

James McInerney

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Summary

10+ years of experience in developing state-of-the-art statistical machine learning methods for dynamic, noisy, high-dimensional, partially-missing datasets with expertise in tech transfer to a wide variety of business applications. My areas of interest center around principled Bayesian approaches and their scalable approximation with variational inference, bandits & reinforcement learning, causal analysis. Throughout, I have led and collaborated on publications at top tier machine learning and artificial intelligence conferences, and have been an active member of the research community.

Experience

May 2019– *Senior Research Scientist, **Netflix***, Los Gatos, CA. (*New York City 2023–*)

- Made fundamental methodological contributions to epistemic uncertainty for large-scale models, variational inference for temporal point processes for inferring user satisfaction, machine learning for systems (ML4Sys).
- Generative modeling and simulation methods for personalization. Research advisory on bandits and causal machine learning for launching new content.

Nov 2018 – *Tech Lead, **Spotify***, New York, N.Y.

Apr 2019

- Developed machine learning strategy for tech research (opportunities for machine learning in R&D) and engineering (homepage personalization).

Jan 2018 – *Senior Research Scientist, **Spotify***, New York, N.Y.

Oct 2018

- Developed methodologies in counterfactual evaluation for offline evaluation and optimization. (See publications.)
- Led the creation of a machine learning bootcamp for 15 instructors to teach internal engineers, data scientists, and researchers. *Outcomes*: course ran iterations in New York, Boston, and Stockholm and taught over 120 people in diverse teams across user engagement, creator, data, and revenue.

Dec 2016 – *Research Scientist, **Spotify***, New York, N.Y.

Dec 2017

- Led the initiative to research and develop a contextual bandit recommender system on the home page. *Outcomes*: system deployed to 180M users, patent application, & academic publication.

Aug 2017 – *Adjunct Professor, **Columbia University***, New York, N.Y.

Jan 2018

- Designed and taught the *Machine Learning* course for 110 Master's students and 20 remote students (directing lectures, 1:1 mentoring, assignments, marking, exams, online Q&A). Built and managed a team of 7 teaching assistants.
- 2017 Creator, Data Science Bootcamp, **Columbia University**, New York, N.Y.
- Created and delivered a 1 week data science bootcamp to introduce 35 doctoral students across science to machine learning and data science.
- 2014-2016 Postdoctoral Researcher, **Columbia University**, New York, N.Y.
- Developed a scalable probabilistic machine learning inference algorithm for streaming data, applied to large spatio-temporal and natural language datasets.
 - Advanced the state-of-the-art in recommender systems to perform recommendations over time and a causal approach to recommendation.
- 2014 Postdoctoral Researcher, **Princeton University**, Princeton, N.J.
- Developed a Bayesian machine learning approach to identify structure in social media natural language, with applications to event detection on Twitter.
- 2012-2013 Scientific Contractor, **BAE Systems**, Bristol, U.K.
- Technology transfer from my PhD work to industry. Developed prototypes for spatio-temporal outlier detection and decentralized mobile networks.
- 2010 Research Intern, **Technical University of Delft**, Delft, Netherlands.
- Internship with the Pattern Recognition group to develop a machine learning model to infer human intentions from spatio-temporal data.

Education

Degrees

- 2011-2014 PhD in Computer Science, **University of Southampton**, U.K.
- Main topics of interest were Bayesian machine learning algorithms and models, spatio-temporal models, reinforcement learning, and algorithmic game theory.
 - Research covered in the media by [New Scientist](#), [Nature Magazine](#), [The Economist](#).
- 2009-2010 MSc in Computing (Artificial Intelligence), **Imperial College London**, U.K.
- 2002-2005 MA in Computer Science (2:1), **Oxford University**, U.K.

Additional Courses

- 2012 Machine Learning Summer School, La Palma, Canary Islands.
- 2011 Summer School in Multi-Agent Systems, Girona, Spain.
- 2009 Research-to-Industry Technology Transfer, Oxford University research commercialization office, Oxford, U.K.

