

## **TAN Ah Hwee**

School of Computing and Information Systems  
Singapore Management University (SMU)  
80 Stamford Road  
Singapore 178902

Email: ahtan@smu.edu.sg

Office Phone: 6828 0022



### **Education**

PhD, Boston University, United States of America, 1994

Master of Science, National University of Singapore, Singapore, 1991

Bachelor of Science, National University of Singapore, Singapore, 1989

### **Academic Appointments**

Professor of Computer Science, School of Computing and Information Systems, SMU, Apr 2021 - Present

Professor of Information Systems, School of Computing and Information Systems, SMU, Mar 2020 - Mar 2021

Professor of Computer Science, School of Computer Science and Engineering, NTU, Singapore, Sep 2016 - Mar 2020

Associate Professor of Computer Science, School of Computer Science and Engineering, NTU (Tenured in April 2008), Singapore, Feb 2003 - Aug 2016

### **Academic Administrative Positions**

Jubilee Technology Fellow, School of Computing and Information Systems, SMU, Jul 2021 - Present

Associate Dean (Research), School of Computing and Information Systems, SMU, Jul 2020 - Present

Member, NTU Research Integrity Committee, Singapore, Sep 2017 - Feb 2020

Associate Chair (Research), School of Computer Science and Engineering, NTU, Singapore, Jan 2017 - Feb 2020

Member, NTU Teaching Council, Singapore, Aug 2016 - Feb 2020

Head of Division, Division of Software & Information Systems, School of Computer Engineering, NTU, Singapore, Jun 2011 - Jan 2014

Head of Division, Division of Information Systems, School of Computer Engineering, NTU, Singapore, Jun 2008 - May 2011

Director, Emerging Research Laboratories, School of Computer Engineering, NTU, Singapore, Dec 2004 - Aug 2008

### **Other Positions and Affiliations**

Technical Consultant, DSO National Laboratories, Singapore, Jan 2010 - Mar 2013

Faculty Associate, AStar Institute for Infocomm Research (concurrent appointment), Singapore, Mar 2006 - Feb 2008

Technical Consultant, AStar Institute for Infocomm Research (concurrent appointment), Singapore, Sep 2006 - Mar 2007

Visiting Professor, University of Melbourne (concurrent appointment), Australia, Dec 2004 - Jan 2005

Research Manager, Institute for Infocomm Research, Singapore, Nov 2002 - Feb 2003

Research Manager, Laboratories for Information Technology, Singapore, Jan 2002 - Nov 2002

Senior Member Research Staff, Kent Ridge Digital Laboratories, Singapore, Apr 1999 - Dec 2001

Member Research Staff, Kent Ridge Digital Laboratories, Singapore, Apr 1998 - Mar 1999

Associate Research Staff, Institute of Systems Science, Singapore, May 1994 - Mar 1998

Software Engineer, Institute of Systems Science, Singapore, Apr 1989 - May 1994

### **Awards and Honors**

Best Paper Award, The 4th IEEE International Conference on Agents, Jinan, China, 2019

Incoming Visiting Fellowship, Cardiff University, 2018

Best Paper Award, International Conference on Ageless Ageing, 2017

Divisional Innovation Award, DSO, 2016

Recognition of Service Award, ACM, 2015

Outstanding Service Award, Web Intelligence Consortium (WIC), 2015

Best Paper Award, 18th International Conference on MultiMedia Modelling, 2012

Exchange Fellowship in Engineering, Tan Chin Tuan, 2014, 2005

Gold Award, Optimal 2003 Exhibition of Innovations and Inventions, 2003

High Achiever Award, KRDL, 1999

Overseas Graduate Fellowship, National University of Singapore, 1990, 1991, 1992, 1993, 1994

Young Inventor Award (Silver), Tan Kah Kee, 1991

### **Professional Memberships**

Member, Web Intelligence (WI) Conference Steering Committee, 2016 - 2020

Member, Web Intelligence (WI) Technical Committee, 2016 - 2020

Member, IEEE Computational Intelligence Society, 2008 - 2020

Senior Member, IEEE, 2004 - 2020

### **RESEARCH**

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## Research and Project Areas

Cognitive and neural systems, brain-inspired computing, machine learning, knowledge discovery, text mining

## Publications

### Journal Articles [Refereed]

Spatial-temporal episodic memory modeling for ADLs: Encoding, retrieval, and prediction, by SONG, Xinjing; WANG, Di; Quek, Chai; TAN, Ah-Hwee; Wang, Yanjiang. (2023). *Complex & Intelligent Systems*, <https://doi.org/10.1007/s40747-023-01298-8> (Published)

Deep Reinforcement Learning With Explicit Context Representation, by Munguia-Galeano, Francisco; TAN, Ah-Hwee; JI, Ze. (2023). *IEEE Transactions on Neural Networks and Learning Systems*, 1-14. <https://doi.org/10.1109/TNNLS.2023.3325633> (Advance Online)

MSRL-Net: A Multi-level Semantic Relation-enhanced Learning Network for aspect-based sentiment analysis, by HU, Zhenda; WANG, Zhaoxia; WANG, Yinglin; TAN, Ah-Hwee. (2023). *Expert Systems with Applications*, 217 1-10. <https://doi.org/10.1016/j.eswa.2022.119492> (Published)

