Stanley Kok

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Education

- Ph.D. in Computer Science — University of Washington, USA — 2010
- Master of Science in Computer Science — University of Washington, USA — 2005
- Combined Bachelor of Science (Computer Science) & Bachelor of Arts (Economics) — Brown University, USA — 1999

Research Interests

- Artificial intelligence, machine learning, data science, and their applications.

Professional Experience

- Assistant Professor, Department of Information Systems & Analytics, School of Computing, National University of Singapore. — Jul 2018–present
- Associate Director, NUS Artificial Intelligence Laboratory (NUSAiL) — Nov 2022–May 2024
- Principal Research Scientist, Rakuten Institute of Technology. — Jan 2016–Jun 2018
- Assistant Professor, Singapore University of Tech. & Design (SUTD). — Dec 2011–Nov 2015
- Visiting Scholar, Massachusetts Institute of Technology, USA. — Jan–Dec 2012
- Post-doctoral researcher with Prof. Lise Getoor, Institute for Advanced Computer Studies, University of Maryland–College Park. *Large-scale data integration; inference of social networks from graphs.* — 2010–2011
- Research assistant with Prof. Pedro Domingos, University of Washington. *Automatic learning of concepts & structure from data using Markov logic.* — 2004–2010
- Internship with Dr. Chris Brockett, Microsoft Research, USA. *Large-scale learning of English paraphrases from machine translation data.* — Jul–Sep 2009
- Internship with Dr. Scott Wen-Tau Yih, Microsoft Research, USA. *Automatic mining of product information from large email corpus.* — Jun–Aug 2008
- Research assistant with Prof. Oren Etzioni, University of Washington. *Large-scale, autonomous, and domain-independent information extraction from the Web; reverse engineering of search engines' ranking functions.* — 2003–2004
- Senior IT Consultant, Infocomm Development Authority of Singapore. *Project managed entire life-cycles of multi-million dollar IT projects: feasibility analysis, user study, technical solution evaluation, budgeting, implementation, system migration and testing.* — 2000–2002
- Associate IT Consultant, Infocomm Development Authority of Singapore. *Java J2EE enterprise software development; design and implementation of large-scale system to deliver all public services via the Web.* — 1999–2000

Scholarships, Honors, and Awards

- Faculty Teaching Excellence Honor Roll (National University of Singapore) 2023
- Faculty Teaching Excellence Award (National University of Singapore) 2021, 2022, 2023
- Outstanding Reviewer for Conference on Empirical Methods in 2020
  Natural Language Processing (EMNLP)
- Rakuten Asia Incubation Competition (1st Prize) 2017
  Developed winning business proposal for language learning service
  based on video dramas and AI, which is subsequently funded
- International Conference on Machine Learning (ICML) Student Scholarship 2005
- Infocomm Development Authority of Singapore Undergraduate Scholarship 1995-1999
- Magna cum laude, Brown University (highest honor at Brown University) 1999
- Honors in computer science, Brown University 1999
- Omicron Delta Epsilon, the International Honors Society in Economics 1999
- Sigma Xi, the Scientific Research Honors Society 1998

Courses Developed and Taught

Analytics for Capital Market Trading And Investment	NUS	Aug–Dec 2024	(Student evaluation: 4.5/5)
		Aug–Dec 2023	(Student evaluation: 4.6/5)
		Aug–Dec 2022	(Student evaluation: 4.7/5)
		Jan–May 2022	(Student evaluation: 4.7/5)
		Jan–May 2021	(Student evaluation: 4.4/5)
		Jan–May 2020	(Student evaluation: 4.6/5)
		Jan–May 2019	(Student evaluation: 4.4/5)
Artificial Intelligence	SUTD	May–Aug 2015	(Student evaluation: 4.8/5)
AI Online Class	SUTD	Jan–Apr 2015	(No evaluation)
Machine Learning	SUTD	Sep–Dec 2014	(Student evaluation: 4.6/5)
Digital World (Intro. to CS; revamped)	SUTD	Jan–May 2014	(Student evaluation: 4.7/5)
Digital World (Intro. to CS)	SUTD	Jan–May 2013	(Student evaluation: 4.9/5)

Courses Taught

Hands-On Applied Analytics	NUS	Jan–May 2024	(Student evaluation: 4.3/5)
Computational Methods for Business Analytics	NUS	Aug–Dec 2022	(Student evaluation: 4.8/5)
		Aug–Dec 2021	(Student evaluation: 4.4/5)
		Aug–Dec 2020	(Student evaluation: 4.6/5)
		Aug–Dec 2019	(Student evaluation: 4.5/5)
Intro. to Elec. Engr. & Comp. Science	MIT	Fall 2012	(Student evaluation: 6/7)

