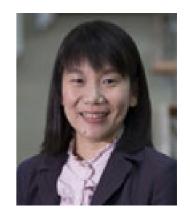TAN Kar Way

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

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Office Phone: (+65) 68280706

Education

PhD, Singapore Management University, Singapore, 2014

Bachelor of Science, National University of Singapore, Singapore, 1998

Academic Appointments

Associate Professor of Information Systems (Practice), School of Computing and Information Systems, SMU, Jul 2020 - Present

Assistant Professor of Information Systems (Practice), School of Computing and Information Systems, SMU, Apr 2014 - Jun 2020

Academic Administrative Positions

Acting Associate Dean, SCIS Post-Graduate Professional Education, School of Computing and Information Systems, SMU, Jan 2024 - Present

Director, MITB (Analytics) Programme, School of Computing and Information Systems, SMU, Jul 2020 - Present

Programme Director, BSc (IS) Smart-City Management & Technology Major, School of Computing and Information Systems, SMU, Jul 2017 - Jun 2020

Academic Director, Green Transformation Lab (DHL-SMU), SMU, Apr 2014 - Mar 2017

Other Positions and Affiliations

IT Advisory Specialist, IBM Singapore Pte Ltd, IBM Global Services, Singapore, Jan 1998 - Jan 2005

Awards and Honors

Developing Emerging Skills and Competencies Award (Bronze) - Sustainable Living: Analytics Applications for Smart Living, QS Reimagine Education, 2022

The Commendation Medal (Pingat Kepujian), Prime Minister Office, 2020

Innovative Teacher Award, Singapore Management University, 2019

Nominee of the Most Innovative Teacher, Singapore Management University, 2018

Project titled "A framework for evaluating energy sustainability efforts in maritime terminal operations: A study with Singapore and selected International ports" received the Special Mention Award as the top voted policy research project under the SMI Research Showcase April 2016., 2016

Professional Memberships

Member, IEEE Professional, 2013

RESEARCH

Research Interests

Kar Way's research interests span across two main areas: healthcare analytics and learning analytics. Her healthcare research examines healthcare processes by taking the data-driven approach. She analyses and addresses operational issues involving patient flow and test procedures in the emergency room, downstream bed management and surgical scheduling processes. The techniques applied include simulation, machine learning algorithms and optimization. Over the last decade, Kar Way has worked with numerous healthcare institutions, bridging research to real-world implementation.

In the area of learning analytics, Kar Way takes keen interests in research involving analysis of informal student reflections as a form of feedback mechanism that provides instructors with guiding principles for interventions required to help students learn. An on-going project is an automated text-mining approach to scoring students' understanding and identifying doubts on weekly basis to enable personalized learning.

Prior to her career in SMU, Kar Way has spent several years implementing large-scale enterprise systems as an IT consultant. Her experiences allow her to appreciate and conceive research solutions which create impact in real-world businesses and society.

Research and Project Areas

Data analytics, decision analytics, simulation, healthcare, logistics, enhanced learning and pedagogy.

Publications

Journal Articles [Refereed]

Automated doubt identification from informal reflections through hybrid sentic patterns and machine learning approach, by LO, Siaw Ling; TAN, Kar Way; OUH, Eng Lieh. (2021). *Research and Practice in Technology Enhanced Learning, 16* (1), 1-24. https://doi.org/10.1186/s41039-021-00149-9 (Published)

Hippi Care Hospital: Towards proactive business processes in emergency room services, by TAN, Kar Way; SHANKARARAMAN, Venky. (2014). *Journal of Information Systems Education, 25* (4), 283-288. (Published)

Books (Refereed)

Business process engineering methodology by SHANKARARAMAN, Venky; TAN, Kar Way; THONSE, Srinivas; GUPTA, Mayank; DESHMUKH, Nivedita P.. (2006). Singapore: Pearson/Prentice Hall.

https://worldcat.org/isbn/9789810677626 (Published)

Books (Non-Refereed)

