

Stephen W. Thomas

Smith School of Business, Queen's University
Goodes Hall, Kingston, ON K7L 3N6
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EDUCATION

- 2012 Ph.D., Computer Science, Queen's University
- 2009 MS, Computer Science, University of Arizona
- 2006 BS, Computer Science, New Mexico State University

SELECTED PROFESSIONAL EXPERIENCE

- Smith School of Business, Queen's University
 - 2021-present. Executive Director, Analytics and AI Ecosystem
 - 2018–2021. Director, Master of Management Analytics
 - 2018–2021. Director, Master of Management in Artificial Intelligence
 - 2013–present. Adjunct Assistant Professor
- Dataware Ventures
 - 2014–present. Board Member
 - 2013–2018. Chief Operations Officer
- SWT Analytics
 - 2013–2016. Founder and Principal
- School of Computing, Queen's University
 - 2009–2012. Research Assistant (Ph.D. Student)
- Raytheon Missile Systems, Operations Research
 - 2006–2009. Systems Engineer
- Los Alamos National Laboratory
 - 2005. Software Engineer (summer internship)

PUBLICATIONS

Journals

1. Chen, T., Thomas, S. W., Hemmati, H., Nagappan, M., and Hassan, A. E. (2017). An Empirical Study on the Effect of Testing on Code Quality Using Topic Models: A Case Study on Software Development Systems. *IEEE Transactions on Reliability*. 66(3): 806-824.
2. Chen, T., Shang, W., Nagappan, M., Hassan, A. E., and Thomas, S. W. (2016). Topic-based software defect explanation. *Journal of Systems and Software*. 129: 79-106.
3. Chen, T., Thomas, S. W., and Hassan, A. E. (2015). A survey on the use of topic models when mining software repositories. *Empirical Software Engineering*, 21(5): 1843-1919.
4. Barua, A., Thomas, S. W., and Hassan, A. E. (2014). What are developers talking about? An analysis of topics and trends in Stack Overflow. *Empirical Software Engineering* 19(3), 619–654.
5. Thomas, S. W., Adams, B., Hassan, A. E., and Blostein, D. (2014). Studying software evolution using topic models. *Science of Computer Programming* 80, 457–479.
6. Thomas, S. W., Hemmati, H., Hassan, A. E., and Blostein, D. (2014). Static test case prioritization using topic models. *Empirical Software Engineering* 19(1), 182–212.
7. Thomas, S. W., Snodgrass, R. T., and Zhang, R. (2014). Benchmark frameworks and tBench. *Software: Practice and Experience* 44(9), 1047–1075.
8. Thomas, S.W., Nagappan, M., Blostein, D., and Hassan, A.E. (2013). The impact of classifier configuration and classifier combination on bug localization. *IEEE Transactions of Software Engineering* 39(10), 1427–1443.
9. Currim, F., Currim, S., Dyreson, C., Snodgrass, R. T., Thomas, S.W., and Zhang, R. (2012). Adding temporal constraints to XML Schema. *IEEE Transactions on Knowledge and Data Engineering*.

Conference Proceedings

1. Ying, C. and Thomas, S.W. (2021). Improving Fairness in Credit Lending Models with Machine Learning. In: *Proceedings of the 2021 NeurIPS Workshops on Strategic Machine Learning*.
2. Bettenburg, N., Thomas, S. W., and Hassan, A. E. (2012). Using fuzzy code search to link code fragments in discussions to source code. In: *Proceedings of the 16th European Conference on Software Maintenance and Reengineering*.
3. Snodgrass, R. T., Gao, D., Zhang, R., and Thomas, S. W. (2012). Temporal support for Persistent Stored Modules. In: *Proceedings of the 28th International Conference on Data Engineering*.
4. Thomas, S.W. (2011). Mining software repositories with topic models. In: *Proceedings of the 33rd International Conference on Software Engineering*, pp.1138–1139.
5. Thomas, S.W., Adams, B., Hassan, A. E., and Blostein, D. (2011). Modeling the evolution of topics in source code histories. In: *Proceedings of the 8th Working Conference on Mining Software Repositories*, pp. 173–182.
6. Thomas, S. W., Adams, B., Hassan, A. E., and Blostein, D. (2010). Validating the use of topic models for software evolution. In: *Proceedings of the 10th International Working Conference on Source Code Analysis and Manipulation*, pp. 55–64. Winner: Most influential paper award, SCAM 2020.

