

Kiruthika RAMANATHAN

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Education

PhD, National University of Singapore, Singapore, 2007
Bachelor of Engineering, National University of Singapore, Singapore, 2003

Academic Appointments

Senior Lecturer of Information Systems, School of Computing and Information Systems, SMU, Jul 2024 - Present
Senior Lecturer of Computer Science, School of Computing and Information Systems, SMU, Jul 2022 - Jun 2024

Academic Administrative Positions

Director, MITB (Digital Transformation) Programme, SCIS PG by Course Work, SMU, Jul 2024 - Present
Faculty Manager, IS Project Experience (Applications), School of Computing and Information Systems, SMU, Jul 2022 - Present

Awards and Honors

Most Promising Teacher (Nominee), SMU Centre for Teaching excellence, 2024
Best Campaign Pivot (Bronze), Marketing Interactive, 2022
Best Event Led PR Campaign, Marketing Interactive, 2022
MOE Innergy Award, Ministry of Education, 2021
Intel AI Impact Shaper Award, Intel, 2021
MOE Innergy Award (Commendation), Ministry of Education, 2019
ASPAC Fellowship Award, Asia Pacific Network of Science and technology Centres, 2017
NUS Research Scholarship, National University of Singapore, 2003

RESEARCH

Publications

Journal Articles [Refereed]

Modeling neuromorphic persistent firing networks, by NING, Ning; LI, Guoqi; HE, Wei; HUANG, Kejie; PAN, Li; RAMANATHAN, Kiruthika; ZHAO, Rong; SHI, Luping. (2015). *International Journal of Intelligence Science*, 5 (2), 89-101. <http://doi.org/10.4236/ijis.2015.52009> (Published)

Behind the magical numbers: Hierarchical chunking and the human working memory capacity, by LI, Guoqi; NING, Ning; RAMANATHAN, Kiruthika; HE, Wei; PAN, Li; SHI, Luping. (2013). *International Journal of Neural Systems*, 23 (4), 1-12. <http://doi.org/10.1142/S0129065713500196> (Published)

Enabling an integrated rate-temporal learning scheme on memristor , by HE, Wei; HUANG, Kejie; NING, Ning; RAMANATHAN, Kiruthika; LI, Guoqi; JIANG, Yu; SZE, JiaYin; SHI, Luping; ZHAO, Rong; PEI, Jing. (2013). *Scientific Reports*, 4 (4755), 1-6. <https://doi.org/10.1038%2Fsrep04755> (Published)

Presynaptic learning and memory with a persistent firing neuron and a habituating synapse: A model of short term persistent habituation, by RAMANATHAN, Kiruthika; NING, Ning; DHANASEKAR, Dhiviya; LI, Guoqi; SHI, Luping; VADAKKEPAT, Prahlad. (2012). *International Journal of Neural Systems*, 22 (4), 1-20. <http://doi.org/10.1142/S0129065712500153> (Published)

Artificial cognitive memory-changing from density driven to functionality driven, by SHI, Luping; YI, Kaijun; RAMANATHAN, Kiruthika; ZHAO, Rong; NING, Ning; DING, Ding; CHONG, Tow Chong. (2011). *Applied Physics A: Materials Science and Processing*, 102 (4), 865-875. <http://doi.org/10.1007/s00339-011-6297-0> (Published)

Multiorder neurons for evolutionary higher-order clustering and growth, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei . (2007). *Neural Computation*, 19 (12), 3369-3391. <https://doi.org/10.1162/neco.2007.19.12.3369> (Published)

Clustering and combinatorial optimization in recursive supervised learning, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2007). *Journal of Combinatorial Optimization*, 13 (2), 137-152. <http://doi.org/10.1007/s10878-006-9017-5> (Published)

Multi-learner based recursive supervised training, by IYER, Laxmi R.; RAMANATHAN, Kiruthika; GUAN, Sheng-Uei. (2006). *International Journal of Computational Intelligence and Applications*, 6 (3), 1-33. <https://doi.org/10.1142/S1469026806001861> (Published)

Multi-learner based recursive supervised training, by IYER, Laxmi R.; RAMANATHAN, Kiruthika; GUAN, Sheng-Uei. (2006). *International Journal of Computational Intelligence and Applications*, 6 (3), 429-449. <https://doi.org/10.1142/S1469026806001861> (Published)

Journal Articles [Non-Refereed]

