Minh Tang

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Education

2010 **Ph.D in Computer Science**,
Indiana University Bloomington.

2004 **M.S. in Computer Science**,
University of Wisconsin Milwaukee.

2001 **B.S. in Computer Science**,
Assumption University, Thailand.

Work Experience

07/19 – now **Assistant Professor**,
Department of Statistics, North Carolina State University.

01/17 – 06/19 **Associate Research Professor**,
Department of Applied Mathematics and Statistics, Johns Hopkins University.

07/14 – 12/16 **Assistant Research Professor**,
Department of Applied Mathematics and Statistics, Johns Hopkins University.

10/10 – 06/14 **Postdoctoral Fellow**,
Department of Applied Mathematics and Statistics, Johns Hopkins University.

Research Interests

statistical pattern recognition, dimensionality reduction, statistical inference on graphs

Grants and Research Award

03/17 – 08/21 co-PI on DARPA Data-Driven Discovery of Models (PI: Carey Priebe)

08/18 – 08/19 PI on Microsoft Research Award: Efficiency and Optimality in Graph Inference

Journal Publications

2019+ J. Cape and **M. Tang** and C. E. Priebe. On spectral embedding performance and elucidating network structure. *Journal of Network Science*, accepted for publication. arXiv preprint at https://arxiv.org/abs/1808.04855

2019 C. E. Priebe and Y. Park and J. T. Vogelstein and J. M. Conroy and V. Lyzinski and **M. Tang** and A. Athreya and J. Cape and E. Bridgeford. On a "two truths" phenomenon in spectral graph clustering. *PNAS*, Vol. 116, pp. 5995–6000

2019 J. Cape and **M. Tang** and C. E. Priebe. Signal-plus-noise matrix models: eigenvector deviations and fluctuations. *Biometrika*, Vol. 106, pp. 243–250

2018+ A. Athreya and **M. Tang** and Y. Park and C. E. Priebe. On estimation and inference in latent structure random graphs. *Statistical Science*, accepted for publication. arXiv preprint at http://arxiv.org/abs/1806.01401

2018+ J. Cape and **M. Tang** and C. E. Priebe. The two-to-infinity norm and singular subspace geometry with applications to high-dimensional statistics. *Annals of Statistics*, accepted for publication. arXiv preprint at http://arxiv.org/abs/1705.08917.

2018 **M. Tang** and C. E. Priebe. Limit theorems for eigenvectors of the normalized Laplacian for random graphs. *Annals of Statistics*, Vol. 46, pp. 2360–2415

2018 A. Athreya and D. E. Fishkind and K. Levin and V. Lyzinski and Y. Park and Y. Qin and D. L. Sussman and **M. Tang** and J. T. Vogelstein and C. E. Priebe, Statistical inference on random dot product graphs: a survey, *Journal of Machine Learning Research*, Vol. 18.

2017 J. Cape, **M. Tang** and C. E. Priebe. The Kato-Temple inequality and eigenvalue concentration. *Electronic Journal of Statistics*, Vol. 11, pp. 3954–3978.

2017 V. Lyzinski, **M. Tang**, A. Athreya, Y. Park and C. E. Priebe. Community detection and classification in hierarchical stochastic blockmodels. *IEEE Transactions on Network Science and Engineering*, Vol. 4, pp. 13–26.

2017 **M. Tang**, A. Athreya, D. L. Sussman, V. Lyzinski, Y. Park and C. E. Priebe. A semiparametric two-sample hypothesis testing problem for random graphs. *Journal of Computational and Graphical Statistics*, Vol. 26, pp. 344–354.

2017 **M. Tang**, A. Athreya, D. L. Sussman, V. Lyzinski, and C. E. Priebe. A nonparametric two-sample hypothesis testing problem for random dot product graphs. *Bernoulli*, Vol. 23, pp. 1599–1630.

2016 S. Suwan, D. S. Lee, R. Tang, D. L. Sussman, **M. Tang** and C. E. Priebe. Empirical Bayes estimation for the stochastic blockmodel. *Electronic Journal of Statistics*, Vol. 10, pp. 761–782.

2016 A. Athreya, V. Lyzinski, D. J. Marchette, C. E. Priebe, D. L. Sussman and **M. Tang**. A central limit theorem for scaled eigenvectors of random dot product graphs. *Sankhya Series A*, Vol. 78, pp. 1–18.

2015 C. E. Priebe, D. L. Sussman, **M. Tang** and J. T. Vogelstein. Statistical inference on errorfully observed graphs. *Journal of Computational and Graphical Statistics*, Vol. 24, pp. 930–953.

2014 V. Lyzinski, D. L. Sussman, **M. Tang**, A. Athreya and C. E. Priebe. Perfect clustering for stochastic blockmodel graphs via adjacency spectral embedding. *Electronic Journal of Statistics*, Vol 8, pp. 2905–2922.

2014 C. Shen, M. Sun, **M. Tang** and C. E. Priebe. Generalized canonical correlation analysis for classification in high dimensions. *Journal of Multivariate Analysis*, Vol. 130, pp. 310–322.

2014 D. L. Sussman, **M. Tang** and C. E. Priebe. Consistent latent position estimation and vertex classification for random dot product graphs. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 36, pp. 48–57.

2014 H. Wang, **M. Tang**, Y. Park, and C. E. Priebe. Locality statistics for anomaly detection in time-series of graphs. *IEEE Transactions on Signal Processing.*, Vol. 62, pp. 703–717.

2013 D. E. Fishkind, D. L. Sussman, **M. Tang**, J. T. Vogelstein, and C. E. Priebe. Consistent adjacency-spectral partitioning for the stochastic block model when the model parameters are unknown. *SIAM Journal on Matrix Analysis and Applications*, Vol. 34, pp. 23–39.

