

Dawn B. Woodard, Ph.D.

<http://people.orie.cornell.edu/woodard> • Contact information on website

I am a statistician with experience in the tech industry and in academia. I have done fundamental and applied work on data analytic methods for large-scale demand prediction, transportation, distributed systems, and biomedical applications.

PROFESSIONAL POSITIONS

Associate Professor (with tenure), Cornell University (Ithaca, NY), 7/2014 - Current

In the School of Operations Research and Information Engineering and Department of Statistical Science.

Assistant Professor, Cornell University (Ithaca, NY), 7/2008 - 6/2014

Research, teaching, and professional service. Research collaborations and graduate student projects with Walmart.com, Ernst & Young, Royal Bank of Canada, Citi Bike, and New York Presbyterian Hospital.

Visiting Scholar, Department of Statistics, Stanford University (Palo Alto, CA), 1/2015 – Current (On leave from Cornell).

Visiting Researcher, Microsoft Research (Redmond, WA), 8/2014 – 12/2014

I developed methods for predicting the reliability of driving time on arbitrary routes in a road network, using mobile phone GPS data and other data sources. Such methods could be used in mapping services (like Bing, Google, or Apple Maps) and fleet vehicle decision support software.

Collaboration with Toronto Paramedic Services (Canada), Ambulance Victoria (Australia), and Optima Corporation (New Zealand), 12/2008 - Current

Together with my lab group, I developed forecasting methods to be used in decision support software for ambulance fleets, including methods for predicting the time required for an ambulance to drive to the scene of an emergency, and methods for predicting ambulance demand over time and geographic location. We are now working with Optima Corporation to commercialize our methods.

Consultant, Microsoft Research (Mountain View, CA), 2/2009 – 5/2013

I developed methods to provide rapid automatic identification of performance “crises” occurring in a datacenter.

Consultant, Tibco Corp. (Makers of S-Plus Software; Durham, NC), 5/2006 - 12/2009

I developed software packages for Bayesian statistical modeling and analyzed drug safety data for Tibco clients. This included pharmacokinetic modeling and adaptive designs for dose-finding based on the efficacy-toxicity trade-off.

EDUCATION

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| Ph.D. in Statistics, Duke University Department of Statistical Science | 8/2002-12/2007 |
| <i>University Scholar and James B. Duke Fellow.</i> | |
| B.S. in Mathematical and Computational Science, Stanford University | 9/1997-6/2001 |
| <i>With honors and distinction.</i> | |

SOFTWARE

Languages: **C, C++, C#, Java, R, Matlab, SQL**. See my [open-source software packages](#).

SELECTED PUBLICATIONS (see also the [full list of publications](#))

DEMAND FORECASTING:

Predicting bike usage for New York City's bike sharing system. Singhvi, Singhvi, Frazier, Henderson, O'Mahony, Shmoys and Woodard (2015). *AAAI 2015 Workshop on Computational Sustainability*.

A spatio-temporal point process model for ambulance demand. Zhou, Matteson, Woodard, Henderson and Micheas (2015). *Journal of the American Statistical Association*.

Forecasting Emergency Medical Service call arrival rates. Matteson, McLean, Woodard, and Henderson (2011). *Annals of Applied Statistics*.

DRIVING TIME FORECASTING:

Predicting travel time reliability using mobile phone GPS data. Woodard, Nogin, Koch, Racz, Goldszmidt, and Horvitz (2015). Submitted, *Transportation Research Part C*.

Large-network travel time distribution estimation for ambulances. Westgate, Woodard, Matteson and Henderson (2015). Under revision for *European Journal of Operational Research*.

Travel time estimation for ambulances using Bayesian data augmentation. Westgate, Woodard, Matteson and Henderson (2013). *Annals of Applied Statistics*.

DISTRIBUTED SYSTEMS FAULT DIAGNOSIS:

Real-time identification of performance problems in large distributed systems. Goldszmidt, Woodard and Bodik (2011). In *Machine Learning and Knowledge Discovery for Engineering Systems Health Management*.

Online model-based clustering for crisis identification in distributed computing. Woodard and Goldszmidt (2011). *Journal of the American Statistical Association*.

Fingerprinting the datacenter: Automated classification of performance crises. Bodik, Goldszmidt, Fox, Woodard, and Andersen (2010) *EuroSys 2010: Proceedings of the 5th European Conference on Computer Systems*.

BIOMEDICAL STATISTICS:

Model-based image segmentation via Monte Carlo EM, with application to DCE-MRI. Woodard, Bilina Falafala and Crainiceanu (2015). Under revision for *Journal of Computational and Graphical Statistics*.

Hierarchical adaptive regression kernels for regression with functional predictors. Woodard, Crainiceanu, and Ruppert (2013). *Journal of Computational and Graphical Statistics*.

Performance assessment for radiologists interpreting screening mammography. Woodard, Gelfand, Barlow, and Elmore (2007). *Statistics in Medicine*.

GRANTS

National Science Foundation (NSF), Principal Investigator: “Statistical Analysis of Emergency Services Data,” 2009-2012. \$329,936, Service Enterprise Systems Program.

NSF, Principal Investigator: “Bayesian Computation, Guaranteed Efficient (or Intractable),” 2012-2015. \$150,000, Statistics Program.

NSF, Principal Investigator: “Asymptotically Efficient and Efficiently Computable Bayesian Estimation,” 2014-2017. \$120,000, Statistics Program.

INVITED SEMINARS: 60+, including the following for 2015

- Stanford University Statistics Department Seminar
 - University of Washington Machine Learning Seminar
 - University of Hong Kong School of Business Seminar
 - Joint IMS-Microsoft Research Workshop on Statistics and Data Science
 - IPAM Program on Mathematical Approaches for Traffic Flow Management
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TEACHING

- **Statistical Data Mining:** 2008-2014 (50-80 enrolled annually)
 - **Statistical Principles:** 2010, 2011, 2013 (16-24 enrolled annually)
 - **Engineering Probability and Statistics:** 2009, 2012 (141-220 enrolled annually)
 - **Monte Carlo Methods:** 2009 (8 enrolled)
 - **Duke University: Introductory Statistics and Probability:** 2004 (20 enrolled)
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AWARDS & MAJOR SERVICE POSITIONS

Associate Editor:

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| • Journal of the American Statistical Association | Current |
| • Stochastics: An International Journal of Probability & Stochastic Processes | Current |
| • Electronic Journal of Statistics | 2012 |

Visiting Fellowship, Isaac Newton Institute for Mathematical Sciences 2014

Ralph S. Watts '72 Excellence in Teaching Award, Cornell University 2012

Gertrude M. Cox Scholar, American Statistical Association 2003

University Scholar, Duke University 2002

James B. Duke Fellow, Duke University 2002

REFERENCES

- Available on request