Invited Talks

- Business Applications of Data Science session, Institute of Operations Research & The Management Sciences (INFORMS) annual meeting, Washington, USA — 2019
- Rakuten Technology Conference, Tokyo, Japan — 2017
- Changi General Hospital, Singapore — 2013
- Clinical Decision Making Group, Massachusetts Institute of Technology, USA — 2012
- Human Dynamics Laboratory, Massachusetts Institute of Technology, USA — 2012
- Decisive Analytics Corporation, Virginia, USA — 2011
- DSO National Labs, Singapore — 2010
- School of Information Systems, Singapore Management University — 2010
- School of Computer Engineering, Nanyang Technological University, Singapore — 2010
- Institute for Infocomm Research, Singapore — 2010
- University of Washington/Microsoft 19th Symposium in Computational Linguistics — 2009
- Mathematics and Computing Technology, Boeing, Washington, USA — 2009
- Probabilistic Models of Cognition: The Mathematics of Mind (Graduate Summer School), Institute of Pure & Applied Math, University of California, Los Angeles — 2007

Patents

- Locating Paraphrases through Utilization of a Multipartite Graph (United States 8484016). Chris Brockett, Stanley Kok, and Dengyong Zhou, Microsoft Corporation, USA. — 2013

Software Released

Interpretable Predictive Models for Healthcare via Rational Multi-Layer Perceptrons	https://github.com/tsuttaket2/RMLP	2024
AQE: Argument Quadruplet Extraction via a Quad-Tagging Augmented Generative Approach	https://github.com/guojiapub/QuadTAG	2023
Towards Integration of Discriminability and Robustness for Document-Level Relation Extraction	https://github.com/guojiapub/PEMSCL	2023
BiQUE: Biquaternionic Embeddings of Knowledge Graphs	https://github.com/guojiapub/BiQUE	2021
Probabilistic Logic Graph Attention Networks for Reasoning	https://github.com/Harsha2399/pGAT	2020
Sum-Product Networks for Language Modeling	https://github.com/stakok/lmspn	2015
The Alchemy System for Statistical Relational AI	http://alchemy.cs.washington.edu	2006-2017
Learning using Structural Motifs	http://alchemy.cs.washington.edu/papers/kok10	2010
Learning via Hypergraph Lifting	http://alchemy.cs.washington.edu/papers/kok09a	2009
Semantic Network Extractor	http://alchemy.cs.washington.edu/papers/kok08	2008

Professional Service

- Technical Advisor on Rakuten's Global Advisory Committee — 2020–21
- National Science Foundation (USA) Proposal Reviewer — 2012, 2015, 2019
- Funding Proposals Review Panelist, Information & Intelligent Systems Division, National Science Foundation (NSF), USA — 2011–12
- Search Committee for Head of Dept. of Info. Sys. & Analytics (NUS) — 2021
- Chair of Faculty Recruitment Committee (SUTD's ISTD Pillar) — 2012–14
- Associate Editor
  - AI in Business & Society Track, Intl. Conf. on Info. Systems (ICIS) — 2022
  - E-Business on Digital & Mobile Platforms Track, Pacific Asia Conf. on Info. Systems (PACIS) — 2022
  - Digital & Mobile Commerce Track, Intl. Conf. on Info. Systems (ICIS) — 2021
- Organizing Committee Member
  - Tutorial Co-chair, Asian Conference on Machine Learning (ACML) — 2012
- Senior Program Committee Member
  - International Joint Conference on Artificial Intelligence (IJCAI) — 2020–22, 2024
  - Conference on Artificial Intelligence (AAAI) — 2021
- Program Committee Member
  - Annual Meeting of the Association for Computational Linguistics (ACL) — 2023
  - Conference on Empirical Methods in Natural Lang. Processing (EMNLP) — 2020–22
  - Conference on Artificial Intelligence (AAAI) — 2011–14, 2020
  - Conference on Neural Information Processing Systems (NeurIPS) — 2019, 2020
  - International Conference on Machine Learning (ICML) — 2011–14, 2019
  - International Joint Conference on Artificial Intelligence (IJCAI) — 2011, 2015, 2019
  - SIAM International Conference on Data Mining (SDM) — 2019
  - AAAI Workshop on Statistical Relational Artificial Intelligence — 2013
  - Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) — 2012
  - IEEE International Conference on Semantic Computing (ICSC) — 2011
- Reviewer
  - International Conference on Machine Learning (ICML) — 2021
  - International Conference on Learning Representations (ICLR) — 2021
  - Journal of IEEE Transactions on Engineering Management (TEM) — 2020
  - International Conference on Information Systems (ICIS) — 2020
  - Workship on Information Technologies and Systems (WITS) — 2020, 2022
  - International World Wide Web Conference (WWW) — 2015
  - Machine Learning Journal — 2008–11, 2015
  - Neurocomputing Journal — 2015
  - Journal of Artificial Intelligence Research — 2009, 2011–12
  - IEEE Intelligent Systems — 2010
  - Conference on Uncertainty in Artificial Intelligence — 2010