Book Chapters

1. Snodgrass, R. T., Gao, D., Zhang, R., Thomas, S. W., and Dempsey, J. (2018). Temporal PSM. In: *Encyclopedia of Database Systems*. New York, NY: Springer.
2. Snodgrass, R. T., Thomas, S. W., and Zhang, R. (2018). tBench. In: *Encyclopedia of Database Systems*. New York, NY: Springer.
3. Dempsey, J., Snodgrass, R. T., Thomas, S. W., and Zhang, R. (2018). Temporal Benchmarks. In: *Encyclopedia of Database Systems*. New York, NY: Springer.
4. Thomas, S. W., Hassan, A. E., and Blostein, D. (2014). Mining unstructured software repositories. In: *Evolving Software Systems*, pp.139–162.

Theses

1. Thomas, S. W. (2012). Mining unstructured software repositories using IR models. *Ph.D. thesis*. School of Computing, Queen’s University.
2. Thomas, S. W. (2009). The implementation and evaluation of temporal representations in XML. *Master’s thesis*. Department of Computer Science, University of Arizona.

Case Studies and Essays

1. Thomas, S.W. (2019). Using Text Analytics to Predict Loan Defaults: Kiva. *Smith Living Case*.
2. Thomas, S.W. (2019). Assembling the AI Dream Team. *Smith Business Insight*.
3. Thomas, S.W. (2017). Advanced Analytics at SCENE. *Smith Living Case*.

Technical Reports

1. Thomas, S.W. (2012). Mining software repositories with topic models. *Technical report 2012-586*. School of Computing, Queen’s University.
2. Thomas, S. W., Snodgrass, R. T., and Zhang, R. (2010). tBench: Extending XBench with time. *Technical report TR-93*. TimeCenter.

COURSES TAUGHT

Commerce, Smith School of Business, Queen’s University

- *COMM 161: Introduction to Mathematical Analysis for Management*. Fall 2013.
- *COMM 492: Managing Data for Business Intelligence*. Winter 2014. Fall 2014. Fall 2015. Fall 2016. Fall 2017.

Master of Management Analytics, Smith School of Business, Queen’s University

- *MMA 865: Big Data*. 2017. 2018W. 2018S. 2019W. 2019S. 2021W. 2021S.
- *MMA 869: Machine Learning and AI*. 2019S. 2020W. 2021W. 2021S. 2022W. 2022S.

- *Workshop: Text Analytics and Sentiment Analysis*. 2015. 2016. 2017. 2018W. 2018S. 2019W.
- *Workshop: Advanced Topics in Machine Learning*. 2020S.

Master of Management in Artificial Intelligence, Smith School of Business, Queen's University

- *MMAI 869: Machine Learning and AI*. 2019. 2020. 2021. 2022.
- *MMAI 891: Natural Language Processing*. 2019. 2020. 2021.

Global Masters of Management Analytics, Smith School of Business, Queen's University

- *GMMA 869: Machine Learning and AI*. 2020. 2021.
- *GMMA 865: Big Data Analytics*. 2020.

Executive MBA Americas, Smith School of Business, Queen's University/Cornell University

- *NBAB5950-MBQC960: Big Data Analytics*. 2019. 2020. 2021.

Executive MBA, Smith School of Business, Queen's University

- *MBUS 865: Big Data and AI*. 2020.

Summer Enrichment Program, Smith School of Business, Queen's University

- *MBQC 960: Big Data Analytics*. 2019.

Master of Business Administration, Smith School of Business, Queen's University

- *MBAS 862: Topics in Analytics*. Fall 2021.
- *MBAS 862: Text Analytics*. Fall 2019. Fall 2020.

