Yan Liu

CONTACT INFORMATION

Computer Science Department
941 Bloom Walk SAL 216
University of Southern California
Los Angeles, CA 90089 USA

Office: SAL 216
Phone: (213)740-4371
E-mail: yanliu.cs@usc.edu
Webpage: `http://www-bcf.usc.edu/~liu32`

RESEARCH INTERESTS

Developing machine learning algorithms for analyzing large-scale time-series and spatial time-series data, text data, structured input/output data, and multi-sourced data with applications to climate, social media and biology applications.

EDUCATION

Ph.D., **Carnegie Mellon University**, May. 2007
School of Computer Science. Advisor: Prof. Jaime Carbonell
Thesis: Conditional Graphical Models for Protein Structure Prediction

M.Sc., **Carnegie Mellon University**, May. 2004
School of Computer Science

B.S., **Peking University**, Beijing, China, Jul. 2001
Department of Computer Science and Technology

EMPLOYMENT

University of Southern California — Log Angeles, CA, USA
Assistant Professor — Aug 2010 – Present
Computer Science Department, Viterbi School of Engineering

IBM T.J. Watson Research Center — Yorktown Heights, NY, USA
Research Staff Member — Nov 2006 – Aug 2010
Machine Learning Group, Math Science and Business Analytics Department

AWARDS AND HONORS

Biocom Catalyst Award Winner 2017
Adobe Faculty Award 2017
IBM Faculty Award 2015
Facebook Faculty Award 2015
NSF CAREER Award 2013
Okawa Foundation Award 2013
Yahoo Faculty Research & Engagement Award 2011, 2015
James H. Zumberge Research and Innovation Fund Individual Award 2011
Best Paper Finalist of IEEE Conference on Data Mining 2011
ACM Doctoral Dissertation Award Honorable Mention 2007
Best Paper Award in SIAM Conference on Data Mining 2007

Team Member of Winner of KDD Cup 2009 on Fast Scoring on a Large Marketing Database
Team Member of Winner of KDD Cup 2008 on Early Detection of Breast Cancer
Team Member of Winner of INFORMS 2008 Data Mining Competition
Team Lead of Winner of KDD Cup 2007 on Netflix Movie Rating Prediction

Research

JOURNAL PUBLICATION

J1. S. Purushotham, C. Meng, Z. Che, Y. Liu. **Benchmarking Deep Learning Models on Large Healthcare Datasets**. To Appear in *Journal of Biomedical Informatics*.

J2. R. Yu, H. Qiu, Z. Wen, C.-Y. Lin, Y. Liu. **A Survey on Social Media Anomaly Detection**. *ACM SIGKDD Explorations*, 2016.

J3. R. Yu, Y. Liu. **Spatio-Temporal Analysis of Social Media Data**. *Encyclopedia of GIS*, 2016.

J4. V. Pham, C. Shahabi, Y. Liu. **An Entropy-Based Model to Infer Social Strength from Spatiotemporal Data**. To appear in *ACM Transactions on Database Systems (TODS)*.

J5. Y. Liu. **Scalable Multivariate Time Series Models for Climate Informatics**. *Computing in Science & Engineering/IEEE Intelligent Systems (CiSE) Magazine*, 2015.

J6. R. Yu, H. Xin, Y. Liu. **GLAD: Group Anomaly Detection in Social Media Analysis**. *Transactions on Knowledge Discovery from Data (TKDD)*, 10(2):Article No. 18, 2015.

J7. F. Liu, S. Chakraborty, F. Li, Y. Liu, A. C. Lozano. **Bayesian Regularization via Graph Laplacian**. *Journal of Bayesian Statistics*, 9(2): 449-474, 2014.

J8. W. Li, S. Kang, C. Liu, S. Zhang, Y. Shi, Y. Liu, X. Zhou. **High-resolution Functional Annotation of Human Transcriptome: Predicting Isoform Functions by a Novel Multiple Instance-based Label Propagation Method**, *Nucleic Acids Research*, 42(6):e39, 2014.

J9. Y. Chang, L. Tang, Y. Inagaki, Y. Liu. **What is Tumblr: A Statistical Overview and Comparison**. *SIGKDD Explorations*, 16(1): 21-29, 2014.

J10. G.A. Burns, Y. Gil, N. Villanueva-Rosales, Y. Liu. **The AAAI Fall Symposium on Discovery Informatics: AI Takes a Science-Centered View on Big Data**. *AI Magazine*, 35(2). 2014.

J11. M. T. Bahadori, Y. Liu, D. Zhang, **A General Framework for Scalable Transductive Transfer Learning**, *Knowledge and Information Systems (KAIS)*, (38):1-61-83, 2013.

J12. Y. Chang, A. Dong, P. Kolari, R. Zhang, Y. Inagaki, F. Diaz, H. Zha, Y. Liu. **Improving Recency Ranking Using Twitter Data**. *ACM Transactions on Intelligent Systems and Technology (ACM TIST)*, 4(1): Article No. 4. 2013.

J13. Y. Liu, A. Niculescu-Mizil, A. Lozano, Y. Lu. **Temporal Graphical Models for Cross-Species Gene Regulatory Network Discovery**. *J Bioinform Comput Biol*, **9**(2):231-50, 2011.

J14. J. Sun, Y. Liu, J. Tang, C. Apte. **Introduction to Special Issue on Large-Scale Data Mining**. *Transactions on Knowledge Discovery from Data (TKDD)* **5**(2):7, 2011.

J15. S. Rosset, C. Perlich, G. Swirszcz, P. Melville, Y. Liu. **Medical Data Mining: Insights from Winning Two Competitions**. *Data Min. Knowl. Discov.* **20**(3): 439-468, 2010.

J16. Y. Liu, J. Carbonell, V. Gopalakrishnan, P. Weigele. **Conditional Graphical Models for Protein Structural Motif Recognition**. *Journal of Computational Biology.* **16**(5):639-57, 2009.