Aligning IT solutions with business processes: A methodological approach by SHANKARARAMAN, Venky; TAN, Kar Way; THONSE, Srinivas; GUPTA, Mayank; DESHMUKH, Nivedita. (2007). Singapore: Pearson/Prentice Hall. http://worldcat.org/isbn/9789810679231 (Published)

Conference Proceedings

A big data approach to augmenting the Huff model with road network and mobility data for store footfall prediction, by TAN, Ming Hui; TAN, Kar Way; LAU, Hoong Chuin. (2023.0). *Proceedings of the 2023 IEEE International Conference on Big Data, Sorrento, Italy, December 15-18,* New Jersey: IEEE. (Published)

Combat COVID-19 at national level using risk stratification with appropriate intervention , by JIN, Xuan; TAN, Kar Way. (2023.0). *Proceedings of the 2023 IEEE International Conference on Big Data, Sorrento, Italy, December 15-18,* New Jersey: IEEE. (Published)

Machine-learning approach to automated doubt identification on stack overflow comments to guide programming learners, by CHEN, Tianhao; OUH, Eng Lieh; TAN, Kar Way; LO, Siaw Ling. (2023.0). *Proceedings of 2023 Pacific Asia Conference on Information Systems, Nanchang, China, July 8-12,* (pp. 1-16) Nanchang, China: PACIS. (Published)

AI-enabled adaptive learning using automated topic alignment and doubt detection, by TAN, Kar Way; LO, Siaw Ling; OUH, Eng Lieh; NEO, Wei Leng. (2022.0). *Pacific Asia Conference on Information Systems PACIS 2022: Virtual, July 5-9: Proceedings,* (pp. 1-16) Virtual: AIS. https://aisel.aisnet.org/pacis2022/110/ (Published)

Data-driven retail decision-making using spatial partitioning and delineation of communities, by TAN, Ming Hui; TAN, Kar Way. (2022.0). *Pacific Asia Conference on Information Systems PACIS 2022: Virtual, July 5-9: Proceedings,* (pp. 1-15) Atlanta: AIS. https://aisel.aisnet.org/pacis2022/117/ (Published)

Exploring and evaluating the impact of COVID-19 on mobility changes in Singapore, by GUNAWAN, Aldy; TRAN, Linh Chi; TAN, Kar Way; WANG, I-Lin. (2022.0). *Proceedings of the 12th Annual International Conference on Industrial Engineering and Operations Management, Istanbul, Turkey, 2022 March 7-10,* (pp. 4104-4115) Istanbul, Turkey: IEOM. https://ieomsociety.org/proceedings/2022istanbul/773.pdf (Published)

Discovery of mental wellness via social analytics for liveability in an urban city, by TAN, Kar Way. (2021.0). *2021 17th IEEE International Conference on Automation Science and Engineering (CASE): Lyon, France, August 23-27: Proceedings,* (pp. 1-6) Piscataway, NJ: IEEE. https://doi.org/10.1109/CASE49439.2021.9551606 (Published)

Redesigning patient flow in paediatric eye clinic for pandemic using simulation, by TAN, Kar W.; GOH, Bee K.; GUNAWAN, Aldy. (2021.0). *Proceedings of the 2021 IEEE International Smart Cities Conference (ISC2),* USA: IEEE. (Published)

Social participation performance of wheelchair users using clustering and geolocational sensor's data, by YIN, Yukun; TAN, Kar Way. (2020.0). *Proceedings of the 16th International Conference on International Conference on Automation Science and Engineering (CASE), Hong Kong, 2020 August 20-21,* (pp. 1-6) Hong Kong: IEEE. (Published)

Do my students understand? Automated identification of doubts from informal reflections, by LO, Siaw Ling; TAN, Kar Way; OUH, Eng Lieh. (2019.0). *Proceedings of the 27th International Conference on Computers in Education, Kenting, Taiwan, December 2-6,* (pp. 1-10) Kenting, Taiwan: Asia-Pacific Society for Computers in Education. (Published)