Queen's Executive Education

- *Text Analytics and Sentiment Analysis*. 2015-2016
- *Big Data and Text Analytics*. 2017-2020.
- *Digital Transformation*. 2019-2020.
- *AI Jumpstart for Managers*. 2020-

AWARDS AND HONORS

- 2021-2024. Distinguished Teaching Professorship. Smith School of Business.
- 2021. Professor of the Year Award, Smith Master of Management Analytics (Class of Summer 2021)
- 2021. Professor of the Year Award, Smith Master of Management Analytics (Class of Winter 2021)
- 2021. Professor of the Year Award, Smith Global Master of Management Analytics (Class of 2021)
- 2020. Professor of the Year Award, Smith Master of Management in Artificial Intelligence (Class of 2020)
- 2020. SCAM 2020 Most Influential Paper Award
- 2020. INFORMS George D. Smith Prize. Co-winner
- 2019. Professor of the Year Award, Smith Master of Management in Artificial Intelligence (Class of 2019)
- 2019. Professor of the Year Award, Smith Master of Management Analytics (Class of Summer 2019)
- 2019. Professor of the Year Award, Smith Master of Management Analytics (Class of Winter 2019)
- 2018. Professor of the Year Award, Smith Master of Management Analytics (Class of Summer 2018)
- 2018. Professor of the Year Award, Smith Master of Management Analytics (Class of Winter 2018)
- 2017. Professor of the Year Award, Smith Master of Management Analytics (Class of Summer 2017)
- 2016–present. Scotiabank Scholar, Smith School of Business, Queen's University
- 2009–2012. Queen's Graduate Award Scholarship, Queen's University
- 2009. Advanced Scholarship Program recipient, Raytheon Missile Systems
- 2009. Graduate Tuition Scholarship, University of Arizona
- 2004–2006. Dean's List, New Mexico State University
- 2004–2006. Crimson Scholar, New Mexico State University
- 2005–2006. Member, Pi Mu Epsilon, New Mexico State University

GRANTS

- 2021. Wellness AI project. Canada's Digital Technology Supercluster. With partners Lululemon and Wysdom.ai.

- 2021. Deeper Learning: Marketing, Personal Data and Privacy after Surveillance Capitalism. Office of the Privacy Commissioner of Canada. With David Marakami Wood and David Eliot.
- 2020. Machine Learning for Default Prediction of Private Pension Administration. Mitacs. With Ryan Riordan and Cecilia Ying.

MEDIA COVERAGE

- Lawson, Loraine. "Banks invest in AI with an eye towards ethics." *Bank Automation News*. [June 8, 2021](#).
- Lawson, Loraine. "Ethical AI: Experts say AI can be tapped for alternative credit scoring." *Bank Automation News*. [June 3, 2021](#).
- Israelson, David. "How data analytics transformed M&M Food Market." *Globe and Mail*. [February 11, 2020](#).
- Murray, Seb. "5 Ways Artificial Intelligence is Impacting MBA Students." *BusinessBecause*. [December 3, 2019](#).
- Eppel, Mike. "Affordable intelligence - AI for small business." *680 News*. [October 26, 2019](#).
- Murray, Seb. "Should I do a Specialized Business Master's Program?" *MiM Guide*. [June 14, 2019](#).
- Titleman, Naomi. "How to address the rise of AI technology in the world of work." *Globe and Mail*. [May 13, 2019](#).
- Titleman, Naomi. "Robot to human: Help me help you." *Globe and Mail*. [May 13, 2019](#).
- Toneguzzi, Mario. "Technology sector increasingly attractive for Calgary workers." *Calgary Business*. [March 12, 2019](#).
- Flexhaug, Dallas. "Energy workers turn to tech jobs." *Global News Morning*. *Global News*. [February 25, 2019](#).
- Rosa Saba. "Energy workers are willing to switch to tech, survey finds – and experts say it's time for Calgary to 'take the lead.'" *The Star Calgary*. [Feb 21, 2019](#).
- Whelan, Audrey. "How Calgarians can pivot their careers towards technology." *660 News Calgary*. [February 13, 2019](#).
- Lawrence, Daina. "Business and artificial intelligence come together in new program." *The Globe and Mail*. [December 20, 2018](#).
- "How Calgary can become an innovation hub." *Global News Radio*. *Newstalk 770 Calgary*. [November 2, 2018](#).
- Nilsson, Patrica. "Business schools bridge the artificial intelligence skills gap." *Financial Times*. [September 12, 2018](#).
- "... with Artificial Intelligence in Business?" *What on Earth is Going on?* [June 29, 2018](#).
- Mark, Corey. "Why Do A Master Of Management In Artificial Intelligence?" *BusinessBecause*. [June 7, 2018](#).
- "Is Artificial Intelligence really more dangerous than a nuke?" *The Morning Show*. *Global News*. [March 12, 2018](#).
- Ethier, Marc. "Queen's Launches 1st-Of-Its-Kind AI Degree." *Poets & Quants*. [March 12, 2018](#).
- "The First Master's Program in Artificial Intelligence." *Gormley*. *650 CKOM Saskatchewan*. [March 9, 2018](#).
- Greiner, Lynn. "IBM and Queen's University Smith School of Business unveil five-year partnership with the Cube." *Financial Post*. [March 24, 2017](#).

