

# Alp Kucukelbir

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## Education

Ph.D. Engineering & Applied Science, Yale University 2014  
Advisor: Hemant D. Tagare

B.A.Sc. (Hon.) Electrical Engineering, University of Toronto 2009

## Employment

Cofounder and Chief Scientist 2016–  
Fero Labs, New York, NY

Postdoctoral Research Scientist 2014–2017  
Department of Computer Science, Columbia University  
Advisor: David M. Blei

Postdoctoral Research Associate 2014  
Department of Computer Science, Princeton University  
Advisor: David M. Blei

## Thesis Award

Henry Prentiss Becton Award (*best thesis in engineering & applied science*) 2014

## Awards

NYC Ascent | Top 5 Project within Columbia, Cornell, NYU, and CUNY 2015

Yale University | Prize Teaching Fellowship 2013

Yale University | Teaching Center Fellowship 2011

NSERC | Alexander Graham Bell Scholarship (CGS D3) [Declined]

NSERC | Postgraduate Scholarship (PGS D3) 2011

Yale University | Advanced Graduate Leadership Fellowship 2010

Yale University | Robert E. Apfel Graduate Fellowship 2009

Yale University | George P. O'Leary Fellowship in Engineering 2009

NSERC | Alexander Graham Bell Scholarship (CGS M) [Declined]

Ontario Graduate Scholarship [Declined]

NSERC | Postgraduate Scholarship (PGS M) 2009

University of Toronto   Best Capstone Project Award	2009
University of Toronto   Leaders of Tomorrow Award	2008
University of Toronto   Class of 4T3 Engineering James Ham Award	2008
University of Toronto   Gordon Cressy Student Leadership Award	2008
International Engineering Consortium   William L. Everitt Award	2008
University of Toronto   Stewart Wilson Award	2007
Canada Millennium   National In-Course Excellence Award	2007

## Publications

### UNDER REVIEW

1. D. Tran, **A. Kucukelbir**, A.B. Dieng, M. Rudolph, D. Liang and D.M. Blei. Edward: A library for probabilistic modeling, inference, and criticism. *arXiv:1610.09787*

### REFEREED JOURNAL PAPERS

2. D.M. Blei, **A. Kucukelbir**, and J.D. McAuliffe. Variational Inference: A Review for Statisticians. *Journal of the American Statistical Association*, to appear 2016.
3. **A. Kucukelbir**, D. Tran, R. Ranganath, A. Gelman and D.M. Blei. Automatic Differentiation Variational Inference. *Journal of Machine Learning Research*, to appear 2016.
4. H.D. Tagare, **A. Kucukelbir**, F.J. Sigworth, H. Wang, and M. Rao. Directly Reconstructing Principal Components of Heterogeneous Particles from Cryo-EM Images. *Journal of Structural Biology*, 191(2) 2015.
5. **A. Kucukelbir**, F.J. Sigworth and H.D. Tagare. Quantifying the Local Resolution of Cryo-EM Density Maps. *Nature Methods*, 11(1) 2014.
6. **A. Kucukelbir**, F.J. Sigworth and H.D. Tagare. A Bayesian Adaptive Basis Algorithm for Single Particle Reconstruction. *Journal of Structural Biology*, 179(1) 2012.

### REFEREED CONFERENCE PAPERS

7. **A. Kucukelbir**, Y. Wang, and D.M. Blei. Evaluating Bayesian Models with Posterior Dispersion Indices. *International Conference on Machine Learning*, 2017.
8. Y. Wang, **A. Kucukelbir**, and D.M. Blei. Robust Probabilistic Modeling with Bayesian Data Reweighting. *International Conference on Machine Learning*, 2017.
9. **A. Kucukelbir**, R. Ranganath, A. Gelman and D.M. Blei. Automatic Variational Inference in Stan. *Neural Information Processing Systems*, 2015.
10. **A. Kucukelbir** and D.M. Blei. Population Empirical Bayes. *Uncertainty in Artificial Intelligence*, 2015.
11. **A. Kucukelbir**, A. Kushki and K.N. Plataniotis. A New Stochastic Estimator for Tremor Frequency Tracking. *IEEE Acoustics, Speech and Signal Processing*, 2009.

### REFEREED WORKSHOP PAPERS

12. **A. Kucukelbir** and D.M. Blei. Bumping Variational Inference. *Advances in Variational Inference*, NIPS 2014.
13. **A. Kucukelbir**, R. Ranganath, A. Gelman and D.M. Blei. Fully Automatic Variational Inference of Differentiable Probability Models. *Probabilistic Programming*, NIPS 2014.