Data-driven surgical duration prediction model for surgery scheduling: A case-study for a practice-feasible model in a public hospital, by TAN, Kar Way; NGUYEN, Francis Ngoc Hoang Long; ANG, Boon Yew; GAN, Jerald; LAM, Sean Shao Wei. (2019.0). *2019 IEEE 15th International Conference on Automation Science and Engineering (CASE): Vancouver, Canada, August 22-26: Proceedings,* (pp. 275-280) Piscataway, NJ: IEEE. https://doi.org/10.1109/COASE.2019.8843299 (Published)

Data-driven decision-support for process improvement through predictions of bed occupancy rates, by

TAN, Kar Way; NG, Qi You; NGUYEN, Francis Ngoc Hoang Long; LAM, Sean Shao Wei. (2019.0). *2019 IEEE Conference of Automation Science and Engineering: Vancouver, BC, 22-26 August,* (pp. 133-139) Piscataway, NJ: IEEE. https://doi.org/10.1109/COASE.2019.8843135 (Published)

Using teaching cases for achieving Bloom's high-order cognitive levels: An application in technically-oriented information systems course, by TAN, Kar Way. (2017.0). *Proceedings of the 2017 SIGED International Conference on Information Systems Education and Research, Seoul, December 10,* Seoul: (Published)

Traffic simulation model for port planning and congestion prevention, by LI, Baoxiang; TAN, Kar Way; TRAN, Trong Khiem. (2016.0). *WSC 2016: Winter Simulation Conference, Washington, DC, December 11-14: Proceedings,* (pp. 2382-2393) Piscataway, NJ: IEEE. https://doi.org/10.1109/WSC.2016.7822278 (Published)

Improving carbon efficiency through container size optimization and shipment consolidation, by MA, Nang Laik; TAN, Kar Way; CHONG, Edwin Lik Ming. (2016.0). *Proceedings of the International Conference on Logistics and Transport: 8th ICLT 2016, September 6-8, Singapore,* (pp. 10-10) Singapore: ICLT. (Published)

Reducing carbon emission of ocean shipments by optimizing container size selection, by CHONG, Edwin Lik Ming; MA, Nang Laik; TAN, Kar Way. (2014.0). *2014 IEEE International Conference on Automation Science and Engineering (CASE): Taipei, 18-22 August: Proceedings,* (pp. 480-485) Piscataway, NJ: IEEE. https://doi.org/10.1109/CoASE.2014.6899369 (Published)

Improving patient length-of-stay in emergency department through dynamic queue management, by TAN, Kar Way; LAU, Hoong Chuin; LEE, Francis Chun Yue. (2013.0). *WSC 2013: Winter Simulation Conference: Washington DC, December 8-11: Proceedings,* (pp. 2362-2373) Piscataway, NJ: IEEE. https://doi.org/10.1109/WSC.2013.6721611 (Published)

Improving patient length-of-stay in emergency department through dynamic resource allocation policies, by TAN, Kar Way; TAN, Wei Hao; LAU, Hoong Chuin. (2013.0). *2013 IEEE International Conference on Automation Science and Engineering (CASE 2013): Madison, Wisconsin, USA, 17-20 August 2013,* (pp. 984-989) Piscataway, NJ: IEEE. http://doi.org/10.1109/CoASE.2013.6653988 (Published)

Improving patient flow in emergency department through dynamic priority queue, by TAN, Kar Way; WANG, Chao; LAU, Hoong Chuin. (2012.0). *IEEE International Conference on Automation Science and Engineering (CASE) 2012: Seoul, Korea, August 20-24, 2012,* (pp. 125-130) Piscataway, NJ: IEEE. http://doi.org/10.1109/CoASE.2012.6386409 (Published)

Improving service through just-in-time concept in a dynamic operational environment, by TAN, Kar Way; LAU, Hoong Chuin; FU, Na. (2011.0). *Proceedings of the 44th Annual Hawaii International Conference on System Sciences: 4-7 January 2011, Koloa, Kauai, Hawaii,* (pp. 1-9) Los Alamitos, CA: IEEE Computer Society. http://doi.ieeecomputersociety.org/10.1109/HICSS.2011.237 (Published)