Memory Dynamics in Attractor Networks, by LI, Guoqi; RAMANATHAN, Kiruthika; NING, Ning; SHI, Luping; WEN, Changyun. (2015). *Computational Intelligence and Neuroscience*, 2015 1-7. <https://doi.org/10.1155/2015/191745> (Published)

Editorials

Guest editorial: Special issue on brain inspired models of cognitive memory, by TANG, Huajin; RAMANATHAN, Kiruthika; NIGN, Ning. (2014). *Neurocomputing*, 138 1-2. <https://doi.org/10.1016/j.neucom.2014.02.010> (Published)

Book Chapters

Recursive pattern based hybrid supervised training, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2008). In ABRAHAM, Ajith; GROSAN, Crina; PEDRYCZ, Witold (Ed.), *Engineering Evolutionary Intelligent Systems* (pp. 129-126) Germany: Springer. http://doi.org/10.1007/978-3-540-75396-4_5 (Published)

Single- and multi-order Neurons for recursive unsupervised learning, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2008). In VLAHAVAS, Ioannis; VRAKAS, Dimitris (Ed.), *Artificial Intelligence for Advanced*

Problem Solving Techniques <http://doi.org/10.4018/978-1-59904-705-8.ch008> (Published)

Enhancing recursive supervised learning using clustering and combinatorial optimization (RSL-CC), by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2008). In ABRAHAM, Ajith; GROSAN, Crina; PEDRYCZ, Witold (Ed.), *Engineering Evolutionary Intelligent Systems* (pp. 157-176) Germany: Springer. http://doi.org/10.1007/978-3-540-75396-4_6 (Published)

Conference Proceedings

Revised online learning with kernels for classification and regression, by LI, Guoqi; NING, Ning; RAMANATHAN, Kiruthika; SHI, Luping. (2013.0). *Proceedings of the 2013 IEEE Symposium on Computational Intelligence and Data Mining, Singapore, April 16-19*, Singapore: IEEE. <http://doi.org/10.1109/CIDM.2013.6597247> (Published)

Utilizing Hubel Wiesel models for semantic associations and topics extraction from unstructured text, by TIWARI, Sandeep; RAMANATHAN, Kiruthika. (2011.0). *Proceedings of the 2011 International Joint Conference on Neural Networks, San Jose, California, 2011 July 31 - August 5*, San Jose: IEEE. <http://doi.org/10.1109/IJCNN.2011.6033316> (Published)

A Hubel Wiesel model of early concept generalization based on local correlation of input features, by SADEGHI, Sepideh; RAMANATHAN, Kiruthika. (2011.0). *Proceedings of the 2011 International Joint Conference on Neural Networks, San Jose, California, 2011 July 31 - August 5*, (pp. 1-8) San Jose: IEEE. <http://doi.org/10.1109/IJCNN.2011.6033291> (Published)

A Hubel Wiesel model for hierarchical representation of concepts in textual documents, by RAMANATHAN, Kiruthika; SHI, Luping; TOW, Chong Chong. (2010.0). *Proceedings of the 32nd Annual Meeting of the Cognitive Science Society, Portland, Oregon, 2010 August 11-14*, (pp. 1106-1111) Portland, Oregon: <https://escholarship.org/uc/item/57w312q3> (Published)

A neural network model for a hierarchical spatio-temporal memory, by RAMANATHAN, Kiruthika; SHI, Luping; LI, Jianming; LIM, Kian Guan, LI, Ming Hui; ANG, Zhi Ping; TOW, Chong Chong. (2008.0). *Advances in Neuro-Information Processing: 15th International Conference, ICONIP 2008, Auckland, New Zealand, November 25-28: Proceedings*, (pp. 428-435) Cham: Springer. https://doi.org/10.1007/978-3-642-02490-0_53 (Published)

Evolutionary combinatorial optimization for recursive supervised learning with clustering, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2007.0). *Proceedings of the 2007 IEEE Congress on Evolutionary Computation, Singapore, September 25-28*, (pp. 1168-1174) Singapore: IEEE. <http://doi.org/10.1109/CEC.2007.4424602> (Published)

Recursive self organizing maps with hybrid clustering, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei. (2006.0). *Proceedings of the 2006 IEEE Conference on Cybernetics and Intelligent Systems, Bangkok, Thailand, June 7-9*, Bangkok, Thailand: IEEE. <http://doi.org/10.1109/ICCIS.2006.252268> (Published)