- IEEE Transactions on Knowledge and Data Engineering   2009
- ACM Transactions on Knowledge Discovery from Data   2008

Professional Memberships

- Association for Computing Machinery (ACM)   2011–present
- Association for the Advancement of Artificial Intelligence (AAAI)   2010–present
- Association for Information Systems (AIS)   2018–2023
- MENSA   1991–present

Funding

- *EMPOWERing Patients with Type 2 Diabetes Mellitus in Primary Care through App-Based Motivational Interviewing PLUS Artificial Intelligence Powered Diabetes Management (EMPOWER-PLUS) – A Pragmatic Randomised Controlled Trial*, Ministry of Health, $491,550 (co-I, in collaboration with PI Lian Leng Low and other co-Is).   Mar 2022–Feb 2025

- *Extracting and Scoring the Reasoning and Prediction of Financial Experts' Comments from Textual Information*, Asian Institute of Digital Finance, Singapore National Research Foundation & Monetary Authority of Singapore, $1.986 million (co-I, in collaboration with PI Ke-Wei Huang and other co-Is).   Jul 2020–Jun 2025

- *National Innovation Challenge (Chronic Disease Management) Grant*, Ministry of Health, $333,332 ($1.7 million to other participants).   Jul 2019–Dec 2022

- *Start-up Grant (MOE Tier 1)*, National University of Singapore, $180,000.   Aug 2018–Feb 2023

- *Artificial Intelligence Enabled Computer Games for Rehabilitation*, Media Development Authority of Singapore, $261,675.   Oct 2014–Mar 2016

- *Combining Music Therapeutic Knowledge and the Science of Recovery In Game Design for Stroke Rehabilitation (Phase 1)*, Media Development Authority of Singapore, $200,500.   Apr 2013–Sep 2014

- *Acoustic and Language Modeling with Sum-Product Networks*, DSO National Laboratories, $228,000.   Aug 2013–Dec 2014

- *Start-up Grant*, Singapore University of Technology & Design, $150,000.   Jan 2013–Dec 2015

Students (Current)

- Junyi Liu,   PhD student,   Department of Information Systems & Analytics.
- Yan Sun,   PhD student,   Department of Information Systems & Analytics.
- Xue Wen Tan,   PhD student,   Asian Institute of Digital Finance.
- Dennis Thumm,   PhD student,   Asian Institute of Digital Finance.

Students (Graduated)

- Jia Guo, Senior Algorithm Engineer, Alipay.
  Dissertation: *Semantic Knowledge Representation and Acquisition* (May 2024).

  Thiti Suttaket, Senior Data Analytics Manager, Generali.
  Dissertation: *Two Essays on Interpretable Predictive Models and Multicalibrated Survival Analysis for Healthcare* (Dec 2023).

Journal Publications

- "Interpretable Predictive Models for Healthcare via Rational Multi-Layer Perceptrons." Thiti Suttaket and Stanley Kok. *ACM Transactions on Management Information Systems*, Jun 2024.

- "Referent Graph Embedding Model for Name Entity Recognition of Chinese Car Reviews." Zhao Fang, Qiang Zhang, Stanley Kok, Ling Li, Anning Wang, and Shanlin Yang. *Knowledge-Based Systems*, Volume 233, Dec 2021.

- "E-Commerce Product Categorization via Machine Translation." Liling Tan, Maggie Li Yundi, and Stanley Kok. *ACM Transactions on Management Information Systems*, 2020.

- "Combining Levodopa and Virtual Reality-Based Therapy for the Rehabilitation of Upper Limb After Acute Stroke: Pilot Study Part II." Geoffrey S. Samuel, Nicodemus E. Oey, Min Choo, Han Ju, Wai Yin Chan, Stanley Kok, Yu Ge, Antonius M Van Dongen, and Yee Sien Ng. *Singapore Medical Journal*, 2017.

- "CrowdOp: Query Optimization for Declarative Crowdsourcing Systems." Ju Fan, Meihui Zhang, Stanley Kok, Meiyu Lu, and Beng Chin Ooi. *IEEE Transaction on Knowledge and Data Engineering*, 2015.