MiMuSA-mimicking human language understanding for fine-grained multi-class sentiment analysis, by WANG, Zhaoxia; HU, Zhenda; HO, Seng-Beng; CAMBRIA, Erik; TAN, Ah-Hwee. (2023). *Neural Computing and Applications*, 35 (21), 15907-15921. <https://doi.org/10.1007/s00521-023-08576-z> (Published)

Value-Based Subgoal Discovery and Path Planning for Reaching Long-Horizon Goals, by PATERIA, Shubham; SUBAGDJA, Budhitama; TAN, Ah-Hwee; QUEK, Chai. (2023). *IEEE Transactions on Neural Networks and Learning Systems*, 1-13. <https://doi.org/10.1109/TNNLS.2023.3240004> (Advance Online)

Aspect Sentiment Triplet Extraction Incorporating Syntactic Constituency Parsing Tree and Commonsense Knowledge Graph, by HU, Zhenda; WANG, Zhaoxia; WANG, Yinglin; TAN, Ah-Hwee. (2023). *Cognitive Computation*, 15 (1), <https://doi.org/10.1007/s12559-022-10078-4> (Published)

Predictive self-organizing neural networks for in-home detection of Mild Cognitive Impairment, by TEH, Seng Khoon; RAWTAER, Iris; TAN, Ah-Hwee. (2022). *Expert Systems with Applications*, 205 1-14. <https://doi.org/10.1016/j.eswa.2022.117538> (Published)

EEG-Video Emotion-Based Summarization: Learning With EEG Auxiliary Signals, by LEW, Wai-Cheong L.; WANG, Di; ANG, Kai-Keng; LIM, Joo-Hwee; QUEK, Chai; TAN, Ah-Hwee. (2022). *IEEE Transactions on Affective Computing*, 13 (4), 1-13. <http://doi.org/10.1109/TAFFC.2022.3208259> (Advance Online)

Real-Time Hierarchical Map Segmentation for Coordinating Multirobot Exploration, by LUO, Tianze; CHEN, Zichen; SUBAGDJA, Budhitama; TAN, Ah-Hwee. (2023). *IEEE Access*, 11 1-14. <http://doi.org/10.1109/ACCESS.2022.3171925> (Advance Online)

Who are the 'silent spreaders?': contact tracing in spatio-temporal memory models, by HU, Yue; SUBAGDJA, Budhitama; TAN, Ah-Hwee; QUEK, Chai; YIN, Quanjun. (2022). *Neural Computing and Applications*, 34 (17), 14859-14879. <https://doi.org/10.1007/s00521-022-07210-8> (Published)

Hierarchical control of multi-agent reinforcement learning team in real-time strategy (RTS) games, by ZHOU, Weigui Jiar; SUBAGDJA, Budhitama; TAN, Ah-Hwee; ONG Darren W. S.. (2021). *Expert Systems with Applications*, 186 1-44. <https://doi.org/10.1016/j.eswa.2021.115707> (Published)

End-to-End Hierarchical Reinforcement Learning With Integrated Subgoal Discovery, by PATERIA, Shubham; SUBAGDJA, Budhitama; TAN, Ah-Hwee; QUEK, Chai. (2022). *IEEE Transactions on Neural Networks and Learning Systems*, 33 (12), 1-13. <https://doi.org/10.1109/tnnls.2021.3087733> (Advance Online)

Vision-Based Topological Mapping and Navigation With Self-Organizing Neural Networks, by HU, Yue; SUBAGDJA, Budhitama; TAN, Ah Hwee; YIN, Quanjun. (2022). *IEEE Transactions on Neural Networks and Learning Systems*, 33 (12), 1-13. (Published)

