore (NUS) , PI (Project Level): DAI Bing Tian , Co-PI (Project Level): TAN Kar Way, NGO Chong Wah, 2025, S$1,329,998.8

PresentationPro: Improving Public Speaking Skills through AI-Driven Virtual Reality Interactions, Tertiary Education Research Fund (TRF), Ministry of Education (MOE) , PI (Project Level): Kyong Jin SHIM , Co-PI

(Project Level): Swapna GOTTIPATI, Rajesh Krishna BALAN, DAI Bing Tian, 2024, S$144,302.2

Next-Gen Competitive Intelligence: Automated Discovery of Outstanding Facts with Large Language Models, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): LI Yuchen , Co-PI (Project Level): DAI Bing Tian, 2024, S$200,000

Adaptive and Intelligent Question-and-Answer Platform to Support Collaborative Learning, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): DAI Bing Tian , Co-PI (Project Level): Michelle CHEONG, DAI Bing Tian, 2017, S$149,354

<u>Other Institutions</u>

PresentationPro: Improving Public Speaking Skills through AI-Driven Virtual Reality Interactions, MOE TRF, MOE Tertiary Education Research Fund , PI (Programme Level): Kyong Jin SHIM, PI (Project Level): Kyong Jin SHIM, Co-PI (Project Level): Swapna GOTTIPATI, Rajesh Krishna BALAN, DAI Bing Tian, 2024, SGD144,302.2

Social Media Profile Analytics and Jobs Intelligence, Living Analytics Research Centre, DSO National Laboratories PI (Project Level): LIM Ee Peng, Co-PI (Project Level): DAI Bing Tian, SGD699,400

TEACHING

Courses Taught

<u>Singapore Management University</u>

Undergraduate Programmes :

    Design and Analysis of Algorithms

    Introduction to Machine Learning

Postgraduate Professional Programmes :

    Algorithm Design and Implementation

    Applied Machine Learning

    Computational Thinking with Python

    Deep Learning for Visual Recognition

    Machine Learning and Financial Applications

    Multi-Agent Systems

    Overseas Study Mission

    Project

    Python Programming and Data Analysis

Postgraduate Research Programmes :

    Empirical Research Project I

    Empirical Research Project II

Empirical Research Project III