J17. J. Yang, R. Yan, Y. Liu, E. P. Xing. **Harmonium Models for Video Classification**. *Journal of Statistical Analysis and Data Mining*, **1**(1), 23-37, February 2008.

J18. C. Perlich, P. Melville, Y. Liu, G. Swirszcz, R. Lawrence. **Winner Report: KDD CUP Breast Cancer Identification**. *SIGKDD Explorations.* **10**(2): 39-42, 2008.

J19. Y. Liu, Z. Kou. **Predicting Who Rated What in Large-Scale Datasets**. *SIGKDD Explorations.* **9**(2): 62-65, 2007.

J20. S. Rosset, C. Perlich, Y. Liu. **Making the Most of Your Data: KDD Cup 2007 "How Many Ratings" Winners Report**. *SIGKDD Explorations.* **9**(2): 66-69, 2007.

J21. Y. Liu, J. Carbonell, J. K. Seetharaman, V. Gopalakrishnan. **Comparison of Probabilistic Combination Methods for Protein Secondary Structure Prediction.** *Bioinformatics.* **20**(17):3099-107.

J22. Y. Liu, J. Carbonell, P. Weigele, V. Gopalakrishnan. **Protein Fold Recognition Using Segmentation Conditional Random Fields**. *Journal of Computational Biology.* **13**(2):394-406.

J23. R. Ghani, K. Probst, Y. Liu, M. Krema, A. Fano. **Text Mining to Extract Product Attributes**. *SIGKDD Explorations.* **8**(1): 41-48, 2006.

Book Chapter

B1. Z. Che, S. Purushotham, D. C. Kale, W. Li, M. Taha Bahadori, R. Khemani, and Y. Liu. **Time Series Feature Learning with Applications to Health Care**. In *Mobile Health: Sensors, Analytic Methods, and Applications*, edited by James M. Rehg, Susan A. Murphy, and Santosh Kumar. 2017.

B2. W. Gryc, M. Helander, R. Lawrence, Y. Liu, C. Perlich, C. Reddy, S. Rosset. **Looking for Great Ideas: Analyzing the Innovation Jam.** *Advances in Web Mining and Social Network Analysis*, Springer, 2008.

Conference Publication

C1. N. Kamra, U. Gupta, F. Fang, Y. Liu and M. Tambe. **Policy Learning for Continuous Space Security Games using Neural Networks**. To appear in *AAAI*, 2018.

C2. D. Cheng, N. Ruchansky, and Y. Liu, **Matrix completability analysis via graph k-connectivity**. To appear in *AISTATS*, 2018.

C3. R. Yu, Y. Li, and Y. Liu. **Tensor Regression Meets Gaussian Processes**. To appear in *AISTATS*, 2018.

C4. S. Seo, A. Mohegh, G. Ban-Weiss, and Y. Liu. **Automatically Inferring Data Quality for Spatiotemporal Forecasting**. To appear in *6th International Conference on Learning Representations (ICLR)*, 2018.

C5. S. Seo, H. Chan, P. J. Brantingham, J. Leap, P. Vayanos, M. Tambe and Y. Liu. **Partially Generative Neural Networks for Gang Crime Classification with Partial Information**. To appear in *AAAI/ACM Conference on AI, Ethics, and Society.* 2018.

C6. Y. Li, R. Yu, C. Shahabi, Y. Liu. **Diffusion Convolutional Recurrent Neural Network: Data-Driven Traffic Forecasting**. To appear in *6th International Conference on Learning Representations (ICLR).* 2018.

C7. M. Tsang, D. Cheng, Y. Liu. **Detecting Statistical Interactions from Neural Network Weights**. To appear in *6th International Conference on Learning Representations (ICLR).* 2018.

C8. R. Yu, Y. Li, U. Demiryurek, C. Shahabi, Y. Liu. **Deep Learning: A Generic Approach for Extreme Condition Traffic Forecasting**. *SIAM International Conference on Data Mining (SDM)*, 2017

C9. X. He and Y. Liu, **Not Enough Data? Joint Inferring Multiple Diffusion Networks via Network Generation Priors**. *ACM International Conference on Web Search and Data Mining (WSDM)*, 2017.

C10. Z. Che, Y. Cheng, S. Zhai, Z. Sun, and Y. Liu. **Boosting Deep Learning Risk Prediction with Generative Adversarial Networks for Electronic Health Records**. *Proceedings of the IEEE 17th International Conference on Data Mining (ICDM)*, 2017.

C11. S., N.Ruchansky, and Y. Liu. **CSI: A Hybrid Deep Model for Fake News Detection**. *Proceedings of the 26th ACM International on Conference on Information and Knowledge Management (CIKM)*, 2017.

C12. S. Seo, J. Huang, H. Yang, and Y. Liu. **Interpretable Convolutional Neural Networks with Dual Local and Global Attention for Review Rating Prediction**. *Proceedings of the 11th ACM Conference on Recommender Systems (RecSys).* ACM, 2017.

C13. Z. Che, J. St. Sauver, H. Liu, and Y. Liu. **Deep Learning Solutions for Classifying Patients on Opioid Use**. *Proceedings of the American Medical Informatics Association Annual Symposium (AMIA)*, 2017.

C14. S. Purushotham, W. Carvalho, T. Nilanon and Y. Liu. **Variational Recurrent Adversarial Deep Domain Adaptation**. *International Conference on Learning Representations (ICLR)*, 2017.

C15. S. Seo, N.Ruchansky, and Y. Liu. **CSI: A Hybrid Deep Model for Fake News**. *Proceedings of the 26th ACM International on Conference on Information and Knowledge Management (CIKM)*, 2017.

C16. S. Seo, J. Huang, H. Yang, and Y. Liu. **Interpretable Convolutional Neural Networks with Dual Local and Global Attention for Review Rating Prediction**. *Proceedings of the 11th ACM Conference on Recommender Systems (RecSys)*, 2017.