- Hierarchical Reinforcement Learning: A Comprehensive Survey, by PATERIA, Shubham; SUBAGDJA, Budhitama; TAN, Ah Hwee; QUEK, Chai. (2021). *ACM Computing Surveys*, 54 (5), 1-35. (Published)
- Learning ADL Daily Routines with Spatiotemporal Neural Networks, by GAO, Shan; TAN, Ah-Hwee; SETCHI, Rossi. (2021). *IEEE Transactions on Knowledge and Data Engineering*, 33 (1), 143-153. <https://doi.org/10.1109/TKDE.2019.2924623> (Published)
- A systematic density-based clustering method using anchor points, by WANG, Yizhang; WANG, Di; MIAO, Chunyan; TAN, Ah-Hwee; ZHOU, You. (2020). *Neurocomputing*, 400 352-370. <https://doi.org/10.1016/j.neucom.2020.02.119> (Published)
- Goods Consumed During Transit in Split Delivery Vehicle Routing Problems: Modeling and Solution, by YANG, Wenzhe; WANG, Di; PANG, Wei; TAN, Ah-Hwee; ZHOU, You. (2020). *IEEE Access*, 8 110336-110350. <https://doi.org/10.1109/ACCESS.2020.3001590> (Published)
- McDPC: multi-center density peak clustering, by WANG, Yizhang; WANG, Di; ZHANG, Xiaofeng; PANG, Wei; MIAO, Chunyan; TAN, Ah-Hwee; ZHOU, You. (2020). *Neural Computing and Applications*, 32 (17), 1-19. <https://doi.org/10.1007/s00521-020-04754-5> (Published)
- Self-organizing neural networks for universal learning and multimodal memory encoding, by TAN, Ah-Hwee; SUBAGDJA, Budhitama; WANG, Di; MENG, Lei. (2019). *Neural Networks*, 120 58-73. <https://doi.org/10.1016/j.neunet.2019.08.020> (Published)
- Saliency-aware adaptive resonance theory for large-scale sparse data clustering, by MENG, Lei; TAN, Ah-Hwee; MIAO, Chunyan. (2019). *Neural Networks*, 120 143-157. <https://doi.org/10.1016/j.neunet.2019.09.014> (Published)
- CoRRN: Cooperative Reflection Removal Network, by WAN, Renjie; SHI, Boxin; LI, Haoliang; DUAN, Ling-Yu; TAN, Ah-Hwee; KOT, Alex C.. (2020). *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 42 (12), 2969-2982. <https://doi.org/10.1109/TPAMI.2019.2921574> (Published)
- REDPC: A residual error-based density peak clustering algorithm, by PARMAR, Milan; WANG, Di; ZHANG, Xiaofeng; TAN, Ah-Hwee; MIAO, Chunyan; JIANG, Jianhua; ZHOU, You. (2019). *Neurocomputing*, 348 82-96. <https://doi.org/10.1016/j.neucom.2018.06.087> (Published)
- Perception Coordination Network: A Neuro Framework for Multimodal Concept Acquisition and Binding, by XING, You-Lu; SHI, Xiao-Feng; SHEN, Fu-Rao; ZHAO, Jin-Xi; PAN, Jing-Xin; TAN, Ah-Hwee. (2019). *IEEE Transactions on Neural Networks and Learning Systems*, 30 (4), 1104-1118. <https://doi.org/10.1109/TNNLS.2018.2861680> (Published)
- A coordination framework for multi-agent persuasion and adviser systems, by SUBAGDJA, Budhitama; TAN, Ah-Hwee; KANG, Yilin. (2019). *Expert Systems with Applications*, 116 31-51. <https://doi.org/10.1016/j.eswa.2018.08.030> (Published)
- An interpretable neural fuzzy inference system for predictions of underpricing in initial public offerings, by WANG, Di; QIAN, Xiaolin; QUEK, Chai; TAN, Ah-Hwee; MIAO, Chunyan; ZHANG, Xiaofeng; NG, Geok See; ZHOU, You. (2018). *Neurocomputing*, 319 102-117. <https://doi.org/10.1016/j.neucom.2018.07.036> (Published)
- Region-Aware Reflection Removal With Unified Content and Gradient Priors, by WAN, Renjie; SHI, Boxin; DUAN, Ling-Yu; TAN, Ah-Hwee; GAO, Wen; KOT, Alex C.. (2018). *IEEE Transactions on Image Processing*, 27 (6), 2927-2941. <https://doi.org/10.1109/TIP.2018.2808768> (Published)
- Summarization of Egocentric Videos: A Comprehensive Survey, by GARCIA DEL MOLINO, Ana; TAN, Cheston; LIM, Joo-Hwee; TAN, Ah-Hwee. (2017). *IEEE Transactions on Human-Machine Systems*, 47 (1), 65-76. <https://doi.org/10.1109/THMS.2016.2623480> (Published)
- Towards autonomous behavior learning of non-player characters in games, by FENG, Shu; TAN, Ah-Hwee. (2016). *Expert Systems with Applications*, 56 (1), 89-99. <https://doi.org/10.1016/j.eswa.2016.02.043> (Published)
- Social context cognition crowd-sourcing and semi-automatic parametrization, by KOCHANOWICZ, Jaroslaw; TAN, Ah-Hwee; THALMANN, Daniel. (2016). *Computer Animation and Virtual Worlds*, 27 (3-4), 330-339. <https://doi.org/10.1002/cav.1718> (Published)
- Interactive Teachable Cognitive Agents: Smart Building Blocks for Multiagent Systems, by SUBAGDJA,