Honors & awards

- 2013 Finalist, Orange Data for Development Challenge
- 2012 Winner, Tag Challenge by U.S. State Department
- 2012 Finalist, Nokia Mobile Data Challenge
- 2012 Winner, Entrepreneurship Challenge by University of Southampton
- 2010 Research Internship Grant, IDEA League
- 2010 Finalist, Entrepreneurship Challenge by Imperial Entrepreneurs
- 2002-2005 Full academic scholarship, Oxford University

Selected publications

Full publication list at <http://jamesmc.com/publications>.

Journal articles

- 2018 D. Liang, L. Charlin, J. McInerney, D. Blei. Modeling User Exposure in Recommendation. *Journal of Machine Learning Research (JMLR)*. Under review.
- 2013 J. McInerney, S. Stein, A. Rogers, N. R. Jennings. Breaking the Habit: Measuring and Predicting Departures from Routine in Individual Human Mobility. *Journal of Pervasive and Mobile Computing*, 9, (6), 808-822.
- 2013 A. Rutherford, M. Cebrian, I. Rahwan, S. Dsouza, J. McInerney, V. Naroditskiy, M. Venanzi, N. R. Jennings, J.R. deLara, E. Wahlstedt, S. U. Miller. Targeted social mobilization in a global manhunt. *PLoS ONE*, 8, (9), e74628.

Conference peer reviewed

- 2019 A. Gruson, P. Chandar, C. Charbuillet, J. McInerney, S. Hansen, D. Tardieu, B. Carterette. Offline Evaluation to Make Decisions About Playlist Recommendation. In *ACM International Conference on Web Search and Data Mining (WSDM)*. Melbourne, Australia. In press.
- 2018 J. McInerney, B. Lacker, S. Hansen, K. Higley, H. Bouchard, A. Gruson, R. Mehrotra. Explore, Exploit, Explain: Personalizing Explainable Recommendations with Bandits. In *ACM Conference on Recommender Systems (RecSys)*. Vancouver, Canada. *Acceptance rate: 18%*
- 2018 R. Mehrotra, J. McInerney, H. Bouchard, M. Lalmas, F. Diaz. Towards a Fair Marketplace: Counterfactual Evaluation of the Trade-Off Between Relevance, Fairness & Satisfaction in Recommender Systems. In *ACM International Conference on Information and Knowledge Management (CIKM) Industry and Case Study Track*. Turin, Italy. *Acceptance rate: 26%*
- 2017 J. McInerney. An Empirical Bayes Approach to Optimizing Machine Learning Algorithms. In *Conference on Neural Information Processing Systems (NIPS)*. Long Beach, California, USA. Spotlight presentation. *Acceptance rate: 18%*
- 2016 D. Liang, L. Charlin, J. McInerney, D. M. Blei. Modeling user exposure in recommendation. In *International World Wide Web Conference (WWW)*. Montreal, Quebec, Canada.
- 2015 J. McInerney, R. Ranganath, D. M. Blei. The population posterior and Bayesian modeling on streams. In *Conference on Neural Information Processing Systems (NIPS)*. Montreal, Quebec, Canada. *Acceptance rate: 22%*

- 2013 N. Truong, J. McInerney, L. Tran-Thanh, E. Costanza, S. Ramchurn. Forecasting multi-appliance usage for smart home energy management. In *International Joint Conference on Artificial Intelligence (IJCAI)*. Beijing, China. Oral presentation. *Acceptance rate: 28%*.
- 2013 J. McInerney, A. Rogers, N. R. Jennings. Learning periodic human behaviour models from sparse data for crowdsourcing aid delivery in developing countries. In *Conference on Uncertainty in Artificial Intelligence (UAI)*. Bellevue, Washington, US. Oral presentation. *Acceptance rate: 11%*
- 2013 J. McInerney, J. Zheng, A. Rogers, N. R. Jennings. Modelling heterogeneous location habits in human populations for location prediction under data sparsity. In *International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)*. Zurich, Switzerland. Oral presentation. *Acceptance rate: 18%*.