C17. R. Yu, Y. Li, U. Demiryurek, C. Shahabi, Y. Liu. **Deep Learning: A Generic Approach for Extreme Condition Traffic Forecasting**. *SIAM International Conference on Data Mining (SDM)*, 2017

C18. X. He and Y. Liu, **Not Enough Data? Joint Inferring Multiple Diffusion Networks via Network Generation Priors**, *ACM International Conference on Web Search and Data Mining (WSDM)*, 2017.

C19. Xinran He, Ke Xu, David Kempe and Yan Liu. **Learning Influence Functions from Incomplete Observations**. *Advances in Neural Information Processing Systems (NIPS)*, 2016.

C20. Dehua Cheng, Richard Peng, Ioakeim Perros, and Yan Liu. **SPALS: Fast Alternating Least Squares via Implicit Leverage Scores Sampling**. *Advances in Neural Information Processing Systems (NIPS)*, 2016.

C21. Z. Che, S. Purushotham, R. Khemani, and Y. Liu. **Interpretable Deep Models for ICU Outcome Prediction**. *American Medical Informatics Assocation Annual Symposium (AMIA)*, 2016.

C22. D. Deng, C. Shahabi, U. Demiryurek, L. Zhu, R. Yu and Yan Liu. **Latent Space Model for Road Networks to Predict Time-Varying Traffic**. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD'16)*, 2016.

C23. R. Yu and Y. Liu. **Learning from Multiway Data: Simple and Efficient Tensor Regression**. *International conference on Machine Learning (ICML'16)*, 2016.

C24. R. Yu, A. Gelfand, S. Rajan, C. Shahabi, Y. Liu. **Geographic Segmentation via Latent Poisson Factor Model**. To appear in *ACM International Conference on Web Search and Data Mining (WSDM)*, 2016. [Acceptance Rate: 18.0%]

C25. M.T. Bahadori, D. Kale, Y. Fan, Y. Liu. **Functional Subspace Clustering with Application to Time Series**. *International Conference on Machine Learning (ICML 2015)*, 2015. [Acceptance Rate: 26.0%]

C26. X. He, T. Rekatsinas, J. Foulds, L. Getoor, Y. Liu. **HawkesTopic: A Joint Model for Network Inference and Topic Modeling from Text-Based Cascades**. *International Conference on Machine Learning (ICML 2015)*, 2015. [Acceptance Rate: 26.0%]

C27. R. Yu, D. Cheng, Y. Liu. **Accelerated Online Low Rank Tensor Learning for Multivariate Spatiotemporal Streams**. *International Conference on Machine Learning (ICML 2015)*, 2015. [Acceptance Rate: 26.0%]

C28. Z. Che, D. Kale, W. Li, M. T. Bahadori, and Y. Liu. **Deep Computational Phenotyping**. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD'15)*, 2015. [Acceptance Rate: 19.4%]

C29. D. Cheng, Y. Cheng, Y. Liu, R. Peng, and S. Teng. **Efficient Sampling for Gaussian Graphical Models via Spectral Sparsification**. *International Conference on Learning Theory (COLT '15)*, 2015. [Acceptance Rate: 39.4%]

C30. D. Cheng, X. He, Y. Liu. **Model Selection for Topic Models via Spectral Decomposition**. *Proceedings of AISTAT'2015,* 2015. [Acceptance Rate: 26.7%]

C31. D. Kale, M. Ghazvininejad, A. Ramakrishna, J. He, Y. Liu. **Hierarchical Active Transfer Learning**. *Proceedings of SIAM Conference on Data Mining (SDM)*, 2015. [Acceptance Rate: ≈10% (Full Presentation)]

C32. M. T. Bahadori, R. Yu, Y. Liu, **Fast Multivariate Spatio-temporal Analysis via Low Rank Tensor Learning**. *Spotlight in NIPS (NIPS 2014)*, 2014. [Acceptance Rate: 24.7% (Full paper) and 4.9% (Spotlight)]

C33. Y. Chang, M. Yamada, A. Ortega, Y. Liu. **Ups and Downs in Buzzes: Life Cycle Modeling for Temporal Pattern Discovery**. *Proceedings of the IEEE 14th International Conference on Data Mining (ICDM)*, 2014. [Acceptance Rate: 19.65%]

C34. D. Kale, D. Gong, Z. Che, G. Medioni, R. Wetzel, P. Ross, Y. Liu. **An Examination of Multivariate Time Series Hashing with Applications to Health Care**. *Proceedings of the IEEE 14th International Conference on Data Mining (ICDM)*, 2014. [Acceptance Rate: 9.77% (Full Presentation)]

C35. D. Cheng, Y. Liu. **Parallel Gibbs Sampling for Hierarchical Dirichlet Processes via Gamma Processes Equivalence**. *ACM Conference on Knowledge Discovery & Data Mining (SIGKDD)*, 2014. [Acceptance Rate: 14.6%]

C36. D. Cheng, M. Bahadori, Y. Liu. **FBLG: A Simple and Effective Approach for Temporal Dependence Discovery from Time Series Data**. *ACM Conference on Knowledge Discovery & Data Mining (SIGKDD)*, 2014. [Acceptance Rate: 14.6%]

C37. R. Yu, X. He, Y. Liu. **GLAD: Group Anomaly Detection in Social Media Analysis.** *ACM Conference on Knowledge Discovery & Data Mining (SIGKDD)*, 2014. [Acceptance Rate: 14.6%]

C38. J. He, Y. Liu, Q. Yang. **Linking Heterogeneous Input Spaces with Pivots for Multi-Task Learning**. *SIAM Conference on Data Mining (SDM'14)*, 2014. [Acceptance Rate: 15%]

C39. T. Bahadori, Y. Liu, E. P. Xing. **Fast Structure Learning in Generalized Stochastic Processes with Latent Factors**. *ACM Conf. on Knowledge Discovery & Data Mining (SIGKDD)*, 2013. [Acceptance Rate: 17.4%]