- Budhitama; TAN, Ah-Hwee. (2016). *IEEE Transactions on Systems, Man and Cybernetics: Systems*, 46 (12), 1724-1735. <https://doi.org/10.1109/TSMC.2016.2531656> (Published)
- Semantic Memory Modeling and Memory Interaction in Learning Agents, by WANG, Wenwen; TAN, Ah-Hwee; TEOW, Loo-Nin. (2017). *IEEE Transactions on Systems, Man and Cybernetics: Systems*, 47 (11), 47-11. <https://doi.org/10.1109/TSMC.2016.2531683> (Published)
- Adaptive Scaling of Cluster Boundaries for Large-Scale Social Media Data Clustering, by MENG, Lei; TAN, Ah-Hwee; WUNSCH, Donald C.. (2016). *IEEE Transactions on Neural Networks and Learning Systems*, 27 (12), 2656-2669. <https://doi.org/10.1109/TNNLS.2015.2498625> (Published)
- Neural modeling of sequential inferences and learning over episodic memory, by SUBAGDJA, Budhitama; TAN, Ah-Hwee. (2015). *Neurocomputing*, 161 229-242. <https://doi.org/10.1016/j.neucom.2015.02.038> (Published)
- Memes as building blocks: a case study on evolutionary optimization plus transfer learning for routing problems, by FENG, Liang; ONG, Yew-Soon; TAN, Ah-Hwee; TSANG, Ivor W.. (2015). *Memetic Computing*, 7 (3), 159-180. <https://doi.org/10.1007/s12293-015-0166-x> (Published)
- Dramaturgical and dissonance theories in explicit social context modeling for complex agents, by KOCHANOWICZ, Jaroslaw; TAN, Ah-Hwee; THALMANN, Daniel. (2015). *Computer Animation and Virtual Worlds*, 26 (3-4), 247-257. <https://doi.org/10.1002/cav.1639> (Published)
- Band selection for hyperspectral images using probabilistic memetic algorithm, by FENG, Liang; TAN, Ah-Hwee; LIM, Meng-Hiot; JIANG, Si Wei. (2016). *Soft Computing*, 20 (12), 4685-4693. <https://doi.org/10.1007/s00500-014-1508-1> (Published)
- Creating Autonomous Adaptive Agents in a Real-Time First-Person Shooter Computer Game, by WANG, Di; TAN, Ah-Hwee. (2015). *IEEE Transactions on Computational Intelligence and AI in Games*, 7(2), 123-138. <https://doi.org/10.1109/TCIAIG.2014.2336702> (Published)
- Self-Organizing Neural Networks Integrating Domain Knowledge and Reinforcement Learning, by TENG, Teck-Hou; TAN, Ah-Hwee; ZURADA, Jacek M.. (2015). *IEEE Transactions on Neural Networks and Learning Systems*, 26 (5), 889-902. <https://doi.org/10.1109/TNNLS.2014.2327636> (Published)
- Adaptive computer-generated forces for simulator-based training, by TENG, Teck-Hou; TAN, Ah-Hwee; TEOW, Loo-Nin. (2013). *Expert Systems with Applications*, 40 (18), 7341-7353. <https://doi.org/10.1016/j.eswa.2013.07.004> (Published)
- Semi-Supervised Heterogeneous Fusion for Multimedia Data Co-Clustering, by MENG, Lei; TAN, Ah-Hwee; XU, Dong. (2014). *IEEE Transactions on Knowledge and Data Engineering*, 26 (9), 2293-2306. <https://doi.org/10.1109/TKDE.2013.47> (Published)
- Cognitive architectures and autonomy: Commentary and response, by DUCH, Włodzisław; TAN, Ah-Hwee; FRANKLIN, Stan. (2012). *Journal of Artificial General Intelligence*, 3 (2), 31-63. <https://doi.org/10.2478/v10229-011-0016-2> (Published)
- Neural Modeling of Episodic Memory: Encoding, Retrieval, and Forgetting, by WANG, Wenwen; SUBAGDJA, Budhitama; TAN, Ah-Hwee; STARZYK, Janusz A.. (2012). *IEEE Transactions on Neural Networks and Learning Systems*, 23 (10), 1574-1586. <https://doi.org/10.1109/TNNLS.2012.2208477> (Published)
- A non-parametric visual-sense model of images-extending the cluster hypothesis beyond text, by WAN, Kong-Wah; TAN, Ah-Hwee; LIM, Joo-Hwee; CHIA, Liang-Tien. (2012). *Multimedia Tools and Applications*, 56 (3), 509-534. <https://doi.org/10.1007/s11042-010-0615-y> (Published)
- iFALCON: A neural architecture for hierarchical planning, by SUBAGDJA, Budhitama; TAN, Ah-Hwee. (2012). *Neurocomputing*, 86 124-139. <https://doi.org/10.1016/j.neucom.2012.01.008> (Published)
- Motivated learning for the development of autonomous systems, by STARZYK, Janusz A.; GRAHAM, James T.; RAI, Pawel; TAN, Ah-Hwee. (2012). *Cognitive Systems Research*, 14 (1), 10-25. <https://doi.org/10.1016/j.cogsys.2010.12.009> (Published)
- Extreme learning machine terrain-based navigation for unmanned aerial vehicles, by KAN, Ee May; LIM, Meng Hiot; ONG, Yew Soon; TAN, Ah-Hwee; YEO, Swee Ping. (2013). *Neural Computing and Applications*, 22 (3-4), 469-477. <https://doi.org/10.1007/s00521-012-0866-9> (Published)
- Preface: Trends in natural and machine intelligence, by CHAN, Jonathan H.; TAN, Ah-Hwee. (2012).

*Procedia Computer Science*, 13 1-6. <https://doi.org/10.1016/j.procs.2012.09.108> (Published)

Self-regulating action exploration in reinforcement learning, by TENG, Teck-Hou; TAN, Ah-Hwee; TAN, Yuan-Sin. (2012). *Procedia Computer Science*, 13 18-30. <https://doi.org/10.1016/j.procs.2012.09.110> (Published)

Cooperative reinforcement learning in topology-based multi-agent systems, by XIAO, Dan; TAN, Ah-Hwee. (2013). *Autonomous Agents and Multi-Agent Systems*, 26 (1), 86-119. <https://doi.org/10.1007/s10458-011-9183-4> (Published)

A hybrid agent architecture integrating desire, intention and reinforcement learning, by TAN, Ah-Hwee; ONG, Yew-Soon; TAPANUJ, Akejariyawong. (2011). *Expert Systems with Applications*, 38 (7), 8477-8487. <https://doi.org/10.1016/j.eswa.2011.01.045> (Published)

Creating an Immersive Game World with Evolutionary Fuzzy Cognitive Maps, by CAI, Yundong; TAN, Ah-Hwee; SHEN, Zhiqi; LI, Boyang. (2010). *IEEE Computer Graphics and Applications*, 30 (2), 58-70. <https://doi.org/10.1109/MCG.2009.80> (Published)

