

Adji Bousso Dieng

CONTACT INFORMATION Columbia University Department of Statistics abd2141@columbia.edu
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RESEARCH INTERESTS I am interested in Machine Learning, Deep Learning, Probabilistic Modeling, Bayesian Statistics, Variational Methods, and their applications in Natural Language Processing.

This past summer I worked at Microsoft Research's **Deep Learning Technology Center** with **Chong Wang** and **Jianfeng Gao** on the intersection of probabilistic graphical models and deep learning for language modeling.

EDUCATION **Columbia University**, New York, NY
Ph.D., Statistics *Expected: 2019*
Advisors: **David Blei** and **John Paisley**

Cornell University, Ithaca, NY
Master in Applied Statistics, May 2013
Supervisors: **David Lifka** and **Martin T. Wells**

Telecom ParisTech, Paris, France
Diplome d'Ingenieur (France's "Grandes Ecoles"), May 2013
Contact: **Eric Moulines**
Specializations: Mathematics and Computer Science
Spent my third year at Cornell for a double degree

Lycee Henri IV, Paris, France
Classes Preparatoires aux Grandes Ecoles, June 2009
Two-year intensive program in Mathematics, Physics and Chemistry
in preparation for the nationwide competitive examinations to the top
French Engineering and Science Schools

TEACHING EXPERIENCE I have been a teaching assistant for the following classes at Columbia University:

W4290 - Statistical Methods for Finance	Spring 2016
W4700 - Probability and Statistics for Data Science	Fall 2015
S1211 - Introduction to Statistics with Calculus	Summer 2015
W4315 - Linear Regression Models	Spring 2015
W4105 - Probability	Fall 2014

COMMUNICATION SKILLS Human Languages: Wolof(Native), French (Native), English (Fluent)
Machine Languages: Comfortable in Python, R, C#, Java, Shell, SQL, Stan, Tensorflow
Big Data Technologies: exposure in AWS and Spark (PySpark)
Version Control: Git, SVN

PROFESSIONAL SERVICE AND MEMBERSHIPS Student Volunteer ICLR 2017. Reviewer for NIPS 2017, ICML 2017, NIPS 2016, and Foundations and Trends in Machine Learning 2016. Member of the Institute for Mathematical Statistics and the American Statistical Association.

PUBLICATIONS **A. B. Dieng**, C. Wang, J. Gao, and J. W. Paisley. *TopicRNN: A Recurrent Neural Network with Long Range Semantic Dependency*. *International Conference on learning Representations*, 2017.

AND

PREPRINTS

A. B. Dieng, D. Tran, R. Ranganath, J. W. Paisley and D. M. Blei. *The χ Divergence for Approximate Inference*. Submitted to ICML 2017. <https://arxiv.org/abs/1611.00328>

D. Tran, A. Kucukelbir, **A. B. Dieng**, M. Rudolph, D. Liang, and D.M. Blei. *Edward: A Python library for probabilistic modeling, inference, and criticism*. <https://arxiv.org/abs/1610.09787>

TALKS AND
POSTERS

DeepLoria, Loria Laboratory(Talk) April 2017
New Developments in Neural Language Modeling Nancy, France

AI With The Best(Talk) April 2017
New Developments in Neural Language Modeling Online

NYAS Machine Learning Symposium (Poster) March 2017
Maximin Variational Inference New York, NY

OpenAI(Talk) January 2017
New Developments in Neural Language Modeling San Francisco, CA

IBM TJ Watson Research(Talk) December 2016
Contextual Neural Network-based Language Models and Applications Yorktown Heights, NY

Microsoft Research(Talk) August 2016
Contextual Neural Network-based Language Models and Applications Redmond, WA

RESEARCH
PROJECTS
AND
INTERNSHIPS

Research Internship: Deep Learning for Natural Language Processing

Deep Learning Technology Center
Microsoft Research, Redmond, WA
Supervisors: Chong Wang and Jianfeng Gao
Date: Summer 2016

The outcome of this internship was the TopicRNN model architecture which combines latent topics and recurrent neural networks to achieve state-of-the-art error rate for sentiment analysis on the IMDB 100K dataset.

Research Project: Jointly Modeling Ratings and Reviews via Poisson Tensor Factorization

Department of Statistics,
Columbia University, New York, NY
Supervisor: John Paisley
Date: Fall 2015

The goal of this project was to derive an algorithm to make personalized recommendations to users of sites like Yelp.

- Came up with a probabilistic model that jointly models reviews and ratings using Bayesian Poisson tensor factorization.
- Derived a new variational inference algorithm to learn the latent topics underlying the review corpus along with the user preferences and business attributes.

Research Internship: Graduate Research Assistant

Weill Cornell Medical College, New York, NY,
Supervisors: Prof. Martin Wells and Mary Ellen Charlson, MD
Date: Summer 2012

I carried out the statistical data analysis on data from a large clinical trial to infer the factors influencing visual field loss in patients suffering from glaucoma using R. This work led to a paper that was presented at the Meeting of the American Glaucoma Society (AGS) and was selected among the spotlight papers to be presented during the World Glaucoma Congress in Vancouver, Canada.

WORK EXPERIENCE

The World Bank, June 2013- July 2014

Washington, DC
Chief Risk Office, Market and Counterparty Risk Department
Junior Professional Associate

- Acted as co-lead for model development and analysis related to different risk measures including swap risk capital, liquid asset portfolio capital, Potential Future Exposure (PFW), stress testing and value-at-risk.
- Participated in the development of core infrastructure to automate existing models and processes.
- Part of the key team that modeled the changes in the equity duration strategy and the investment of equity.
- Built an Add-in using C# and SQL that allowed the department to go from quarterly reporting to daily reporting.

AWARDS

ICLR Travel Award March 2017

Microsoft Azure Research Award November 2016 - November 2017

Received a \$20K Azure grant to accelerate my research by leveraging the cloud.

Columbia University Dean Fellowship August 2014 - Present

The highest honor conferred upon entering the Statistics PhD program

IAD Fellowship August 2013-May 2013

Awarded the Cornell Institute for African Development Fellowship based on academic achievements

Pathfinder Foundation Scholarship 2007-2011

- First of the top three young girls selected to represent Senegal at the Pathfinder Foundation's excellence camp that gathered girls from West Africa, Morocco and Tunisia.
- Was selected to participate in the Mathematics and Sciences contest organized by the Pathfinder Foundation after the camp.
- Won the contest and was awarded a four-year scholarship to study abroad.

Laureate du Concours General July 2006

Philosophy Prize Winner of the Annual Senegalese Olympiads