C40. M. T. Bahadori, Y. Liu, **An Examination of Large-Scale Granger Causality Inference**. *SIAM Conference on Data Mining (SDM'13)*, 2013. [Acceptance Rate: 25.5%]

C41. V. Pham, C. Shahabi, Y. Liu. **An Entropy-Based Model to Infer Social Strength from Spatiotemporal Data**. *ACM SIGMOD Conference on Management of Data (SIGMOD'13)*, 2013. [Acceptance Rate: 20%]

C42. Y. Chang, X. Wang, Q. Mei, Y. Liu. **Towards Twitter Context Summarization with User Influence Models**. *International Conference on Web Search and Data Mining (WSDM' 2013)*, 2013. [Acceptance Rate: 19%]

C43. H. Qiu, Y. Liu, N. Subrahmanya, W. Li. **Granger Graphical Models for Time-Series Anomaly Detection**. *International conference on Data Mining (ICDM' 2012)*, 2012. [Acceptance Rate: 19%]

C44. Y. Liu, T. Bahadori, H. Li. **Sparse-GEV: Sparse Latent Space Model for Multivariate Extreme Value Time Serie Modeling**. *International conference on Machine Learning (ICML'2012)*, 2012. [Acceptance Rate: 27.3%]

C45. S. Purushotham, Y. Liu, C-C. Kuo. **Collaborative Topic Regression with Social Matrix Factorization for Recommendation Systems**. *International conference on Machine Learning (ICML'2012)*, 2012. [Acceptance Rate: 27.3%]

C46. W. Zhou, H. Jin, Y. Liu. **Community Discovery and Profiling with Social Messages**. *ACM Conf. on Knowledge Discovery & Data Mining (SIGKDD)*, 2012. [Acceptance Rate: 25% (Industry and Government Track)]

C47. M. T. Bahadori, Y. Liu, **Causality Analysis in Irregular Time Series**. *SIAM Conference on Data Mining (SDM'12)*, 2012. [Acceptance Rate: 27%]

C48. J.-H. Kang, J. Ma, Y. Liu. **Transfer Topic Modeling with Ease and Scalability**. *SIAM Conference on Data Mining (SDM'12)*, 2012. [Acceptance Rate: 27%]

C49. D. Zhang, Y. Liu, S. Luo, J. Zhang and R. Lawrence. **Multiple Instance Learning on Structured Data**. *Proceedings of Twenty-Fifth Annual Conference on Neural Information Processing Systems (NIPS '11)*, 2011. [Acceptance Rate: 22%]

C50. M. T. Bahadori, Y. Liu, D. Zhang. **Learning with Minimum Supervision: A General Framework for Transductive Transfer Learning**. *Proceedings of IEEE International Conference on Data Mining (ICDM' 11)*, 2011. [Acceptance Rate: 18%]

C51. M. Hauder, Y. Gil, Y. Liu. **A Framework for Efficient Text Analytics through Automatic Configuration and Customization of Scientific Workflows**. *Proceedings of e-Science*, 2011. [Acceptance Rate: 49.1%]

C52. Y. Liu, P. Hseuh, R. Lawrence, S. Meliksetian, C. Perlich, A. Veen. **Latent Graphical Models for Quantifying and Predicting Patent Quality**. *Proceedings of the 17th ACM Conf. on Knowledge Discovery & Data Mining (SIGKDD)*, 2011. [Acceptance Rate: 17.5 %]

C53. D. Zhang, Y. Liu, Luo Si. **Serendipitous Learning: Learning Beyond the Predefined Label Space**. *Proceedings of the 17th ACM Conf. on Knowledge Discovery & Data Mining (SIGKDD)*, 2011. [Acceptance Rate: 17.5%]

C54. D. Zhang, J. He, Y. Liu, L. Si, R. D. Lawrence. **Multi-View Transfer Learning with a Large Margin Approach**. *Proceedings of the 17th ACM Conf. on Knowledge Discovery & Data Mining (SIGKDD)*, 2011. [Acceptance Rate: 17.5%]

C55. Y. Chang, R. Zhang, S. Reddy, Y. Liu. **Detecting Multilingual and Multi-Regional Query Intent in Web Search**. *Proceedings of the 25th AAAI Conference on Artificial Intelligence (AAAI)*, 2011. [Acceptance Rate: 24.8%]

C56. D. Zhang, Y. Liu, R. D. Lawrence, V. Chenthamarakshan. **Transfer Latent Semantic Learning: Microblog Mining with Less Supervision**. *Twenty-Fifth AAAI Conference on Artificial Intelligence (AAAI)*, 2011. [Acceptance Rate: 24.8%]

C57. Y. Liu, A. Niculescu-Mizil, A. Lozano, Y. Lu. **Learning Temporal Graphs for Relational Time-Series Analysis**. *International conference on Machine Learning (ICML' 10)*, 2010. [Acceptance Rate: 25.9%]

C58. X. Chen, Y. Liu, H. Liu, J.G. Carbonell. **Learning Spatial-Temporal Varying Graphs with Applications to Climate Data Analysis**. *Proceedings of the Twenty-Fourth Conference on Artificial Intelligence (AAAI)*, 2010. [Acceptance Rate: 26.9%]

C59. Y. Liu, A. Niculescu-Mizil, A. Lozano, Y. Lu. **Temporal Graphical Models for Cross-Species Gene Regulatory Network Discovery**. *International conference on Computational Systems Bioinformatics (CSB' 10)*, 2010. [Acceptance Rate: 25%]

C60. Q. Wang, H. Jin. Y. Liu, **Collaboration Analytics: Mining Work Patterns from Collaboration Activities**. *To appear in International Conference on Information and Knowledge Management (CIKM' 10)*, 2010. [Acceptance Rate: 30.8%]

C61. Y. Liu, A. Niculescu-Mizil, W. Gryc. **Topic-Link LDA: Joint Models of Topic and Author Community**. *International conference on Machine Learning (ICML' 09)*, 2009. [Acceptance Rate: 26.9%]