Spatial cloaking revisited: Distinguishing information leakage from anonymity, by TAN, Kar Way; LIN, Yimin; MOURATIDIS, Kyriakos. (2009.0). *Advances in Spatial and Temporal Databases: 11th International Symposium, SSTD 2009 Aalborg, Denmark, July 8-10, 2009 Proceedings,* (pp. 117-134) Berlin: Springer Verlag. https://doi.org/10.1007/978-3-642-02982-0_10 (Published)

Applying sanitizable signature to web-service-enabled business processes: Going beyond integrity protection, by TAN, Kar Way; DENG, Robert H.. (2009.0). *ICWS 2009: IEEE 7th International Conference on Web Services, Los Angeles, CA, 6-10 July: Proceedings,* (pp. 67-74) Los Alamitos, CA: IEEE Computer Society. https://doi.ieeecomputersociety.org/10.1109/ICWS.2009.34 (Published)

Conference Papers

A framework for evaluating energy sustainability efforts for maritime smart port operations, by TAN, Kar Way; KAN, Michelle; TAN, Pang Jin; SCHABLINSKI, Stephan. (2018.0). *International Conference on ICT for Smart Society 2018, Indonesia, October 10-12,* Indonesia. (Presented)

A data-driven approach for benchmarking energy efficiency of warehouse buildings, by LEE, Wee Leong; TAN, Kar Way; LIM, Zui Young. (2017.0). *3rd PROLOG Project & Logistics 2017, May 11-12,* La Rochelle, France. (Presented)

Improving patient flow with data-driven patient prioritization method in the Emergency Department, by

TAN, Kar Way; LAM, Sean Shao Wei. (2015.0). *INFORMS Healthcare Conference 2015, July 29-31*, Nashville, TN. (Presented)

Is your waste a waste?, by TAN, Kar Way; ONG, Marcus Jiong Kai; HO, Sijie; KAN, Michelle. (2016, December). *Asian Management Insights, 3* (2), https://cmp.smu.edu.sg/ami/article/20161208/your-waste-waste (Published)

Theses and Dissertations

Dynamic queue management for hospital emergency room services (Doctoral dissertation), by TAN, Kar Way. (2013). Singapore: Singapore Management University. http://ink.library.smu.edu.sg/etd_coll/109/ (Published)

Other Outputs and Contributions

Reports

A framework for evaluating energy sustainability efforts in maritime terminal operations by TAN, Kar Way; KAN, Michelle; TAN, Pang Jin; KOH, Yi Tong; LEE, Wee Liang. (2015). (Presented)

Audio / Video Materials

Towards sustainable, green growth [Podcast@SMU] [Audio/Video], by TAN, Kar Way. (2015, March 01). http://www.smu.edu.sg/podcast/towards-sustainable-green-growth (Published)

Posters

A framework for evaluating energy sustainability efforts in maritime terminal operations, by TAN, Kar Way; Members of Green Transformation Lab. (19 Apr 2016). *Singapore Maritime Institute Research Showcase April 2016, Singapore Maritime Week 2016,* (Published)

Research Grants

Singapore Management University

A Study for Evaluating Energy Sustainability Efforts in Maritime Terminal Operations in Singapore and with Selected International Ports (Phase 1), Singapore Maritime Institute , PI (Project Level): TAN Kar Way, 2015, S$70,224

Green Transformation Lab, DHL , PI (Project Level): TAN Kar Way, 2015, S$480,000

CISCO Asia Logistic Network Study, DHL , Co-PI (Project Level): TAN Pang Jin, Michelle KAN, TAN Kar Way, 2015, S$14,000

Green Transformation Lab, DHL , PI (Project Level): TAN Kar Way, 2013, S$500,000

Service improvement for A&E via Robust Optimization, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): LAU Hoong Chuin, 2011, S$24,898.42

