Dawen Liang

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http://dawenl.github.io

WORKING EXPERIENCE

Senior Research Scientist, Netflix 2016.7 – present
Discovery Science & Algorithms
- Improve personalization and recommendations.
- Conduct exploratory data analysis in various domains.

Graduate Research Assistant, Columbia University 2012.9 – 2016.6
Laboratory for the Recognition and Organization of Speech and Audio (*LabROSA*)
Conduct research on:
- Statistical machine learning and applications to music understanding.
- User behavior modeling and recommender systems.

Recommendation Systems Scientist Intern, Pandora Radio 2015.5 – 2015.8
Playlist Team Mentors: Dr. Erik Schmidt and Dr. Keki Burjorjee
- Investigate hybrid approaches to collaborative filtering with both user feedback and music content.

Research Intern, Adobe Systems Incorporated Summer 2013, 2014
Adobe Creative Technology Laboratory Mentors: Dr. Matt Hoffman and Dr. Gautham Mysore
- Work on novel Bayesian hierarchical Product-of-Filters model of audio.
- Explore statistical model based approach to speech denoising and dereverberation.

Research Assistant, Carnegie Mellon University 2010.9 – 2012.5
Computer Music Group
- Work on *Human Computer Music Performance* project and related Machine Learning/Music Information Retrieval research with Prof. Roger Dannenberg.

Software Development Engineer Intern, Amazon.com 2011.5 – 2011.8
Kindle – Digital Delivery Team
- Design and implement an efficient scheduling algorithm for periodicals delivery (deployed in production).

EDUCATION

Columbia University, New York, NY 2012.9 – 2016.6
Ph.D. in *Electrical Engineering*
Advisor: Prof. Dan Ellis and Prof. David Blei
Thesis: Understanding music semantics and user behavior with probabilistic latent variable models

Carnegie Mellon University, Pittsburgh, PA 2010.9 – 2012.5
M.S. in *Music and Technology*

Fudan University, Shanghai, China 2006.9 – 2010.6
B.S. in *Computer Science*

AWARDS

Best reviewer award, Neural Information Processing Systems (NIPS), 2017

Best poster presentation award, New York Academy of Sciences Machine Learning Symposium 2016
- For "Modeling User Exposure in Recommendation".

Best poster presentation award, International Society for Music Information Retrieval (ISMIR), 2014

- For "mir_eval: A Transparent Implementation of Common MIR Metrics".

Student Travel Grant, International Society for Music Information Retrieval (ISMIR), 2014

Best student paper award, International Society for Music Information Retrieval (ISMIR), 2013
- For "Beta Process Sparse Nonnegative Matrix Factorization for Music".

PUBLICATIONS

Peer-reviewed Journal articles

- *Methods and Prospects for Human Computer Performance of Popular Music*, Roger B. Dannenberg, Nicolas E. Gold, **Dawen Liang**, Guangyu Xia, in *Computer Music Journal*, 38(2):36-50, 2014.
- *Active Scores: Representation and Synchronization in Human-Computer Performance of Popular Music*, Roger B. Dannenberg, Nicolas E. Gold, **Dawen Liang**, Guangyu Xia, in *Computer Music Journal*, 38(2):51-62, 2014.