MEDIA COVERAGE – INTERNAL

- Klassen, Victoria. "Queen's Collaborates on Creating Accessible Wellness App." *Queen's Gazette*. [November 24, 2021](#).
- "Developing Leaders of Technology." *Smith Year in Review*. [August 31, 2021](#).
- Morantz, Alan. "AI Tools for Savvy Startups." *Smith Business Insight*. [July 12, 2021](#).
- "In AI, There are No Magical Unicorns." *Smith Business Insight*. [June 5, 2019](#).
- Montgomerie, Adrienne. "Hack the Language of Loan Defaults." *Smith Business Insight*. [April 2, 2019](#).
- Montgomerie, Adrienne. "Ping! Click! How One Mega-Mall Finds Its Big Data Edge." *Smith Business Insight*. [March 26, 2019](#).
- "Smith welcomes inaugural MMAI class." *Smith News*. [September 28, 2018](#).
- Gerlsbeck, Rob. "The AI Manager." *Smith Magazine*. [Summer 2018](#).
- Pabla, Jasnit. "Artificial Intelligence comes to the Smith School of Business." *The Queen's Journal*. [March 23, 2018](#).
- "Students look to solve global food security at Queen's challenge." *Smith News*. [December 12, 2017](#).

SELECTED PRESENTATIONS

Invited Presentations

- September 29, 2020. *AI Fairness*. Big Data and AI Conference. Toronto, ON.
- November 6, 2019. *The AI Gap: Building the Next Generation of Talent*. Panel member. SAS Analytics Roadshow. Toronto, ON, Canada.
- June 19, 2019. *Building the AI Dream Team*. Vector's AI for Executives. Toronto, ON, Canada.
- June 13, 2019. *The New Manager: The Growing Need for Analytics & AI Managers*. What AI Can Do to Drive Your Business Forward. HEC Montreal. Montreal, QB, Canada.
- June 12, 2019. *The New Manager: The Growing Need for Analytics & AI Managers*. Big Data and AI conference. Toronto, ON, Canada.
- May 3, 2019. *AI and Big Data*. Canadian University Board Association Conference. Kingston, ON, Canada.
- March 9, 2019. *AI Transforming Industry*. Panel moderator. Canadian Undergraduate Conference on Artificial Intelligence. Kingston, ON, Canada.
- March 6, 2019. *Machine Learning in the Financial Industry*. Panel member. CPA Ontario. Toronto, ON, Canada.
- December 10, 2018. *Building Analytics and AI Bench Strength*. SLF Analytics Conference. Toronto, ON, Canada.
- November 7, 2018. *AI and the Future of Extraction Industries*. Becoming Future Proof. Calgary, AB, Canada.
- August 28, 2018. *AI and Analytics for Business*. Disney Data & Analytics Conference 2018. Orlando, FL, USA.
- June 6, 2018. *Recommender Systems: Overview and Three Case Studies*. Smith/Vector Presents: AI for Execs. Toronto, ON, Canada.
- May 17, 2018. *AI and Analytics in Business*. Machine Learning & Artificial Intelligence Ottawa. Ottawa, ON, Canada.
- May 11, 2018. *Building the Next Generation of Analytics Talent*. Analytics by Design. Toronto, ON, Canada.
- May 2, 2018. *Advanced Analytics at SCENE*. Queen's Data Day. Kingston, ON, Canada.
- April 18, 2018. *Analytics and AI in Business*. Council for Chief Privacy Officers: Emerging Technologies and Privacy. Toronto, ON, Canada.
- October 23, 2017. *Machine Learning and Analytics*. Smith in Calgary (Alumni Event). Calgary, AB, Canada.
- September 6, 2017. *Artificial Intelligence*. Smith Graduate Student Consortium. Roundtable Discussion. Kingston, ON, Canada.
- July 24, 2017. *Harnessing the Power of Data Analytics within Your Organization*. Chief Learning Officer Exchange. Toronto, ON, Canada.
- June 1, 2017. *Sentiment Analysis: Opportunities, Challenges, and the Future*. Queen's Analytics Institute Workshop. Kingston, ON, Canada.
- April 19, 2017. *The Analytics Mindset*. Scotiabank's Finance Learning Day. Toronto, ON, Canada.
- March 13-14, 2017. *A Strategic Analytics Framework*. United Nations Data Innovations Lab Workshop. Nairobi, Kenya.
- November 7, 2012. *Effective bug localization*. IBM CASCON 2012. Markham, ON, Canada.
- October 15, 2012. *Mining unstructured data*. Panelist member. Mining Unstructured Data 2012. Kingston, ON, Canada.