## Professional Service

### EDITORIAL BOARD

Journal of Machine Learning Research

*Production Editor*

### SENIOR PROGRAM COMMITTEE

Neural Information Processing Systems 2017

*Area Chair*

International Conference on Machine Learning 2015

*Workflow Chair*

### JOURNAL REVIEWING

Bayesian Analysis

Stat

Journal of Machine Learning Research

Journal of Structural Biology

IEEE Transactions on Image Processing

IEEE Transactions on Signal Processing

IEEE Sensors Journal

### CONFERENCE REVIEWING

International Conference on Machine Learning

Artificial Intelligence and Statistics

Neural Information Processing Systems

Association for the Advancement of Artificial Intelligence

IEEE Acoustics, Speech, and Signal Processing

### WORKSHOP ORGANIZATION

Advances in Approximate Bayesian Inference at NIPS 2015

### PROFESSIONAL MEMBERSHIPS

American Statistical Association

International Society for Bayesian Analysis

Institute of Electrical and Electronics Engineers

Society for Industrial and Applied Mathematics

## Teaching Experience

### TRAINING

Yale Certificate of College Teaching Preparation 2013

### GUEST LECTURES

“Validating Variational Inference” 2016

“Probabilistic Modeling in Stan” 2015

“Computer Vision and Image Processing” (×3) 2011–2013

“Signal Processing using MATLAB” (×2) 2011–2012

“Image Processing and Machine Learning” 2010

### WORKSHOPS (DESIGNED & DELIVERED)

“Teaching Quantitative Reasoning” 2012

“Problem Based Learning” 2012

“Summer Teaching at Yale Day” 2012

“Compressed Course Syllabus Design” 2012

“Mentoring the Next Generation of Scientists” 2012

“Teaching with Technology” 2012

“Using Media and Visual Sources in the Classroom” 2012

“Fundamentals of Teaching Engineering” 2011–2013

### CONSULTATIONS (DELIVERED)

Political Science graduate student leading undergraduate discussion section 2013

Epidemiology graduate student delivering graduate guest lecture 2013

Biology graduate student delivering undergraduate lecture and discussion 2013

Sociology graduate student delivering undergraduate guest lecture 2012

Psychology graduate student leading undergraduate discussion section 2011

## Invited Talks

1. University of Massachusetts Amherst – AMHERST, MA 2017
2. Duke University – DURHAM, NC 2017
3. New York University – NEW YORK CITY, NY 2017
4. Rutgers University – NEW BRUNSWICK, NJ 2017
5. McGill University – MONTREAL, QC 2017
6. Harvard/MIT (Broad Institute) – CAMBRIDGE, MA 2016
7. ASA Joint Statistical Meetings – CHICAGO, IL 2016
8. DARPA PPAML Meeting – NEW YORK CITY, NY 2016
9. NYC Meetup (Big Data) – NEW YORK CITY, NY 2016
10. RStats Conference – NEW YORK CITY, NY 2016
11. University of Toronto – TORONTO, CA 2016
12. Princeton University – PRINCETON, NJ 2016
13. University of Chicago – CHICAGO, IL 2016
14. Information Theory and Applications Workshop – LA JOLLA, CA 2016
15. IMS-ISBA Bayes Comp Meeting – LENZERHEIDE, CH 2016
16. NIPS (Spotlight) – MONTREAL, QC 2015
17. Blackbox Learning and Inference at NIPS – MONTREAL, QC 2015
18. Google Research – NEW YORK CITY, NY 2015
19. UAI (Oral) – AMSTERDAM, NL 2015
20. Palantir – NEW YORK CITY, NY 2015
21. Yale University – NEW HAVEN, CT 2015
22. University of Toronto – TORONTO, CA 2015
23. Fields Institute – TORONTO, CA 2015
24. Advances in Variational Inference at NIPS – MONTREAL, QC 2014
25. Bogazici University – ISTANBUL, TR 2014
26. University of Cambridge – CAMBRIDGE, UK 2014
27. University of Colorado – BOULDER, CO 2014
28. Harvard University – CAMBRIDGE, MA 2013
29. Los Alamos National Laboratories – LOS ALAMOS, NM 2013

- 30. 3DEM Gordon Research Conference (Spotlight) – NEW LONDON, NH 2013
- 31. SIAM Imaging Science – PHILADELPHIA, PA 2013