- "The Use of Virtual Reality Based Therapy to Augment Post-Stroke Upper Limb Recovery: a Case Study." Geoffrey S. Samuel, Min Choo, Wai Yin Chan, Stanley Kok, and Yee Sien Ng. *Singapore Medical Journal*, 2015.

Conference Publications

- "Unsupervised Multiple Kernel Learning for Graphs via Ordinality Preservation." Yan Sun and Stanley Kok. *International Conference on Learning Representations (ICLR)*, 2025.

- "Investigating the Effects of Cognitive Biases in Prompts on Large Language Model Outputs." Yan Sun and Stanley Kok. *International Conference on Information Systems (ICIS)*, 2024.

- "ScamGPT-J: Inside the Scammer's Mind, A Generative AI-based Approach Toward Combating Messaging." Xue Wen Tan, Kenneth See, and Stanley Kok. *International Conference on Information Systems (ICIS)*, 2024.

- "Prediction of Bank Credit Ratings using Heterogeneous Topological Graph Neural Networks." Junyi Liu and Stanley Kok. *Workshop on Information Technologies and Systems (WITS)*, 2024.

- "Explainable Risk Classification in Financial Reports." Xue Wen Tan and Stanley Kok. *International Conference on Information Systems (ICIS)*, 2023.

- "AQE: Argument Quadruplet Extraction via a Quad-Tagging Augmented Generative Approach." Jia Guo, Liying Cheng, Wenxuan Zhang, Stanley Kok, Xin Li and Lidong Bing. *The Findings of the 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.

- "Towards Integration of Discriminability and Robustness for Document-Level Relation Extraction." Jia Guo, Stanley Kok and Lidong Bing. *The 17th Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, 2023.

- "In-Training Multicalibrated Survival Analysis For Healthcare via Constrained Optimization." Thiti Suttaket and Stanley Kok. *International Conference on Information Systems (ICIS)*, 2022.

- "Interpretable Predictive Models for Healthcare via Rational Logistic Regression." Thiti Suttaket, L Vivek Harsha Vardhan, and Stanley Kok. *International Conference on Information Systems (ICIS)*, 2021. **(Nominated for Best Student Paper Award.)**

- "BiQUE: Biquaternionic Embeddings of Knowledge Graphs." Jia Guo and Stanley Kok. *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021.

- "Don't Classify, Translate: Multi-Level E-Commerce Product Categorization via Machine Translation." Yundi Maggie Li, Stanley Kok, and Liling Tan. *Workshop on Information Technologies and Systems*, 2018.

- "Efficient Representation Learning for High-Dimensional Imbalance Data." Bilal Mirza, Zhiping Lin, Stanley Kok, Xiaoping Lai, Jiuwen Cao, and Jose Sepulveda. *IEEE International Conference on Digital Signal Processing*, 2016.

- "Multi-Layer Online Sequential Extreme Learning Machine for Image Classification." Bilal Mirza, Stanley Kok, and Fei Dong. *6th International Conference on Extreme Learning Machines*, 2015.

- "Language Modeling with Sum-Product Networks." Wei-Chen Cheng, Stanley Kok, Hoai Vu Pham, Hai Leong Chieu, and Kian Ming A. Chai. *15th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, 2014.

- "Collective Graph Identification." Galileo Namata, Stanley Kok, and Lise Getoor. *17th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2011.

- "Learning Markov Logic Networks Using Structural Motifs." Stanley Kok and Pedro Domingos. *27th International Conference on Machine Learning (ICML)*, 2010.

- "Hitting the Right Paraphrases in Good Time." Stanley Kok and Chris Brockett. *11th Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2010. **(Nominated for best paper.)**

- "Learning Markov Logic Network Structure via Hypergraph Lifting." Stanley Kok and Pedro Domingos. *26th International Conference on Machine Learning (ICML)*, 2009.

- "Extracting Product Information from Email Receipts using Markov Logic." Stanley Kok and Wen-Tau Yih. *6th Conference on Email and Anti-Spam (CEAS)*, 2009.

- "Extracting Semantic Networks from Text via Relational Clustering." Stanley Kok and Pedro Domingos. *19th European Conference on Machine Learning (ECML)*, 2008.

- "Statistical Predicate Invention." Stanley Kok and Pedro Domingos. *24th International Conference on Machine Learning (ICML)*, 2007.

- "Unifying Logical and Statistical AI." Pedro Domingos, Stanley Kok, Hoifung Poon, Matthew Richardson, and Parag Singla. *21st National Conference on Artificial Intelligence (AAAI)*, 2006.