Business Process Engineering Methodology Textbook- Pedagogy Project Proposal, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): Venky SHANKARARAMAN , Co-PI (Project Level): TAN Kar Way, 2006, S$22,538.89

Other Institutions

Adaptive Learning with Automated Doubt Mining and Topic Alignment, Technology-Enabled Learning Grant, Centre of Teaching Excellence PI (Project Level): TAN Kar Way, Co-PI (Project Level): LO Siaw Ling, OUH Eng Lieh, 2020

Enterprise in a Classroom, MOE, Ministry of Education, Singapore and Singapore Management University PI (Project Level): Venky SHANKARARAMAN, Co-PI (Project Level): TAN Kar Way, 2011, SGD231,800

TEACHING

Teaching Areas

Analytics, enterprise systems, digital experience platform, simulation, healthcare,

Courses Taught

Singapore Management University

Undergraduate Programmes :

Analytics Applications for Smart Living

Analytics Foundation

Introductory Data Analytics in Healthcare

IS Project Experience (Applications)

IS/SMT Project Experience (Applications)

Postgraduate Professional Programmes :

Capstone Project - Software and Cyber-Physical Systems

Data Analytics Lab

Process Analytics and Applications

Process Analytics using Simulation

Project

Postgraduate Research Programmes :

Empirical Research Project I

Empirical Research Project II

Empirical Research Project III

Executive Development :

Decision Making using Data, Infineon, 18 Nov 2021-18 Nov 2021

Data Analytics Techniques for Data Analysts, PSA, 12 Oct 2017-24 Jan 2018

Appreciation of Data Analytics for Leaders, PSA, 14 Sep 2017-08 Jan 2018

Circular Economy Workshop, 03 Jul 2016-03 Jul 2016

Unlocking the value of circular economy, 17 Mar 2016-17 Mar 2016

Proactive Healthcare, 11 Jan 2015-11 Jan 2015

Proactive Healthcare Processes, 11 Jan 2014-11 Jan 2014

Teaching Publications

Cases

The healthcare analytics landscape in Singapore: Evolving to deliver better care, by TAN, Kar Way; LAM, Sean Shao Wei; CHEAH, Sin Mei. (2020). SMU-20-0026. https://cmp.smu.edu.sg/case/4496 (Published)

iNET: Overcoming a legacy web portal at Singapore Management University, by TAN, Kar Way; BHARDWAJ, Sheetal. (2017). SMU-17-0008. https://www.thecasecentre.org/educators/products/view?id=147318 (Published)

GLC: Delivery through shared responsibility, by TAN, Kar Way; SHANKARARAMAN, Venky; CHAN, Chi Wei. (2017). SMU-17-0012. http://alex.sg/smu/glc-delivery-through-shared-responsibility/ (Published)

Teaching Notes

The healthcare analytics landscape in Singapore: Evolving to deliver better care, by TAN, Kar Way; CHEAH, Sin Mei; LAM, Sean Shao Wei. (2020). SMU-20-0026. https://cmp.smu.edu.sg/case/4496 (Published)

iNET: Overcoming a legacy web portal at Singapore Management University, by TAN, Kar Way; BHARDWAJ, Sheetal. (2017). SMU-17-0008TN. https://www.thecasecentre.org/educators/products/view?id=147319 (Published)

GLC: Delivery through shared responsibility, by TAN, Kar Way; SHANKARARAMAN, Venky; CHAN, Chi Wei. (2017). SMU-17-0012TN. https://www.thecasecentre.org/educators/products/view?id=147317 (Published)

OTHER ACADEMIC AND PROFESSIONAL ACTIVITIES

Other Grants and Funding Received (Non-Research)

Technology Enhanced Learning (TEL) Fund, Adaptive Learning With Automated Doubt Mining And Topic Alignment, Singapore Management University, May 2020

Presentation and Talks

Presentations

Personalized learning using automated topic alignment and doubt detection, (12 Nov 2021). *Inaugural AUN-TEPL (ASEAN University Network-Thematic Network for Technology Enhanced Personalised Learning),* Virtual.