Webinars and Podcasts

- April 15, 2021. *AI Jumpstart*. HOOPP Lunch and Learn Webinar.
- January 21, 2021. *7 Things Every Business Leader Needs to Know about AI*. Smith Insight.
- November 21, 2019. *AI in Small Business*. Smith Insight.
- March 13, 2019. *Chatbots: Technology and Trends*. [Smith Insight](#).
- September 11, 2018. *AI and Management Come Together in the Classroom at Queen's University*. [Big Data Beard Episode 42](#). (YouTube)
- July 3, 2018. *Recommender Systems: Overview and Case Studies*. [Smith Insight](#).
- May 17, 2018. *Building AI Bench Strength*. [Smith Insight](#).
- August 29, 2017. *Data Analytics: An Overview*. United Nations World Food Program ICT Workshop. Panama (Webinar).
- June 29, 2017. *Data Analytics: An Overview*. United Nations World Food Program ICT Workshop. Johannesburg, South Africa (Webinar).

Guest Lectures and Workshops

- March 3, 2020. *AI in Business*. Smith Executive MBA Alumni Event. Kingston, ON, Canada.
- September 12, 2019. *Introduction to NLP*. Queen's Law School. Kingston, ON, Canada.
- June 17, 2019. *Artificial Intelligence and Machine Learning – what is it all about?* Surveillance Studies Summer Seminar. Kingston, ON, Canada.
- May 15, 2019. *AI in Business*. Smith Executive MBA Alumni Event. Kingston, ON, Canada.
- April 2, 2019. *AI in Business*. Smith Centre for Social Impact. Kingston, ON, Canada.
- November 27, 2018. *Overview of AI and NLP*. Queen's Law School. Kingston, ON, Canada.

Conference Presentations

- August 20, 2012. *Mining unstructured software repositories*. Poster. MSR 2012 Vision. Kingston, ON, Canada.
- June 21, 2011. *Mining software repositories with topic models*. Poster. ICPC 2011. Kingston, ON, Canada.
- June 17, 2011. *Mining software repositories with topic models*. Poster. PASED 2011. Montreal, QB, Canada.
- May 23, 2011. *Mining software repositories with topic models*. ICSE 2011. Honolulu, HI, USA.
- May 22, 2011. *Modeling the evolution of topics in source code histories*. MSR 2011. Honolulu, HI, USA.
- September 12, 2010. *Validating the use of topic models for software evolution*. SCAM 2010. Timisoara, Romania.