MultiLearner based recursive supervised training, by RAMANATHAN, Kiruthika; GUAN, Sheng Uei; IYER, Laxmi R.. (2006.0). *Proceedings of the 2006 IEEE Conference on Cybernetics and Intelligent Systems, Bangkok, Thailand, June 7-9*, Bangkok, Thailand: IEEE. <http://doi.org/10.1109/ICCIS.2006.252267> (Published)

Recursive percentage based hybrid pattern (RPHP) training for curve fitting, by GUAN, Sheng Uei; RAMANATHAN, Kiruthika. (2004.0). *Proceedings of the 2004 IEEE Conference on Cybernetics and Intelligent Systems, Singapore, December 1-4*, Singapore: <http://doi.org/10.1109/ICCIS.2004.1460456> (Published)

Surface roughness modeling, by PATRIKAR, Rajendra M.; RAMANATHAN, Kiruthika. (2002.0). *Proceedings of the International Conference on Scientific and Engineering Computation, Singapore, 2002 December 3-5*, (pp. 239-242) Singapore: World Scientific. https://doi.org/10.1142/9781860949524_0055 (Published)

Surface roughness modelling with neural networks, by PATRIKAR, Rajendra M.; RAMANATHAN, Kiruthika; ZHUANG, Wenjun. (2002.0). *Proceedings of the 9th International Conference on Neural Information Processing, Singapore, 2002 November 18-22*, Singapore: IEEE. <http://doi.org/10.1109/ICONIP.2002.1199003> (Published)

Research Grants

Other Institutions

Gen-AI Mentor for IS project Experience: Enhancing Proposal Quality , ESG, SMU Centre for Teaching excellence PI (Project Level): Kiruthika RAMANATHAN, Co-PI (Project Level): Rafael J. BARROS, Kyong Jin SHIM, 2024, SGD9,000

Personalized projects and labs for Enterprise Solutions Management using AI Builder, TEL Exploratory research grant, SMU Centre for Teaching excellence PI (Project Level): Kiruthika RAMANATHAN, Co-PI (Project Level): Rafael J. BARROS, 2023, SGD6,000

TEACHING

Courses Taught

Singapore Management University

Undergraduate Programmes :

- Business Process Analysis & Solutioning
- Computing Fundamentals
- Digital Business - Technologies and Transformation
- Digital Technologies for Environmental Sustainability
- Enterprise Solution Management
- IS Project Experience (Research)
- IS/SMT Project Experience (Applications)

Postgraduate Professional Programmes :

- Systems Thinking

Non-Graduating Programmes :

- Digital Technologies for Environmental Sustainability

Non-SMU Programmes :

- Digital Technologies for Environmental Sustainability, Undergraduate, SMU Global Summer Programme

UNIVERSITY SERVICE

Singapore Management University

Session Chair, Panel Discussion Moderator, Nov 2024
Committee Chair, School Evaluation Committee, Oct 2024
Panel Moderator, SCIS Industry day, Sep 2024
Module Coordinator, Business Process Analysis and Solutioning, Aug 2024 - Dec 2024
Committee Member, Capstone project evaluation committee for Naqiyah Abbas Dharawala, Jul 2024
Programme Director, Digital Transformation, Master of Technology in Business, Jul 2024 - Present
Attendee Meeting, SCIS Scholars day, May 2024
Workshop Organizer, SMU Makerspace workshop, May 2024
Sample Teach, SMU Open House, Feb 2024
Committee Member, SCIS scholarship interviews, Jan 2024
Judge, Women in Tech, Oct 2023
Guest lecturer, Web Application development, Sep 2023
Guest Speaker, SMU Makerspace, May 2023
Student Placement, Regular Admission Interviews, Apr 2023
Faculty engaging visitors, SMU Open House, Feb 2023
Workshop facilitator, Computing@SMU festival, Dec 2022
Faculty manager, IS483: IS Project experience , Jul 2022 - Present

EXTERNAL SERVICE – PROFESSIONAL

Workshop Organizer, Workshop , Edutech Asia, 2024
Guest Speaker, Facilitator, Asia Pacific Centre of Management Education, 2024
Mentor, Science Mentorship programme, Ministry of education, 2024

EXTERNAL SERVICE – PUBLIC SECTOR AND COMMUNITY SERVICE

Guest Speaker, Global Partnership on Artificial Intelligence, Digital India, 2023
Judge, NUS Hack 2023, NUS High School of Mathematics and Science, 2023
Guest Speaker, Sustainability chapter, Singapore Computer Society, 2023
Mentor, Tech For Good , Engineering Good, 2023
Judge, NUS Hack 2022, NUS High School of Mathematics and Science, 2022