A self-organizing neural architecture integrating desire, intention and reinforcement learning, by TAN, Ah-Hwee; FENG, Yu-Hong; ONG, Yew-Soon. (2010). *Neurocomputing*, 73 (7-9), 1465-1477. <https://doi.org/10.1016/j.neucom.2009.11.012> (Published)

Wikipedia2Onto: Building concept ontology automatically, experimenting with web image retrieval, by WANG, Huan; JIANG, Xing; CHIA, Liang-Tien; TAN, Ah-Hwee. (2010). *Informatica*, 34 (3), 297-306. <https://www.informatica.si/index.php/informatica/article/view/304> (Published)

CRCTOL: A Semantic-Based Domain Ontology Learning System, by JIANG, Xing; TAN, Ah-Hwee. (2010). *Journal of the American Society for Information Science and Technology*, 61 (1), 150-168. <https://doi.org/10.1002/asi.21231> (Published)

Coherent Phrase Model for Efficient Image Near-Duplicate Retrieval, by HU, Yiqun; CHENG, Xiangang; CHIA, Liang-Tien; XIE, Xing; RAJAN, Deepu; TAN, Ah-Hwee. (2009). *IEEE Transactions on Multimedia*, 11 (8), 1434-1445. <https://doi.org/10.1109/TMM.2009.2032676> (Published)

Mining globally distributed frequent subgraphs in a single labeled graph, by JIANG, Xing; XIONG, Hui; WANG, Chen; TAN, Ah-Hwee. (2009). *Data & Knowledge Engineering*, 68 (10), 1034-1058. <https://doi.org/10.1016/j.datak.2009.04.008> (Published)

Learning and inferencing in user ontology for personalized Semantic Web search, by JIANG, Xing; TAN, Ah-Hwee. (2009). *Information Sciences*, 179 (16), 2794-2808. <https://doi.org/10.1016/j.ins.2009.04.005> (Published)

Integrated cognitive architectures: a survey, by CHONG, Hui-Qing; TAN, Ah-Hwee; NG, Gee-Wah. (2007). *Artificial Intelligence Review*, 28 (2), 103-130. <https://doi.org/10.1007/s10462-009-9094-9> (Published)

Learning Image-Text Associations, by JIANG, Tao; TAN, Ah-Hwee. (2009). *IEEE Transactions on Knowledge and Data Engineering*, 21 (2), 161-177. <https://doi.org/10.1109/TKDE.2008.150> (Published)

Learning Image-Text Associations, by JIANG, Tao; TAN, Ah-Hwee. (2009). *IEEE Transactions on Knowledge and Data Engineering*, 21 (2), 161-177. <https://doi.org/10.1109/TKDE.2008.150> (Published)

Modelling situation awareness for Context-aware Decision Support, by FENG, Yu-Hong; TENG, Teck-Hou; TAN, Ah-Hwee. (2009). *Expert Systems with Applications*, 36 (1), 455-463. <https://doi.org/10.1016/j.eswa.2007.09.061> (Published)

Explaining inferences in Bayesian networks, by YAP, Ghim-Eng; TAN, Ah-Hwee; PANG, Hwee Hwa. (2008). *Applied Intelligence*, 29 (3), 263-278. <https://doi.org/10.1007/s10489-007-0093-8> (Published)

A fast pruned-extreme learning machine for classification problem, by RONG, Hai-Jun; ONG, Yew-Soon; TAN, Ah-Hwee; ZHU, Zexuan. (2008). *Neurocomputing*, 72 (1-3), 359-366. <https://doi.org/10.1016/j.neucom.2008.01.005> (Published)

A fast pruned-extreme learning machine for classification problem, by RONG, Hai-Jun; ONG, Yew-Soon; TAN, Ah-Hwee; ZHU, Zexuan. (2008). *Neurocomputing*, 72 (1-3), 359-366. <https://doi.org/10.1016/j.neucom.2008.01.005> (Published)

Integrating temporal difference methods and self-organizing neural networks for reinforcement learning

with delayed evaluative feedback, by TAN, Ah-Hwee; LU, Ning; XIAO, Dan. (2008). *IEEE Transactions on Neural Networks*, 19 (2), 230-244. <https://doi.org/10.1109/TNN.2007.905839> (Published)

Self-organizing neural architectures and cooperative learning in a multiagent environment, by XIAO, Dan; TAN, Ah-Hwee. (2007). *IEEE Transactions on Systems, Man, and Cybernetics, Part B: Cybernetics*, 37 (6), 1567-1580. <https://doi.org/10.1109/TSMCB.2007.907040> (Published)

Discovering and exploiting causal dependencies for robust mobile context-aware recommenders, by YAP, Ghim-Eng; TAN, Ah-Hwee; PANG, Hwee Hwa. (2007). *IEEE Transactions on Knowledge and Data Engineering*, 19 (7), 977-992. <https://doi.ieeecomputersociety.org/10.1109/TKDE.2007.1065> (Published)

Mining generalized associations of semantic relations from textual Web content, by JIANG, Tao; TAN, Ah-Hwee; WANG, We. (2007). *IEEE Transactions on Knowledge and Data Engineering*, 19 (2), 164-179. <https://doi.org/10.1109/TKDE.2007.36> (Published)

Predictive neural networks for gene expression data analysis, by TAN, Ah-Hwee; PAN, Hong. (2005). *Neural Networks*, 18 (3), 297-306. <https://doi.org/10.1016/j.neunet.2005.01.003> (Published)