2013 N. H. Lee, J. Yoder, **M. Tang** and C. E. Priebe. On latent position inference from doubly stochastic messaging activities. *Multiscale Modeling and Simulation*, Vol. 11, pp. 683–718.

2013 M. Sun, C. E. Priebe and **M. Tang**. Generalized canonical correlation analysis for disparate data fusion. *Pattern Recognition Letters*, Vol. 34, pp. 194–200.

2013 **M. Tang**, Y. Park, N. H. Lee and C. E. Priebe. Attribute fusion in a latent process model for time series of graphs. *IEEE Transactions on Signal Processing*, Vol. 61, pp. 1721–1732.

2013 **M. Tang** and D. L. Sussman and C. E. Priebe. Universally consistent vertex classification for latent positions graphs. *Annals of Statistics*, Vol. 41, pp. 1406–1430.

2012 D. L. Sussman, **M. Tang**, D. E. Fishkind and C. E. Priebe. A consistent adjacency spectral embedding for stochastic blockmodel graphs. *Journal of the American Statistical Association*, Vol. 107, pp. 1119–1128.

Preprints

2018 G. Li and **M. Tang** and N. Charon and C. E. Priebe. A central limit theorem for classical multidimensional scaling. arXiv preprint at http://arxiv.org/abs/1804.00631.

2018 **M. Tang**. The eigenvalues of stochastic blockmodel graphs.arXiv preprint at http://arxiv.org/abs/1803.11551.

2018 P. Rubin-Delanchy and C. E. Priebe and **M. Tang** and J. Cape. A statistical interpretation of spectral embedding: the generalised random dot product graph. arXiv preprint at http://arxiv.org/abs/1709.05506.

2017 **M. Tang** and J. Cape and C. E. Priebe. Asymptotically efficient estimators for stochastic blockmodels: the naive MLE, the rank-constrained MLE, and the spectral. arXiv preprint at http://arxiv.org/abs/1710.10936.

2017 J. T. Vogelstein and **M. Tang** and E. Bridgeford and D. Zheng and R. Burns and M. Maggioni. Linear optimal low rank projection for high-dimensional multi-class data. arXiv preprint at http://arxiv.org/abs/1709.01233

2017 R. Tang and **M. Tang** and J. T. Vogelstein and C. E. Priebe. Robust estimation from multiple graphs under gross error contamination. arXiv preprint at http://arxiv.org/abs/1707.03487.

2017 K. Levin and A. Athreya and **M. Tang** and C. E. Priebe and V. Lyzinski. A central limit theorem for an omnibus embedding of random dot product graphs. arXiv preprint at http://arxiv.org/abs/1705.08832.

2017 P. Rubin-Delanchy and C. E. Priebe and **M. Tang**. Consistency of adjacency spectral embedding for the mixed membership stochastic blockmodel. arXiv preprint at http://arxiv.org/abs/1705.04518.

2017 C. E. Priebe and Y. Park and **M. Tang** and A. Athreya and V. Lyzinski and J. T. Vogelstein and Y. Qin and B. Cocanougher and K. Eichler and M. Zlatic and A. Cardona. arXiv preprint at http://arxiv.org/abs/1704.03297.

2016 A. Athreya, **M. Tang**, V. Lyzinski, Y.Park, B. Lewis, M. Kane, and C. E. Priebe. Numerical tolerance for spectral decompositions of random dot product graphs. arXiv preprint at http://arxiv.org/abs/1608.00451.

2013 **M. Tang**, Y. Park and C. E. Priebe. Out-of-sample extension for latent position graphs. arXiv preprint at http://arxiv.org/abs/1305.4893.

Invited Talks

02/2019 Department of Mathematics, Tulane University.

01/2019 Department of Statistics, Fox School of Business, Temple University.

12/2018 Department of Mathematics and Statistics, University of Massachusetts, Amherst.

10/2018 Department of Statistics, North Carolina State University.

09/2017 Department of Mathematics and Statistics, Boston University.

08/2017 Joint Statistical Meetings, Baltimore, MD, USA.

11/2015 Department of Statistics, Indiana University Bloomington.

02/2015 School of Industrial and Systems Engineering, Georgia Institute of Technology.

02/2015 Department of Statistics, Virginia Tech.

08/2014 Joint Statistical Meetings, Boston, MA, USA.

05/2012 Interface Symposia, Houston, TX, USA.

Teaching

JHU Generalized linear mixed models & longitudinal data analysis (Spring 2017 – Spring 2019)

JHU Professor Joel Dean Award for Excellence in Teaching (Spring 2016)

JHU Topics in statistical pattern recognition (Spring 2016)

JHU Applied statistics and data analysis (Fall 2013 – Fall 2018)

JHU Statistical learning and high-dimensional data analysis (Spring 2011)

Mentoring

JHU PhD thesis advisor of Joshua Cape (defended March 2019); co-advisor with Carey E. Priebe

JHU PhD thesis advisor of Gongkai Li (defended May 2019); co-advisor with Carey E. Priebe

JHU MS thesis advisor of Fanwen Zhu (graduated July 2018).

JHU MS thesis advisor of Erin Hunt (graduated May 2019).

JHU PhD dissertation committee member for Cencheng Shen (2015; second reader), Heng Wang (2015), Jordan Yoder (2016), Runze Tang (2017; second reader), Shangsi Wang (2018), Mingyue Gao (2019; second reader)

Professional Services

Refereed papers for *Annals of Statistics, Annals of Applied Statistics, Statistical Science, Journal of Computational and Graphical Statistics, IEEE Transactions on Signal Processing, IEEE Transactions on Network Science, Electronic Journal of Statistics, Journal of Machine Learning Research, IEEE Transactions on Knowledge and Data Engineering.*