- "Learning the Structure of Markov Logic Networks." Stanley Kok and Pedro Domingos. *22nd International Conference on Machine Learning (ICML)*, 2005.

- "Web-scale Information Extraction in KnowItAll (Preliminary Results)." Oren Etzioni, Michael Cafarella, Doug Downey, Stanley Kok, Ana-Maria Popescu, Tal Shaked, Stephen Soderland, Dan Weld, and Alexander Yates. *13th International Conference on the World Wide Web (WWW)*, 2004.

Book Chapters

- "Markov Logic: A Language and Algorithms for Link Mining." Pedro Domingos, Daniel Lowd, Stanley Kok, Hoifung Poon, Matthew Richardson, and Parag Singla. *Link Mining: Models, Algorithms and Applications*, edited by P. Yu, C. Faloutsos, and J. Han, Springer, 2010.

- "Markov Logic." Pedro Domingos, Stanley Kok, Hoifung Poon, Matthew Richardson, and Parag Singla. *Probabilistic Inductive Logic Programming* (pp. 92-117), edited by L. De Raedt, P. Frasconi, K. Kersting, and S. Muggleton, Springer, 2008.

- "Just Add Weights: Markov Logic for the Semantic Web." Pedro Domingos, Daniel Lowd, Stanley Kok , Hoifung Poon, Matthew Richardson, and Parag Singla. *Uncertain Reasoning for the Semantic Web I* (pp. 1-25), edited by P. C. G. Costa, C. d'Amato, N. Fanizzi, K. B. Laskey, K. J. Laskey, T. Lukasiewicz, M. Nickles, and M. Pool, Springer, 2008.

Workshop Publications

- "Synthetic Tabular Data Generation with Oblivious Variational Autoencoders: Alleviating the Paucity of Personal Tabular Data for Open Research." L Vivek Harsha Vardhan and Stanley Kok. ICML Workshop on Healthcare Systems, Population Health, and the Role of Health-Tech, 2020.

- "Generating Privacy-Preserving Synthetic Tabular Data Using Oblivious Variational Autoencoders." L Vivek Harsha Vardhan and Stanley Kok. ICML Workshop on Economics of Privacy and Data Labor, 2020.

- "Probabilistic Logic Graph Attention Networks for Reasoning." L Vivek Harshavardhan, Jia Guo, and Stanley Kok. *Deep Learning for Graphs Workshop (DL4G@WWW)*, 2020.

- "Unconstrained Product Categorization with Sequence-to-Sequence Models." Yundi Maggie Li, Liling Tan, Stanley Kok, and Ewa Szymanska. *SIGIR E-Commerce Data Challenge*, 2018. *(6th place out of 28 participants)*

- "Extracting New Facts and Relations in Knowledge Bases using Matrix Tri-Factorization." Tanmoy Mukherjee and Stanley Kok. *ICML Workshop on Structured Learning: Inferring Graphs from Structured and Unstructured Inputs*, 2013.

- "Integration of TV News Stories using Markov Logic." Stanley Kok. *AAAI Spring Symposium on Weakly Supervised Learning from Multimedia*, 2013.

- "Decision-Driven Models with Probabilistic Soft Logic." Stephen H. Bach, Matthias Broecheler, Stanley Kok, and Lise Getoor. *Neural Information Processing (NIPS) Workshop on Predictive Models in Personalized Medicine*, 2010.

- "Using Structural Motifs for Learning Markov Logic Networks." Stanley Kok and Pedro Domingos. *AAAI-2010 Workshop on Statistical Relational AI*, 2010.

- "Hypergraph Lifting for Structure Learning in Markov Logic Networks." Stanley Kok and Pedro Domingos. *International Workshop on Statistical Relational Learning*, 2009.

- "Markov Logic: A Unifying Language for Structural and Statistical Pattern Recognition." Pedro Domingos, Stanley Kok, Daniel Lowd, Hoifung Poon, Matthew Richardson, Parag Singla, Marc Sumner, and Jue Wang. *12th International Workshop on Structural and Syntactic Pattern Recognition (SSPR)*, 2008.

- "Toward Statistical Predicate Invention". Stanley Kok and Pedro Domingos. *ICML Workshop on Open Problems in Statistical Relational Learning*, 2006.

Technical Reports

- "The Alchemy System for Statistical Relational AI." Stanley Kok, Marc Sumner, Matthew Richardson, Parag Singla, Hoifung Poon, and Pedro Domingos. Department of Computer Science and Engineering, University of Washington, Seattle, WA. 2006-2017. http://alchemy.cs.washington.edu.