C62. Y. Liu, J.R. Kalagnanam, O. Johnsen. **Learning Dynamic Temporal Graphs for Oil-production Equipment Monitoring System**. *International Conference on Knowledge Discovery and Data Mining (KDD' 09)*, 2009. [Acceptance Rate: 9.8% (Industry Track)]

C63. J. He, Y. Liu, R. Lawerence. **Graph-based Transfer Learning**. *Proc. of ACM Conference on Information and Knowledge Management (CIKM'09)*, 2009. [Acceptance Rate: 14.5% (Regular Presentation)]

C64. A. Lozano, H. Li, A. Niculescu-Mizil, Y. Liu, C. Perlich, J. Hosking, N. Abe. **Spatial-temporal causal modeling for climate change attribution**. *International Conference on Knowledge Discovery and Data Mining (KDD' 09)*, 2009. [Acceptance Rate: 10.2% (Regular Presentation)]

C65. A.C. Lozano, N. Abe, Y. Liu, S. Rosset. **Grouped Graphical Granger Modeling Methods for Temporal Causal Modeling**. *International Conference on Knowledge Discovery and Data Mining (KDD' 09)*, 2009. [Acceptance Rate: 10.2% (Regular Presentation)]

C66. A.C. Lozano, N. Abe, Y. Liu, S. Rosset. **Grouped Graphical Granger Modeling for Gene Expression Regulatory Networks Discovery**. *International Conference on Intelligent Systems for Molecular Biology (ISMB' 09)*, 2009. [Acceptance Rate: 19%]

C67. Y. Liu, P. Hsueh, J. Lai, M. Sangin, M.A. Nussli, P. Dillenbourg. **Who is the Expert? Analyzing Gaze Data to Predict Expertise Level in Collaborative Applications.** *International Conference on Multimedia & Expo (ICME'09)*, 2009. [Acceptance Rate: 19% (oral Presentation)]

C68. T. Ide, A. Lozano, N. Abe, Y. Liu. **Proximity-Based Anomaly Detection using Sparse Structure Learning.** *SIAM Conference on Data Mining (SDM'09)*, 2009.

C69. J. He, Y. Liu, R. Lawrence. **Graph-based Rare Category Detection**.*International Conference on Data Mining (ICDM'08)*, 2008. [Acceptance Rate: 19.9%]

C70. A. Arnold, Y. Liu, N. Abe. **Temporal Causal Modeling with Graphical Granger Methods**.*ACM Conference on Knowledge Discovery and Data Mining (KDD'07)*, 2007. [Acceptance Rate: 17.9%]

C71. Y. Liu, J. Carbonell, V. Gopalakrishnan, P. Weigele. **Protein Quaternary Fold Recognition Using Conditional Graphical Models**. *International Joint Conference in Artificial Intelligence (IJCAI'07)*, 2007. [Acceptance Rate: 15.7% (Oral Presentation)]

C72. J. He, J. Carbonell, Y. Liu. **Graph-Based Semi-Supervised Learning as a Generative Model**. *International Joint Conference in Artificial Intelligence (IJCAI'07)*, 2007. [Acceptance Rate: 15.7% (Oral Presentation)]

C73. K. Probst, R. Ghani, M. Krema, A. Fano, Y. Liu. **Semi-supervised Learning of Attribute-Value Pairs from Product Descriptions**. *International Joint Conference in Artificial Intelligence (IJCAI'07)*, 2007. [Acceptance Rate: 34.7%]

C74. J. Yang, Y. Liu, E. P. Xing, A. Hauptmann. **Harmonium Models for Semantic Video Representation and Classification**. *SIAM Conference on Data Mining (SDM'07)*, 2007. [Acceptance Rate: 12%]

C75. Y. Liu, J. Yang, A. Hauptmann.**Undirected Graphical Models for Video Analysis and Classification.** *International Conference on Multimedia & Expo (ICME'07)*, 2007.

C76. Y. Liu, E. Xing, J. Carbonell. **Predicting Protein Folds with Structural Repeats Using a Chain Graph Model**. *International conference on Machine Learning (ICML'05)*, 2005. [Acceptance Rate: 27.3%]

C77. Y. Liu, J. Carbonell, P. Weigele, V. Gopalakrishnan. **Segmentation Conditional Random Fields (SCRFs): A New Approach for Protein Fold Recognition**. *ACM Conference on Research in Computational Molecular Biology (RECOMB'05)*, 2005. [Acceptance Rate: 18%]

C78. Y. Liu, J. Carbonell, J. K. Seetharaman, V. Gopalakrishnan. **Context Sensitive Vocabulary and Its Application in Protein Secondary Structure Prediction**. *ACM International Conference on Research and Development in Information Retrieval (SIGIR'04)*, 2004. [Acceptance Rate: 50% (Poster Presentation)]

C79. J. Lafferty, X. Zhu, Y. Liu. **Kernel Conditional Random Fields: Representation and Clique Selection**. *International Conference on Machine Learning (ICML'04)*, 2004. [Acceptance Rate: 32%]

C80. Y. Liu, J. Carbonell, J. K. Seetharaman, V. Gopalakrishnan. **Prediction of Parallel and Antiparallel Beta-sheets using Conditional Random Fields**. *Biological Language Conference (BLC'03)*, 2003.

C81. Y. Liu, J. Carbonell, R. Jin. **A New Pairwise Ensemble Approach for Text Classification**. *Proc. of 14th European Conference on Machine Learning (ECML'03)*, 2003. [Acceptance Rate: 24.1%]

C82. R. Jin, Y. Liu, S. Luo, J. Carbonell, A. Hauptmann. **A New Boosting Algorithm Using Input-Dependent Regularizer**. *Proc. of 20th International Conference on Machine Learning (ICML'03)*, 2003. [Acceptance Rate: 32.1%]

C83. R. Yan, Y. Liu, R. Jin, A. Hauptmann. **On Predicting Rare Class with SVM Ensemble in Scene Classification**. *Proc. of IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP'03)*, 2003.