Do my students understand? Automated identification of doubts from informal reflections, (27 Feb 2020). *Inaugural AUN-TEPL (ASEAN University Network-Thematic Network for Technology Enhanced Personalised Learning),* Singapore

Future of Sustainable mobility in Logistics, (26 May 2017). *Future of Sustainable Mobility in Logistics Industry Round-table,* DHL Asia-Pacific Innovation Centre.

DHL and SMU Industry-Academic Collaboration: Success Stories, (01 Sep 2016). *8th Higher Education Summit Asia 2016,*

<u>Invited Seminars, Talks and Lectures</u>

N2women panel session: Preparation for a career in academia for female PhD students, 22 Oct 2020. 10th EAI International Conference on Mobile Networks and management (Monami) 2020, Japan

Benchmarking energy efficiency: Data-driven approach to benchmarking warehouses and a framework for maritime terminal operations, 23 Sep 2020. Data-driven approach to Drive Supply Chain Excellence Workshop

Consultancy

DHL, Singapore Management University, May 2013

Khoo Teck Puat Hospital, Jan 2011 - Jan 2013

Media Contributions and Citations

What's in Singapore's first Smart City course?, CommonWealth Magazine (Taiwan), 06 Oct 2018
https://www.cw.com.tw/article/article.action?id=5092397

"SMU-DHL collaboration yields unconventional solutions in sustainable logistics". Published 28 March 2016, The Business Times, Newspaper, 01 Jan 2016

"Towards sustainable, green growth", SMU Podcast , Internet, 03 Jan 2015

Greening the Supply Chain, Envision (by National Environment Agency), 30 Nov 2014
https://www.nea.gov.sg/envision-magazine/issue5/

DHL and Singapore Management University Launch Green Transformation Lab, Yahoo!, Channel News Asia, Bernama, Sea Ship News, 09 May 2013

UNIVERSITY SERVICE

Singapore Management University

Committee Chair, Doctorate of Engineering Committee, Jul 2021 - Present

Task Force Member, Gender Equity Taskforce, Apr 2021 - Present

Task Force Member, Strategic Priority Expert Panel (Digital Transformation), Mar 2020 - Jun 2020

Committee Member, PhD Committee, Aug 2018 - Present

EXTERNAL SERVICE – PROFESSIONAL

Editor Journal Editor, Special Issue "Application of Statistical Theory and Machine Learning in Health Services", Healthcare, 2022 - Present

Reviewer Conference Paper, American Conference on Information Systems (AMCIS), 2019 - Present

Event Co-organiser, Innovation in Urban Management and Circular Economy Symposium, Singapore Management University, 2016 - Present

Reviewer Journal Article, European Journal of Operational Research, Elsevier, 2015 - Present

Symposium Organiser, Urban Logistics: E-Commerce and Sustainability Symposium, Singapore Management University, 2014 - Present

Workshop Organizer, Metaheuristics International Conference, Industry Workshop on Supply Chain Analytics, Singapore Management University, 2013

Reviewer Journal Article,
Flexible Services and Manufacturing Journal (FSM), Springer, 2013 - 2014

Reviewer Conference Paper,
International Conference on Information Systems (ICIS), Association for Information Systems, 2013

Reviewer Journal Article, IEEE Transactions on Automation Science and Engineering (TASE), Institute of Electrical and Electronics Engineers (IEEE), 2013 - Present

Reviewer Conference Paper, IEEE Conference on Automation Science and Engineering (CASE), Institute of Electrical and Electronics Engineers (IEEE), 2011 - Present

Reviewer Conference Paper,
Asia Pacific Conference on Information Systems (PACIS), Association for Information Systems, 2010 - 2014

EXTERNAL SERVICE – PUBLIC SECTOR AND COMMUNITY SERVICE

Discussion Leader, Advanced Maritime Leaders Programme (AMLP), Maritime Port Authority of Singapore, 2017