Peer-reviewed Conference papers and selected Workshop contributions

- *Correlated Variational Auto-Encoders*, Da Tang, **Dawen Liang**, Tony Jebara, Nicholas Ruozzi, in *International Conference on Machine Learning* (ICML), 2019.
- *Variational Autoencoders for Collaborative Filtering*, **Dawen Liang**, Rahul G. Krishnan, Matthew D. Hoffman, Tony Jebara, in *The Web Conference* (WWW), 2018.
- *On the Challenges of Learning with Inference Networks on Sparse, High-dimensional Data*, Rahul G. Krishnan, **Dawen Liang**, Matthew D. Hoffman, in *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics* (AISTATS), 2018.
- *Causal Inference for Recommendation*, **Dawen Liang**, Laurent Charlin, David M. Blei, in *UAI Workshop on Causation: Foundation to Application*, 2016.
- *Factorization Meets the Item Embedding: Regularizing Matrix Factorization with Item Co-occurrence*, **Dawen Liang**, Jaan Altosaar, Laurent Charlin, David M. Blei, in *Proceedings of the 10th ACM Conference on Recommender Systems* (RecSys), 2016.
- *Modeling User Exposure in Recommendation*, **Dawen Liang**, Laurent Charlin, James McInerney, David M. Blei, in *Proceedings of the 25th International Conference on World Wide Web* (WWW), 2016.
- *Content-Aware Collaborative Music Recommendation Using Pre-trained Neural Networks*, **Dawen Liang**, Minshu Zhan, and Daniel P. W. Ellis, in *Proceedings of the 16th International Society for Music Information Retrieval* (ISMIR), 2015.
- *Landmarking Manifolds with Gaussian Processes*, **Dawen Liang** and John Paisley, in *International Conference on Machine Learning* (ICML), 2015.
- *librosa: Audio and Music Signal Analysis in Python*, Brian McFee, Colin Raffel, **Dawen Liang**, Daniel P. W. Ellis, Matt McVicar, Eric Battenberg, and Oriol Nieto, in *Proceedings of the 14th Python in Science Conference* (SciPy), 2015.
- *Speech Dereverberation using a Learned Speech Model*, **Dawen Liang**, Matthew D. Hoffman, and Gautham J. Mysore, in *IEEE International Conference on Acoustics, Speech and Signal Processing* (ICASSP), 2015.
- *Beta Process Non-negative Matrix Factorization with Stochastic Structured Mean-Field Variational Inference*, **Dawen Liang** and Matthew D. Hoffman, in *NIPS Workshop on Advances in Variational Inference*, 2014.
- *Codebook-based Scalable Music Tagging with Poisson Matrix Factorization*, **Dawen Liang**, John Paisley, and Daniel P. W. Ellis, in *Proceedings of the 15th International Society for Music Information Retrieval* (ISMIR), 2014.
- *mir_eval: A Transparent Implementation of Common MIR Metrics*, Colin Raffel, Brian McFee, Eric J. Humphrey, Justin Salamon, Oriol Nieto, **Dawen Liang**, and Daniel P. W. Ellis, in *Proceedings of the 15th International Society for Music Information Retrieval* (ISMIR), 2014.

- *Speech Decoloration based on the Product-of-Filters Model*, **Dawen Liang**, Daniel P. W. Ellis, Matthew D. Hoffman, and Gautham J. Mysore, in *IEEE International Conference on Acoustics, Speech and Signal Processing* (ICASSP), 2014.
- *A Generative Product-of-Filters Model of Audio*, **Dawen Liang**, Matthew D. Hoffman, and Gautham J. Mysore, in *Proceedings of the International Conference on Learning Representations* (ICLR), 2014.
- *Beta Process Sparse Nonnegative Matrix Factorization for Music*, **Dawen Liang**, Matthew D. Hoffman, and Daniel P. W. Ellis, in *Proceedings of the 14th International Society for Music Information Retrieval* (ISMIR), 2013 (**Best Student Paper Award**).
- *Segmentation, Clustering, and Display in a Personal Music Database for Musicians*, Guangyu Xia, **Dawen Liang**, Roger B. Dannenberg, and Mark J. Harvilla, in *Proceedings of the 12th International Society for Music Information Retrieval* (ISMIR), 2011.
- *A Framework for Coordination and Synchronization of Media*, **Dawen Liang**, Guangyu Xia, and Roger B. Dannenberg, in *Proceedings of the 11th International Conference on New Interfaces for Musical Expression* (NIME), 2011.

PROFESSIONAL SERVICES

Reviewer: AISTATS, ICLR, ICML, IJCAI, ISMIR, NeurIPS

- Top reviewers: NeurIPS (2017, 2018), ICML (2019)

Invited talks:

- SDM Workshop on Machine Learning Methods for Recommender Systems, 2018
- NeurIPS Workshop on Advances in Approximate Bayesian Inference, 2017
- ICML Workshop on Machine Learning for Music Discovery, 2016

Organizer:

- Symposium on Advances in Approximate Bayesian Inference (AABI) 2018, 2019

TEACHING EXPERIENCE

Teaching Assistant

- ELEN E4903 Machine Learning, Columbia University, Spring 2016.
- EECS E6892 Bayesian Models for Machine Learning, Columbia University, Spring 2014, Fall 2015.
- COMS W4721 Machine Learning for Data Science, Columbia University, Spring 2015.
- ELEN E4810 Digital Signal Processing, Columbia University, Fall 2012, Fall 2013.
- 15-323 Computer Music Systems and Information Processing, Carnegie Mellon, Spring 2012.
- 15-322 Introduction to Computer Music, Carnegie Mellon, Spring 2011.

SKILLS

Languages	Python (Numpy/Scipy), R, MATLAB, Java, C/C++, GO, SQL
Software	Vim, Eclipse, Xcode, Weka, Hadoop
Experience	Object-oriented programming and unit tests; TCP/IP, network programming, and concurrency programming; familiar with Windows/Mac OS/Linux development environment.

REFERENCES

Available upon request