C84. Y. Liu, Y. Yang, J. Carbonell. **Boosting to Correct the Inductive Bias for Text Classification**. *Proc. of ACM Conference on Information and Knowledge Management (CIKM'02)*, 2002. [Acceptance Rate: 25%]

Workshop Publication

W1. S. Purushotham, Z. Che, B. Jiang and Yan Liu. **Deep Multi-Instance Learning for Concept Annotation from Medical Time Series Data**. *NIPS Machine Learning for Health Workshop*, Long Beach, USA, 2017.

W2. Z. Che, X. He, K. Xu, and Y. Liu. **DECADE: A Deep Metric Learning Model for Multivariate Time Series**. *KDD Workshop on Mining and Learning from Time Series (MiLeTS)*, 2017.

W3. S. Seo, A. Mohegh, G. Ban-Weiss, and Y. Liu. **Data Quality Network for Spatiotemporal Forecasting**. *NIPS Deep Learning for Physical Sciences Workshop*. 2017.

W4. S. Seo, A. Mohegh, G. Ban-Weiss, and Y. Liu. **Graph Convolutional Autoencoder with Recurrent Neural Networks for Spatiotemporal Forecasting**. *Proceedings of the Seventh International Workshop on Climate Informatics*. 2017.

W5. S. Seo, J. Huang, H. Yang, and Y. Liu. **Representation Learning of Users and Items for Review Rating Prediction Using Attention-based Convolutional Neural Network**. *3rd International Workshop on Machine Learning Methods for Recommender Systems (MLRec)(SDM17)*. 2017.

W6. N. Kamra, P. Goyal, X. He and Y. Liu. **DynGEM: Deep Embedding Method for Dynamic Graphs**. *IJCAI International Workshop on Representation Learning for Graphs (ReLiG)*, 2017.

W7. S. Purushotham, W. Carvalho and Y. Liu. **Variational Adversarial Deep Domain Adaptation for Healthcare Time Series Analysis**. *NIPS Machine Learning for Healthcare Workshop (NIPS 2016)*, 2016.

W8. T. Nilanon, S. Purushotham and Y. Liu. **Normal / Abnormal Heart Sound Recordings Classification Using Deep Recurrent Neural Network**. *Proceedings of the Computing in Cardiology (CinC 2016)*. 2016

W9. Z. Che, S. Purushotham and Y. Liu. **Distilling Knowledge from Deep Networks with Applications to Computational Phenotyping**. *Data Science Learning and Applications to Biomedical and Health Sciences Workshop*, New York Academy of Sciences, 2016.

W10. R. Yu, S. Purushotham, Y. Liu. **Efficient Spatio-Temporal Sampling via Tensor Sketching**. *Advances in Neural Information Processing Systems (NIPS) time series workshop*, 2015.

W11. Z. Che, S. Purushotham, Y. Liu. **Distilling Knowledge from Deep Networks with Applications to Healthcare Domain**. *NIPS Workshop on Machine Learning for Healthcare (MLHC)*, 2015.

W12. R. Yu, D. Cheng, Y. Liu. **Accelerated Online Low-Rank Tensor Learning for Multi-model Ensemble**. *International Workshop on Climate Informatics (CI) workshop*, 2015.

W13. M. T. Bahadori, Y. Chang, B. Long, Y. Liu, **Scalable Heterogeneous Transfer Ranking**. *Journal of Machine Learning Research*, W&CP 36: 214–228, 2014.

W14. D. Zhang, Y. Liu. L. Si. **Which Tweets Will Be Headlines? A Hierarchical Bayesian Model for Bridging Social Media and Traditional Media**. *The 8th KDD Workshop on Social Network Mining and Analysis for Business, Consumer and Social Insights (SNA-KDD)*, 2014.

W15. M. T. Bahadori, R. Yu, Y. Liu. **Fast Cokriging via Low Rank Tensor Learning**. *International Workshop on Climate Informatics (CI) workshop*, 2014

W16. D. Kale, S. Di, Y. Liu, Y. Gil. **Capturing Data Analytics Expertise with Visualization in Workflows**. *AAAI Fall Symposium Series: Discovery Informatics: AI Takes a Science-Centered View on Big Data,* 2013.

W17. M. T. Bahadori, Y. Liu. **On Causality Inference in Time Series**. In *AAAI Fall Symposium on Discovery Informatics Symposium,* 2012.

W18. M. T. Bahadori, Y. Liu. **Granger Causality Analysis with Hidden Variables in Climate Science Applications**. In *Second International Workshop on Climate Informatics*, 2012.

W19. M. Hauder, Y. Gil, R. Sethi, Y. Liu, and H. Jo. **Making Data Analysis Expertise Broadly Accessible through Workflows**. In *Proceedings of the Sixth Workshop on Workflows in Support of Large-Scale Science (WORKS'11)*, 2011.

W20. Q. Yuan, S. Zhao, L. Chen, Y. Liu, S. Ding, X. Zhang, W. Zheng. **Augmenting Collaborative Recommender by Fusing Explicit Social Relationships**. *ACM RecSys'09 Workshop on Recommender Systems & the Social Web*, 2009.

W21. A. Niculescu-Mizil, C. Perlich, G. Swirszcz, V. Sindhwani, Y. Liu, P. Melville, D. Wang, J. Xiao, J. Hu, M. Singh, W. Shang , Y. Zhu. **Winning the KDD Cup Orange Challenge with Ensemble Selection**. *Journal of Machine Learning Research W & CP*. **7**:23-34, 2009.

W22. Y. Liu, Z. Kou, C. Perlich, R. Lawrence. **Intelligent System for Workforce Classification**. *SIG-KDD Workshop on Data Mining for Business Applications*, 2008.

