

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
- 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

- 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 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 NUS Jan–May 2020 (Student evaluation: 4.6/5)
And Investment 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

- Computational Methods for Business NUS Aug–Dec 2020
Analytics 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

- 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
- Organizing Committee Member
 - Tutorial Co-chair, Asian Conference on Machine Learning (ACML) 2012
- Senior Program Committee Member
 - International Joint Conference on Artificial Intelligence (IJCAI) 2020–21
 - Conference on Artificial Intelligence (AAAI) 2021
- Program Committee Member
 - Conference on Artificial Intelligence (AAAI) 2011–14, 2020
 - Conference on Neural Information Processing Systems (NeurIPS) 2019, 2020
 - Conference on Empirical Methods in Natural Lang. Processing (EMNLP) 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 Learning Representations (ICLR) 2021
 - Journal of IEEE Transactions on Engineering Management (TEM) 2020
 - International Conference on Information Systems (ICIS) 2020
 - Workshop on Information Technologies and Systems (WITS) 2020

- 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
- Chair of Faculty Recruitment Committee (SUTD’s ISTD Pillar) 2012–14

Professional Memberships

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

Funding

- *National Innovation Challenge (Chronic Disease Management) Grant*, Ministry of Health, \$333,332 (\$1.7 million to other participants), Jul 2019–Jun 2022
- *Start-up Grant (MOE Tier 1)*, National University of Singapore, Aug 2018–Aug 2021 \$180,000.
- *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, Jan 2013–Dec 2015 \$150,000.

Journal Publications

- “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

- “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 (DLAG@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>.