

# David S. Choi

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## Contact

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## Education

Ph.D., Electrical Engineering, Stanford University (2004)  
Dissertation: *Optimization for Value Function Approximation*  
Advisor: Benjamin Van Roy  
M.S., Stanford University, Electrical Engineering (1999)  
B.S., Stanford University, Electrical Engineering (1998)

## Appointments

2012 - current Assistant Professor, Heinz College, Carnegie Mellon University,  
with courtesy appointment in Statistics  
2011-2012 Visiting Scholar, Department of Statistics, UC Berkeley  
2009-2011 Post-doctoral Fellow, School of Engineering, Harvard University  
2004-2009 Researcher, MIT Lincoln Laboratory, 2004-2009

## Research Interests

Statistics and machine learning for social networks and other network data:

1. Stochastic blockmodels, other network models with latent variables or unsupervised learning
2. Causal inference under interference
3. Application to social and biological networks

## Journal Publications

1. A Semidefinite Program for Structured Blockmodels. In preparation. [arxiv:1611.05407](https://arxiv.org/abs/1611.05407)
2. Co-clustering of Non-smooth Graphons. To appear in *The Annals of Statistics*. [arxiv:1507.06352](https://arxiv.org/abs/1507.06352)
3. Estimation of Monotone Treatment Effects in Network Experiments. To appear in *Journal of the American Statistical Association*. [arxiv:1408.4102](https://arxiv.org/abs/1408.4102)
4. Consistency of co-clustering for bipartite graph data. In *The Annals of Statistics*, 42(1), 29-63, 2014. With P.J. Wolfe. [arxiv:1212.4093](https://arxiv.org/abs/1212.4093).
5. Asymptotic normality of maximum likelihood and its variational approximation for stochastic blockmodels. In *The Annals of Statistics*, 41(4), 1922-1943, 2013. With P.J. Bickel, X. Chang, and H. Zhang. [arxiv:1207.0865](https://arxiv.org/abs/1207.0865)

6. Stochastic blockmodels with growing numbers of classes. In *Biometrika*, 99(2), 274-284, 2012. With P.J. Wolfe and E.M. Airolidi. arxiv:1011.4644.
7. Confidence sets for network structure. In *Statistical analysis and data mining*, 4(5), 461-469, 2011. With E.M. Airolidi and P.J. Wolfe. arxiv:1011.4644.
8. Generalized Kalman Filter for Fixed Point Approximation and Efficient Temporal-Difference Learning. In *Discrete Event Dynamic Systems*, vol. 16, no. 2, pp. 207-239, 2006. With B.V. Roy.

### Peer-reviewed Conference Publications

1. Confidence sets for network structure (short version). In *Advances in Neural Processing Systems (NIPS)*, 2011. With E.M. Airolidi and P.J. Wolfe.
2. Learnability of Latent Position Network Models. In *Statistical Signal Processing Workshop (SSP)*, 2011. With P.J. Wolfe.
3. Nonparametric Bayesian methods for Large Scale Multi-Target Tracking. In *Proceedings of the 40th Asilomar Conference on Signals, Systems, and Computers*, 2006. With E.B. Fox and A.S. Willsky.
4. Cost-optimal Dimensioning of a Large Scale Video on Demand System. *4th International Workshop on Networked Group Communication*, 2002. With E. Biersack and G. Urvoy-Keller.
5. Generalized Kalman Filter for Fixed Point Approximation and Efficient Temporal-Difference Learning (short version). In *Machine Learning: Proceedings of the Eighteenth International Conference (ICML)*, 2001. With B.V. Roy.

### Invited Talks

- “A semidefinite program for structured blockmodels”  
ICSA International Conference, 2016.
- “Co-clustering of nonsmooth graphons”  
INFORMS, 2016; JSM, 2016; Workshop on Networks, Random Graphs, and Statistics, Columbia University, 2016; Graph Limits and Statistics Workshop, Newton institute, 2016; ICSA Conference on Data Science, 2016; ICSA Applied Statistics Symposium, 2016; Department seminar, Applied Mathematics and Statistics, Johns Hopkins University, 2016; International Society for Non-Parametric Statistics (ISNPS) meeting 2015.
- “Estimation of monotone treatment effects in network experiments” Atlantic Causal Inference Conference (ACIC), 2017; Workshop on Causal Inference, Columbia University, 2016; Causal Inference Seminar, Johns Hopkins University, 2016; INFORMS, 2015; Conference on Digital Experiments (CODE), MIT 2015; JSM, 2015; WNAR, 2015.
- “Consistency of co-clustering for exchangeable arrays”  
Topic-contributed session, JSM, 2014; Joint Applied Statistics Symposium of ICSA and KISS, 2014; ISBIS and SLDM annual meeting, Duke University, 2014; Workshop on Statistical Inference for Network Models, Netsci 2014; Department seminar, Statistics, University of Wisconsin Madison, 2014; Stochastics and statistics seminar, MIT, 2013; INFORMS annual meeting,

2013; Department seminar, Statistics, University College London, 2013; Graph Exploitation Seminar, Lincoln Laboratory, 2013; Microsoft Research New England, 2013.

- “Stochastic Blockmodels with Growing Number of Classes”  
Workshop on Information and Decision in Social Networks (WIDS@LIDS), MIT 2011.
- “The Learnability of Link Prediction and Recommendation Systems”  
Stochastic Systems Group Seminar, MIT, 2010.

## Teaching

Heinz College, Carnegie Mellon University

*Exploring and Visualizing Data* (95-868)

*Decision Making Under Uncertainty* (95-760)

## Professional Activities

- Reviewer for *Annals of Applied Statistics*, *Annals of Statistics*, *Statistics and Computing*, *Electronic Journal of Statistics*, *Neural Computation*, *JRSS Series A*, *SIAM Journal on Matrix Analysis and Applications*, *AISTATS*, *NIPS*, *Social Networks*, *ICML*, *Network Science*, *IEEE Transactions on Network Science and Engineering*, *Journal of Machine Learning Research*, *WSDM*, *Journal of Causal Inference*
- Organizer/Organizing Committee Member for: Workshop on Dynamic Networks, Newton Institute, 2016; INFORMS 2016 invited session; JSM 2016 invited session, “Advances and novel problems in network statistics”; NIPS 2015 workshop, “Networks in the social and information sciences”; NIPS 2014 workshop, “Networks: from graphs to rich data”; INFORMS 2014 invited session; JSM 2014 topic-contributed session, “Progress in network estimation and comparison”; NIPS 2013 workshop, “Frontiers of network analysis: methods, models, and applications”; NIPS 2012 workshop, “Social network and social media analysis: methods, models and applications”.