Service & Outreach

- 2018 Advisory Committee for Symposium on Advances in Approximate Bayesian Inference
- 2018 Committee for Alignment of Machine Learning Models in User Engagement at Spotify
- 2018 Organizing Committee for Machine Learning Day at Spotify, Stockholm, Sweden
- 2016-2017 Reviewer for Journal of Machine Learning Research (JMLR)
- 2016 Reviewer for Machine Learning Journal
- 2015-2017 Organizing Committee for Approximate Bayesian Inference workshop at NIPS
- 2013-2018 Program Committee most years for conferences NIPS, ICML, AISTATS, IJCAI, AAAI, UbiComp, WWW, AAMAS, IEEE Signal Processing Advances in Wireless Communications (SPAWC), Mobile and Ubiquitous Multimedia (MUM).
- 2014-2016 Statistical Machine Learning Reading Group organizer at Columbia University

Supervising Research Interns

- 2017 Massimo Caccia, *Annealing Variational Autoencoders*
- Annealing approaches for variational autoencoders.
- 2015 Chenzhe Qian, *Correlated Mobility Habits*
- Model correlations between latent mobility habits using correlated topic models.
- 2015 Gaurav Ragtah, *Collaborative Filtering with Attribution Error*
- Statistical learning methods to jointly model user preferences and sensor noise to disambiguate user-item interactions under noisy conditions.
- 2013 Stanislav Michaylov, *A System for Disaster Response Mobile Coordination*
- Mobile coordination system for multiple agents in disaster response situations.

Invited and Contributed Talks

- 2018 Conference on Recommender Systems (RecSys), Vancouver, B.C., Canada
- Counterfactual training & evaluation of contextual bandit recommenders.
- 2018 Microsoft Research Data Science Summer School, New York, NY, U.S.
- Tutorial introduction to clustering methods.
- 2018 Spotify Machine Learning Day, Stockholm, Sweden

- Counterfactual training & evaluation of contextual bandit recommenders.
- 2017 Neural Information Processing Systems (NIPS), Long Beach, CA, U.S.
 - Spotlight talk on empirical Bayes approaches to hyperparameter optimization in machine learning algorithms.
- 2016 Workshop on Advances in Approximate Bayesian Inference, NIPS, Barcelona, Spain
 - On hyperparameter optimization in machine learning algorithms.
- 2016 Google Research, New York City, NY, U.S.
 - Machine learning methods for spatio-temporal data.
- 2016 Disney Research, Pittsburgh, PA, U.S.
 - Machine learning methods for spatio-temporal data.
- 2016 Gamalon Labs, Cambridge, MA, U.S.
 - Bayesian machine learning on streaming data.
- 2015 Probabilistic Programming and Advanced Machine Learning DARPA meeting, Portland, OR, U.S.
 - Bayesian machine learning on streaming data.
- 2015 Text Analysis Conference, Princeton University, Princeton, NJ, U.S.
 - Identifying events in social media natural language probabilistic machine learning.
- 2015 Department of Engineering, Oxford University, Oxford, U.K.
 - Bayesian machine learning on streaming data.
- 2015 Big Data Workshop, Fields Institute, Toronto, Canada
 - Bayesian machine learning on streaming data.
- 2014 Google DeepMind, London, U.K.
 - Active learning at scale with variational inference.
- 2014 Machine Learning Group, Cambridge University, Cambridge, U.K.
 - Active learning at scale with variational inference.
- 2014 School of Computer Science, Birmingham University, Birmingham, U.K.
 - Machine learning methods for spatio-temporal data.
- 2013 International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), Zurich, Switzerland, U.S.
 - Hierarchical Dirichlet process for spatio-temporal transfer learning.
- 2013 Placed Inc., Seattle, WA, U.S.
 - Machine learning methods for spatio-temporal data.
- 2013 Conference on Uncertainty in Artificial Intelligence (UAI), Bellevue, WA, U.S.
 - Reinforcement learning with periodic data.
- 2013 Conference on the Analysis of Mobile Phone Datasets (NetMob), Boston, MA, U.S.
 - Reinforcement learning with periodic data.
- 2013 Advanced Technology Centre (ATC), BAE Systems plc, Filton, U.K.
 - Machine learning methods for spatio-temporal data.
- 2012 International Workshop on Location-Based Social Networks (LBSN), Pittsburgh, PA, U.S.
 - Transfer learning from mobility data.
- 2012 Mobile Data Challenge by Nokia Workshop, Newcastle, U.K.
 - Outlier detection from mobility data.
- 2011 Department of Electronics and Computer Science, Politecnico di Milano, Milan, Italy
 - Mobile data analysis.

References

Available upon request.