Other

- October 18, 2019. *AI in Business*. Queen's Homecoming Event. Kingston, ON, Canada.
- June 11, 2019. *AI in Business*. Proof Lunch and Learn. Toronto, ON, Canada.
- May 7, 2019. *AI and Smith*. Presentation to the Smith Global Council. New York, NY, USA.
- February 4, 2019. *AI and Smith*. Presentation to the Smith Global Council. London, UK.
- November 30, 2012. PhD thesis defense. *Mining unstructured software repositories using IR models*. Kingston, ON, Canada.
- December 9, 2011. Presentation for School of Computing Open House. *Effective bug localization*. Kingston, ON, Canada.
- December 10, 2010. Presentation for School of Computing Open House. *Statistical topic models*. Kingston, ON, Canada.
- March 6, 2009. Master's thesis defense. *The implementation and evaluation of temporal representations in XML*. Tucson, AZ, USA.

ACADEMIC SERVICE

- Member, Analytics By Design Advisory Board, 2019–
- Member, Queen's University Alternative Assets Fund (QUAAF) Executive Board, 2019–
- Executive Advisor, Analytics By Design, 2018–2019
- Member, Queen's MMAI Faculty Development Fund committee, 2018–2020
- Member, Queen's Master of Management Analytics Curriculum Review Committee. 2017.
- Member, Smith Analytics and AI Advisory Board. 2016–
- Conference Reviewer: MSR Challenge 2013
- Journal co-reviewer: IEEE Transactions on Software Engineering, Software: Practice and Experience
- Conference co-reviewer: MSR Challenge 2012, MSR 2012, ICSE 2012, CASCON 2011, WCRE 2011, ESEM 2011, MSR 2011, ICSM 2010, WCRE 2010, GI 2010, MSR 2010

STUDENT SUPERVISION

PhD

- Supervisor, Cecilia Ying. *Topic in Language Models*. 2020–

MSc

- Supervisor, Cecilia Ying. *Improving the Classification Parity of Machine Learning Models through Subgroup Threshold Optimization*. 2019 – 2020.
- External examiner, Julianne Jakobek. *You Are Never Alone with a Robot: A Qualitative Content Analysis on the Use of Anthropomorphic Technologies*. 2019.

- External examiner, Kristopher Jones. *Toward a Political Sociology of Blockchain*. 2018.
- Co-supervisor, Amir Emami Gohari. *Interpretation of Black-box Models*. 2017.

Research Assistant

- Supervisor, Amir Hossini, Queen's Supercluster Project. 2021.
- Co-supervisor, Arnoosh Golestanian, Conflict Analytics Lab. 2019.
- Co-supervisor, Karandeep Singh. Analytics at iTrade. 2019.
- Co-supervisor, Neal Gilmore. Conflict Analytics Lab. 2019.
- Co-supervisor, Ross Couldrey. Analytics at iTrade. 2018-2019.
- Supervisor, Imad Ghani. Conflict Analytics Lab. 2018-2019.
- Supervisor, Sargon Morad. Analytics and AI at Oxford Properties. 2018-2019
- Supervisor, Sarah Scott. Analytics at SCENE. 2018
- Co-supervisor, Arnoosh Golestanian, Analytics and AI at BGIS. 2018
- Supervisor, Yue Zhou. Analytics at SCENE. 2017-2018
- Supervisor, Ninad Parab. Analytics at SCENE. 2017

PROFESSIONAL AFFILIATIONS

- 2020–present. Member, INFORMS
- 2010–present. Member, ACM Special Interest Group on Software Engineering (SIGSOFT)
- 2008–present. Member, Association for Computing Machinery (ACM)
- 2008–present. Member, Institute of Electrical and Electronics Engineers (IEEE)

RESEARCH AFFILIATIONS

- Data Scientist, The Conflict Analytics Lab. 2018–
- Research Scholar, the Scotiabank Centre for Customer Analytics. 2016–

ONLINE PROFILES

- Smith: https://smith.queensu.ca/faculty_and_research/faculty_list/stephen_thomas.php
- DBLP: http://dblp.uni-trier.de/pers/hd/t/Thomas:Stephen_W=
- Google Scholar: <https://scholar.google.ca/citations?user=Q8d6QLIAAAAJ&hl=en>
- LinkedIn: <https://www.linkedin.com/in/stepthom>
- GitHub: <https://github.com/stepthom>
- DrivenData: <https://www.drivendata.org/users/stepthom>

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