Towards personalised web intelligence, by TAN, Ah-Hwee; ONG, Hwee-Leng; PAN, Hong; NG, Jamie; LI, Qiu-Xiang. (2004). *Knowledge and Information Systems*, 6 (5), 595-616. <https://doi.org/10.1007/s10115-003-0130-9> (Published)

Modified ART 2A growing network capable of generating a fixed number of nodes, by HE, Ji; TAN, Ah-Hwee; TAN, Chew-Lim. (2004). *IEEE Transactions on Neural Networks*, 15 (3), 728-737. <https://doi.org/10.1109/TNN.2004.826220> (Published)

On machine learning methods for Chinese document classification, by HE, Ji; TAN, Ah-Hwee; TAN, Chew-Lim. (2003). *Applied Intelligence*, 18 (3), 311-322. <https://doi.org/10.1023%2FA%3A1023202221875> (Published)

Guest editorial: Text and web mining, by TAN, Ah-Hwee; YU, Philip S.. (2003). *Applied Intelligence*, 18 (3), 239-241. <https://doi.org/10.1023/A:1023219803219> (Published)

Organizing and personalizing intelligence gathering from the web, by ONG, Hwee-Leng; TAN, Ah-Hwee; NG, Jamie; HONG, Pan; LI, Qiu-Xiang. (2002). *Intelligent Systems in Accounting, Finance and Management*, 11 (1), 9-21. <https://doi.org/10.1002/isaf.208> (Published)

Cascade ARTMAP: Integrating neural computation and symbolic knowledge processing, by TAN, Ah-Hwee. (1997). *IEEE Transactions on Neural Networks*, 8 (2), 237-250. <https://doi.org/10.1109/72.557661> (Published)

Inductive neural logic network and the SCM algorithm, by TAN, Ah-Hwee; TEOH, Loo-Nin. (1997). *Neurocomputing*, 14 (2), 157-176. [https://doi.org/10.1016/S0925-2312\(96\)00032-X](https://doi.org/10.1016/S0925-2312(96)00032-X) (Published)

Concept Hierarchy Memory Model: A neural architecture for conceptual knowledge representation, learning, and commonsense reasoning, by TAN, Ah-Hwee; SOON, Hui-Shin Vivien. (1996). *International Journal of Neural Systems*, 7 (3), 305-319. <https://doi.org/10.1142/S0129065796000270> (Published)

Rule extraction: From neural architecture to symbolic representation, by CARPENTER, Gail A.; TAN, Ah-Hwee. (1995). *Connection Science*, 7 (1), 3-27. <https://doi.org/10.1080/09540099508915655> (Published)

ADAPTIVE RESONANCE ASSOCIATIVE MAP, by TAN, Ah-Hwee. (1995). *Neural Networks*, 8 (3), 437-446. [https://doi.org/10.1016/0893-6080\(94\)00092-Z](https://doi.org/10.1016/0893-6080(94)00092-Z) (Published)

Connectionist expert system with adaptive learning capability, by LOW, B. T.; LUI, Hochung; TAN, Ah-Hwee; TEH, Hoonheng. (1991). *IEEE Transactions on Knowledge and Data Engineering*, 3 (2), 200-207. <https://doi.org/10.1109/69.88000> (Published)

### Books (Refereed)

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## Book Chapters

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INSIDE: A connectionist case-based diagnostic expert system that learns incrementally, by LIM, Joo-Hwee; LUI, Ho-Chung; TAN, Ah-Hwee; TEH, Hoon-Heng. (1991.0). *Proceedings of 1991 International Joint Conference on Neural Networks, Singapore, November 18-21*, (pp. 1693-1698) Singapore: IEEE. (Published)

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### Conference Papers

A novel density peak clustering algorithm based on squared residual error, by PARMAR, Milan; WANG, Di;

TAN, Ah-Hwee; MIAO, Chunyan; JIANG, Jianhua; ZHOU, You. (2018.0). *2017 International Conference on Security, Pattern Analysis, and Cybernetics (SPAC), Shenzhen, China, December 15-18*, Shenzhen, China. <https://doi.org/10.1109/SPAC.2017.8304248> (Published)

### Edited Conference Proceedings

*Brain informatics and health - International Conference, BIH 2014, Warsaw, Poland, August 11-14, 2014*, edited by SLEZAK, Dominik; TAN, Ah-Hwee; PETERS, James F.; SCHWABE, Lars. (11/08/2014). Warsaw, Poland: Springer. (Published)

### Magazine Articles

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### **Other Outputs and Contributions**

#### Others

Personalized web image organization, by MENG, Lei; TAN, Ah-Hwee; WUNSCH, Donald C.. (2019). In (93-110). (Published)

Online multimodal co-indexing and retrieval of social media data, by MENG, Lei; TAN, Ah-Hwee; WUNSCH, Donald C. II. (2019). In *Adaptive resonance theory in social media data clustering* (155-174). (Published)

### **Research Grants**

#### Singapore Management University

Sensors In-Home for Elder Wellbeing (SINEW), Sengkang General Hospital Pte Ltd , PI (Project Level): TAN Ah Hwee, 2023, S\$116,500

Scalable and Explainable Intelligent Computer Generated Forces (iCGF), 0.0, DSO National Laboratories , PI (Project Level): TAN Ah Hwee, 2021, S\$904,280

TrustFUL: Trustworthy Federated Ubiquitous Learning, AI Singapore Research Programme, AI Singapore , Co-PI (Project Level): TAN Ah Hwee, 2021, S\$6,883,200