W23. Y. Liu, J. Carbonell, V. Gopalakrishnan, P. Weigele. **Discriminative Graphical Models for Protein Quaternary Structure Motif Detection.** *ICML workshop on Constrained Optimization and Learning with Structured Outputs,* 2007.

W24. M. Helander, R. Lawrence, Y. Liu, C. Perlich, C. Reddy, S. Rosset. **Looking for Great Ideas: Analyzing the Innovation Jam**. *SIGKDD workshop on Web Mining and Social Network Analysis*, 2007.

W25. P. Melville, Y. Liu, R. Lawrence, I. Khabibrakhanov, C. Pendus, T. Bowden. **Finding New Customers Using Unstructured and Structured Data**. *SIGKDD workshop on Mining Multiple Information Sources*, 2007.

W26. K. Probst, R. Ghani, M. Krema, A. Fano, Y. Liu. **Semi-Supervised Learning to Extract Attribute-Value Pairs from Product Descriptions on the Web**. *ECML workshop on Web Mining*, 2006.

Technical Reports

T1. P. Melville, Y. Liu, W. Gryc, R. Lawrence, C. Perlich. **Learning Blog Sentiment with Reduced Supervision**. *IBM Technical Report*, 2008.

T2. J. Lafferty, Y. Liu, X. Zhu. **Kernel Conditional Random Fields: Representation, Clique Selection, and Semi-Supervised Learning**. *CMU technical report CMU-CS-04-115*, 2004.

Patents

P1. Invention No. 2017-057, Deep Learning Framework for Mining and Predictive Modeling of Healthcare Data

P2. USC 2017-0184. Prognosis for metastatic cancer patients using single cell liquid biopsy and deep learning

P3. USC 2017-243. Effective Knowledge Transfer Among Patient Populations via Deep Learning

P4. USC 2017-023. Latent Space Model for Road Networks to Predict Time-Varying Traffic

P5. J. He, R. Lawrence, Y. Liu. A System and Method for Graph-based Transfer Learning. US patent files ad Docket YOR9-2009-0424-US2.

P6. N. Duan, P.S. Hsueh, Y. Liu. Systems and Methods for Identifying Content-Sensitive Authorities from Very Large Scale Networks. US patent files ad Docket YOR9-2009-0630-US1.

P7. W. Gryc, R. Lawrence, Y. Liu. System and Method for Extracting Patterns from Graph and Unstructured Data. US patent files ad Docket YOR8-2008-0976-US1.

P8. B. Dietrich J. Lai, Y. Liu. Method and System for Controlling Skill Acquisition. US patent filed as Docket YOR9-2008-0048-US1.

P9. S. Carty, Y. Liu, T. Kumar, G. Parijia. A Goal Programming Approach for Optimal Budget Allocation for National Analysis of Wildland Fire Management. US patent filed as Docket YOR9-2007-0755-US1.

P10. U. Chitnis, T. Bowden, Khabibrakhmanov, R. Lawrence, Y. Liu, P. Melville. A Method and System for Identifying Companies with Specific Business Objectives. US patent filed as Docket YOR9-2007-0060-US1.

P11. A. Fano, R. Ghani, M. Krema, Y. Liu, K. Probst. Extraction of Attributes and Values from Natural Language Documents. US patent filed as Docket No. 33836.00.0145.

Teaching

STUDENT ADVISORY

PhD Student Supervised

Taha Bahadori	01/2011 ∼ 05/2015	First position: Postdoc at Georgia Tech.
Xinran He	08/2012 ∼ 05/2017	Co-advised with David Kempe First position: Snap Research
Rose Yu	08/2012 ∼ 05/2017	Co-advised with Cyrus Shahabi First position: Northeastern University
Dehua Cheng	08/2012 ∼ 12/2017	First position: Facebook
Zhenping Che	08/2013 ∼ present	Qual exam: 04/2016
Sungyong Seo	08/2015 ∼ present	Qual exam: 01/2017
Nitin Karma	02/2016 ∼ present	Screening exam: 04/2016
Umang Guphta	07/2017 ∼ present	
Hanpeng Liu	07/2017 ∼ present	

MS Students Supervised (Directed Research)

Spring 2015:	Rezaul Akram Barbhuiya, Zeyu Dai, Rohit Kondekar, Tanachat Nilanon Kanit Srisuthep, Mahesh Goud Tandarpally, Xukai Tang
Fall 2014:	Shaofeng Mo
Summer 2014:	Yun Ling
Fall 2013:	Anil Ramakrishna, Cai Shu, Paul Miyazaki
Spring 2013:	Ketan Singh
Fall 2012:	Jaspreet Singh
Summer 2012:	Jaspreet Singh
Spring 2012:	Yan Wang, Yupeng Ji, Caoqianli Gao
Fall 2011:	Yan Wang, Gaurav Dalvi, Caoqianli Gao, Mohanish Penta, Anurag Zulkanthiwar
Spring 2011:	Shiv Prakash

Undergraduate Supervised

David Bell, Bonnie Jia (USC)
Timi Okuboyejo, Timothy James Darcy, Jorge Quero, Kristen McNeal (Pre-college underrepresented students)
Biswajit Paria, Ashwini Pokle, Roney Micha (Viterbi-India Summer Research program)
Xiwei Feng, Sibo Jia, Yifan Li (USC-THU Summer Research Program)
Johnny Galsurkar, Francis Teng and Samuel Di (REU Program)

High-school Student Supervised

Allen Chen (Cupertino High School)

Ph.D. Qual Committee (37 students in total)
Hashem Alayed, Prithviraj Banerjee, Charalampos Chelmis, Na Chen, Yoon-sik Cho, Chao Dai, Jnaneshwar Das, Reza Dehestani, Tobias Flach, Xiang Fu, Rumi Ghosh, Boqing Gong, Xiaolin Hao, Yukikazu Hidaka, Ling Hu, Haomiao Jin, Mrinal Kalakrishnan, Dileep Kalathil, Jeon-Hyung Kang, Leyla Kazemi, Ali Khodaei, Sunil Kumar, Qingjiao Li, Na Li, Yintao Liu, Penny Pan, Navid Naderializadeh, Sanjay Purushotham, Lingyan Sheng, Chen Sun, Po-He Tseng, Jingwei Wang, Wenjun Wang, Bo Wu, XueMei Zhao, Jianyang Zhang, Jing Zhang.

Ph.D. Thesis Committee (11 students in total)
Hashem Alayed, SeongHo Cho, Chao Dai, Haomiao Jin, Rumi Ghosh, Dian Gong, Dileep Kalathil,

Hanie Sedghi, Songhua Xing, XueMei Zhao, Mi Zhang.

Summer Interns Supervised (while at IBM)
Dan Zhang (Purdue University), 2010
Jingrui He (now at IBM Research), 2008
Zhenzhen Kou (now at Yahoo!), 2007

COURSES TAUGHT

Semester	Class Name	Size
Fall 2010	CSCI-599 Advanced Data Analytics	12
Fall 2011	CSCI-599 Advanced Data Analytics	21
Spring 2011	CSCI-599 Data Mining and Statistical Inference	30
Fall 2012	CSCI-599 Advanced Big Data Analytics	17
Spring 2013	CSCI-599 Data Mining and Statistical Inference	33
Spring 2014	CSCI-686 Advanced Big Data Analytics	27
Fall 2014	CSCI-567 Machine Learning	34
Fall 2015	CSCI-567 Machine Learning	121
Fall 2015	CSCI-686 Advanced Big Data Analytics	22
Fall 2016	CSCI-567 Machine Learning (Session 1)	146
Fall 2016	CSCI-567 Machine Learning (Session 2)	35

GUEST LECTURES

CSCI-579 CSCI Seminar, 2011-2015
CSCI-561 Foundations of AI, 2013
CSCI-200 Object-Oriented Programming, 2011

TEACHING ASSISTANT

Language and Statistics, Carnegie Mellon University, Spring 2004
Web-Based Information Architectures, Carnegie Mellon University, Fall 2003
Data mining and Web Architectures, Carnegie Mellon University West Campus, Fall 2002 & Summer 2003

Service

Professional Services

Workshop Co-organizer
ICML Workshop on Time Series, 2017
KDD Workshop on Time Series Learning and Mining, 2017
KDD Workshop on Time Series Learning and Mining, 2016
KDD Workshop on Time Series Learning and Mining, 2015
4th International Workshop on Climate Informatics, 2015
AAAI Discovery Informatics Symposium, 2013
ICML Workshop on Machine Learning with Workflows, 2013
KDD Workshop on Large-scale Data Mining: Theory and Applications (LDMTA), 2010-2012
ICDM Workshop on Large-scale Analytics for Complex Instrumented Systems (LACIS), 2010
ICDM Workshop on Large-scale Data Mining: Theory and Applications (LDMTA), 2009
IBM Workshop on Statistical Learning and its Application (SMILE), 2009

Conference Organizing Committee
Program co-Chair of WSDM 2018
Publicity co-Chair of SDM 2013
Poster co-Chair of KDD 2012
Local Chair of SDM 2012
Publicity co-Chair of KDD 2011

Tutorials
Deep Learning for Health Care: Challenges and Solutions. ICML 2017, AAAI 2018.
Challenges and Solutions: Social Media Anomaly Detection. KDD 2015.
Causality Analysis in Large-scale Time Series Data. CIKM 2013.

Grant Reviewer/Panelist
NSF Review Panel, 2009, 2014, 2015, 2016, 2017
Reviewer for National Security Agency (NSA) Mathematical Sciences Grant Program, 2011
Reviewer for Netherlands Organization for Scientific Research (NWO), 2007

NSF Workshop Participant
NSF Workshop on GEO-IIS, 2015
NSF Workshop on Discovery Informatics, 2012

Program Co-chair
Third International Workshop on Climate Informatics, 2013
High Performance Computing Conference (HiPC) Workshop on Massive Data Analytics on Scalable Systems, 2012

Senior Program Committee (or Area Chair)
SDM 2016, CIKM 2015, WSDM 2015, ICML 2014, WSDM 2013

Program Committee (or equivalent)
KDD (2008, 2010, 2012-2015); NIPS (2009, 2010, 2014-2015); ICML (2009, 2011, 2014-2015); SDM (2010-2014); AAAI (2010-2013, 2015); IJCAI (2013, 2015); UAI (2015); ECML (2011, 2014, 2015); CIKM (2008-2011, 2013-2014); ICDM (2009-2014); EMNLP (2010-2011); WWW (2011); COLING (2010); SIGIR (2009); PAKDD (2012); NAACL (2012); ACL (2012); WSDM (2012, 2013-2014); IEEE BigData (2013-2015)
ICDM Workshop on Mining Graphs and Complex Structures, 2007; NIPS workshop on Structured Input and Structured Output, 2008; NIPS workshop on cost-sensitive learning, 2008; ICDM International Workshop on Knowledge Discovery Using Cloud and Distributed Computing Platforms, 2011; KDD SNA Workshop, 2012; KDD Workshop on Cross Domain Knowledge Discovery in Web and Social Network Mining, 2012; AMIA Summit on Translational Bioinformatics, 2012

Guest Editor
TKDD Special Issue on Large-Scale Data Mining

Reviewer
Journal of Machine Learning Research (JMLR), Transactions on Knowledge Discovery and Data Mining (TKDD), Transactions on Knowledge and Data Engineering (TKDE), Journal of Artificial Intelligence Research (JAIR), Artificial Intelligence, Annals of Applied Statistics, Statistical Analysis and Data Mining, Information Retrieval, Journal of Intelligent Information Systems (JIIS), ACM Transactions on Information Systems, Information Processing & Management (IP&M), Bioinformatics., Journal of Computational Biology (JCB), FEBS letters, Concurrency and Computation: Practice and Experience, Advances in Data Analysis and Classification (ADAC)