K-EMERGE: Knowledge Extraction, Modelling, and Explainable Reasoning for General Expertise, AME Programmatic Funds, Agency for Science, Technology and Research (A\*STAR) , PI (Project Level): TAN Ah Hwee, 2020, S\$5,997,000

Cognitive Information Systems, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): TAN Ah Hwee, 2020, S\$100,000

#### Other Institutions

Artificial Intelligence Programme for University Educators in Asia, NTU, Temasek Foundation International PI (Project Level): TAN Ah Hwee, 2019

AI@NTU, NTU, NTU/COE Tech Primer Grant PI (Project Level): TAN Ah Hwee, 2019

An end-to-end Adaptive AI-Assisted 3H Care (A3C) system, AI Singapore Grand Challenge, NTU, AI Singapore Co-PI (Project Level): TAN Ah Hwee, 2019, SGD4,609,920

Joint Situation Awareness and Collaborative Learning, NTU, STE-NTU Corp Lab PI (Project Level): TAN Ah Hwee, 2016

Boosting Learning and Memory for Cognitive Agility, NTU, DSO National Laboratories PI (Project Level): TAN Ah Hwee, 2016, SGD597,540

Towards Design and Implementation of Brain-Inspired Cognitive Systems, NTU, MOE AcRF Tier-1 PI (Project Level): TAN Ah Hwee, 2015

Computational Models for Human Multi-Memory Systems and Learning, NTU, DSO National Laboratories PI (Project Level): TAN Ah Hwee, 2015

Aging in Place, NTU, Joint NTU-UBC Research Center of Excellence in Active Living for the Elderly (LILY) PI (Project Level): TAN Ah Hwee, 2012

Constrained Flocking Animation & Modeling Research, NTU, MDA-GAMBIT R&D Programme Ong Yew Soon, Co-PI (Project Level): TAN Ah Hwee, 2010

A Co-Evolution Theory for Episodic and Semantic Memory, NTU, DSO National Laboratories PI (Project Level): TAN Ah Hwee, 2009

Agent-Augmented Co-Space: Growing Cognitive Autonomous Agents for Context-Aware Personalized Experience in Co-Space, NTU, Singapore National Research Foundation-Interactive Digital Media (NRF/MDA-IDM) R&D Programme PI (Project Level): TAN Ah Hwee, 2008

Next Generation Annotation Techniques for Consumer Photos and Videos, NTU, Singapore National Research Foundation-Interactive Digital Media (NRF/MDA-IDM) R&D Programme Xu Dong, Co-PI (Project Level): TAN Ah Hwee, 2008

Intelligent Agent-Augmented Multi-User Virtual Environments: Research into Designs for Learning Environments of the Future, NTU, Singapore National Research Foundation-Interactive Digital Media (NRF/MOE-IDM) R&D Programme Miao Chun Yan, Co-PI (Project Level): TAN Ah Hwee, 2008

Towards Integrated Neural Architectures for Memory Representation and Cognitive Information Processing, NTU, DSO National Laboratories PI (Project Level): TAN Ah Hwee, 2007

Cognitive Information Systems for Situation Awareness Modelling, Context-Aware Presentation and Knowledge Discovery, NTU, ST Dynamics and Intelligent Systems Centre's Programme on Intelligent Sensor Networks PI (Project Level): TAN Ah Hwee, 2005

Intelligent Technologies for Multimedia Information Fusion and Analysis, NTU, ASTAR I2R-SCE Joint Lab on Intelligent Media PI (Project Level): TAN Ah Hwee, 2005

Smart-Places: UWB-Enabled Context-Aware Service Environment, NTU, ASTAR SERC Thematic Pilot Programme on UWB and Pervasive Computing PI (Project Level): TAN Ah Hwee, 2004

## TEACHING

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### Teaching Areas

Artificial Intelligence, Neural Networks, Machine Learning, Data Mining and Analytics, Algorithms

### Courses Taught

Singapore Management University

Postgraduate Professional Programmes :

Text Analytics and Applications

## Postgraduate Research Programmes :

- Empirical Research Project 1
- Empirical Research Project 2
- Empirical Research Project 3
- Empirical Research Project 4

## THESES AND DISSERTATIONS

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### Theses and Dissertations Supervised

#### Other Institutions

Supervisor, "Neural Network Models for Human Activity Modeling and Analysis", Thesis by Gao Shan, Doctor of Philosophy, Nanyang Technological University, IGS, 2020

Supervisor, "Modeling Human-like Non-rationality in Social Agents", Thesis by Jarek Kochanowicz, Doctor of Philosophy, Nanyang Technological University, IMI, 2018

Supervisor, "Computational Methods for Modeling Human-Like Agents in Virtual Environment", Thesis by Kang Yilin, Doctor of Philosophy, Nanyang Technological University, 2015

Supervisor, "Computational Techniques for Modeling Non-Player Characters in Games", Thesis by Feng Shu, Doctor of Philosophy, Nanyang Technological University, 2015

Supervisor, "Self-Organizing Modeling of Multi-Memory System and Learning", Thesis by Wang Wenwen, Doctor of Philosophy, Nanyang Technological University, 2015

Supervisor, "Clustering and Heterogeneous Information Fusion for Social Media Theme Discovery and Associative Mining", Thesis by Meng Lei, Doctor of Philosophy, Nanyang Technological University, 2014

Supervisor, "Cognitive Information Systems for Context-Aware Decision Support", Thesis by Teng Teck Hou, Doctor of Philosophy, Nanyang Technological University, 2013

Supervisor, "Search Disambiguation Techniques in Multimedia Collections", Thesis by Wong Kong Wah, Doctor of Philosophy, Nanyang Technological University, 2012

Supervisor, "Methods and Systems for Ontology Learning, Exploitation, and Analysis", Thesis by Jiang Xing, Doctor of Philosophy, Nanyang Technological University, 2010

Supervisor, "Self-Organizing Neural Architectures and Multi-Agent Cooperative Reinforcement Learning", Thesis by Xiao Dan, Doctor of Philosophy, Nanyang Technological University, 2010

Supervisor, "Learning and Exploiting Context for Robust Recommendation", Thesis by Yap Ghim Eng, Doctor of Philosophy, Nanyang Technological University, 2009

Supervisor, "Web Multimedia Information Fusion and Analysis", Thesis by Jiang Tao, Doctor of Philosophy, Nanyang Technological University, 2008

### Theses and Dissertations Assessed

#### Other Institutions

Co Supervisor, "Multimodal Affective Computing for Video Summarization", Thesis by Lew Wai Cheong Lincoln, Doctor of Philosophy, Nanyang Technological University, 2023

Co Supervisor, "Visual Understanding and Personalization for an Optimal Recollection Experience", Thesis by Ana Garcia Del Molino, Doctor of Philosophy, Nanyang Technological University, 2020

External Examiner, "Modular Neural Networks", Thesis by Andrey Sakryukin, Doctor of Philosophy, National University of Singapore, 2020

Co Supervisor, "Single-Image Reflection Removal: From Computational Imaging to Deep Learning", Thesis by Wan Renjie, Doctor of Philosophy, Nanyang Technological University, IGS, 2019

Co Supervisor, "Agent Mediated Interactive Storytelling in Virtual Environment", Thesis by Cai Yundong, Doctor of Philosophy, Nanyang Technological University, 2011

Co Supervisor, "Machine Learning Methods for Pattern Analysis and Clustering", Thesis by He Ji, Doctor of Philosophy, National University of Singapore, 2004

## UNIVERSITY SERVICE

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### Singapore Management University

Committee Member, Reading and Recommendation Committee, Oct 2020 - Present

Committee Chair, Dean's Evaluation Committee, Jul 2020 - Jun 2021

Committee Member, School Evaluation Committee, May 2020 - Present

## EXTERNAL SERVICE – PROFESSIONAL

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Panel Chair, 2024 IEEE Conference on Artificial Intelligence (CAI 2024), IEEE Computational Intelligence Society, 2024

Area Chair, Technical Program Committee, The 33rd International Joint Conference on Artificial Intelligence (IJCAI-24), 2023 - 2024

Area Chair, Technical Program Committee, The 32nd International Joint Conference on Artificial Intelligence (IJCAI 2023), 2023

Editor Associate Editor, Computational Intelligence Magazine, IEEE, 2023

Chairperson, Singapore Chapter, IEEE Computational Intelligence Society, 2023

Committee Member, Neural Networks Technical Committee, IEEE Computational Intelligence Society, 2022 - 2023

Area Chair, Technical Program Committee, 30th International Joint Conference on Artificial Intelligence (IJCAI 2021), 2021

Member, Belt and Road Innovative Talent Exchange Foreign Expert Project, China University of Petroleum (East China), 2021 - 2022

Conference Chair, 2022 IEEE Conference Committee, 2022 IEEE Symposium Series on Computational Intelligence, 2020 - Present

Reviewer Book, Review Panel for SCS AI Ethics and Governance Book of Knowledge (BoK), Singapore Computer Society, 2020

Member Board of Advisors, International Scientific Board, Cardiff Centre for Artificial Intelligence, Robotics and Human-Machine Systems' (IROHMS), 2020 - Present

Reviewer Grant Proposal, Review Panel for Discovery Grant Proposals, Natural Sciences and Engineering Research Council of Canada (NSERC), 2019 - 2020

Editor Associate Editor, Editorial Board, IEEE Access, 2019 - Present

Editor Associate Editor, Frontiers in Big Data: Data Mining and Management, Frontiers, 2018 - Present

Editor Associate Editor, Editorial Board, IEEE Transactions on Neural Networks and Learning Systems, 2016 - 2021

Editorial Review Board Member, Web Intelligence, IOS Press, 2015 - Present

Editorial Review Board Member, Applied Soft Computing, Elsevier, 2013 - 2019

Editorial Review Board Member, IEEE ACCESS, 2013 - 2018

Editor Associate Editor, IEEE Transactions on Systems, Man and Cybernetics: Systems, 2013 - 2018

Reviewer Grant Proposal, External Review Committee, Hong Kong Research Grants Council, 2011 - Present

Editorial Review Board Member, Journal of Ambient Intelligence and Smart Environment, IOS Press, 2011 - Present

Editorial Review Board Member, Journal of Database Management, IGI Publishing, 2009 - Present

Editorial Review Board Member, Applied Intelligence, Springer, 1998 - Present

#### **EXTERNAL SERVICE – PUBLIC SECTOR AND COMMUNITY SERVICE**

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Member, Foundational Research Capabilities (FRC) Study Project Team, National Research Foundation, 2021 - 2022

Judge, Judge Panel, 2020 DIGIX Global AI Challenge, 2020 - Present