Zhe Gan

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Research Interests

I focus on designing efficient and scalable Bayesian inference algorithms for deep learning models with applications in natural language processing and computer vision.

Education

- Duke University, Durham, NC
  Ph.D., Electrical and Computer Engineering 09/2013 - present
- Peking University, Beijing, China
  M.S., Electrical Engineering 09/2010 - 07/2013
  B.S., Electrical Engineering 09/2006 - 07/2010

Experience

- **Information Initiative at Duke (iiD)** 09/2013 - present
  Research Assistant. Advisor: Prof. Lawrence Carin
  (*i*) Developing deep generative models for image analysis, topic modeling and sequence modeling
  (*ii*) Designing stochastic gradient variational inference algorithms and stochastic gradient MCMC methods for scalable Bayesian inference
  (*iii*) Nonparametric discriminative factor modeling for gene-expression analysis
- **Adobe Research** 06/2015 - 09/2015
  Data Scientist Intern. Advisor: Hung Bui, Ph.D
  Recurrent neural networks (RNN) for NLP applications, including sentence classification, sentence retrieval and sentence generation
- **Microsoft Research Redmond** 05/2016 - 08/2016
  Research Intern. Advisor: Xiaodong He, Jianfeng Gao, Li Deng, Ph.D
  (*i*) image captioning: using deep learning techniques to improve the state-of-the-art of image and video captioning.
  (*ii*) deep conflation: using deep learning techniques to implement conflation for business data analytics.

Publications

Refereed Conference

1. Y. Pu, **Z. Gan**, R. Henao, X. Yuan, C. Li, A. Stevens and L. Carin "Variational Autoencoder for Deep Learning of Images, Labels and Captions", *Neural Information Processing Systems* (**NIPS**),2016
2. J. Song, **Z. Gan** and L. Carin "Factored Temporal Sigmoid Belief Networks for Sequence Learning", *Int. Conf. Machine Learning* (**ICML**),2016
3. C. Li, A. Stevens, C. Chen, Y. Pu, **Z. Gan** and L. Carin "Learning Weight Uncertainty with Stochastic Gradient MCMC for Shape Classification", *Computer Vision and Pattern Recognition (***CVPR***)* 2016, **Spotlight**
4. C. Chen, D. Carlson, **Z. Gan**, C. Li and L. Carin "Bridging the Gap Between Stochastic Gradient MCMC and Stochastic Optimization", *Artificial Intelligence and Statistics (***AISTATS***)* 2016, **Oral**

5. **Z. Gan**, C. Li, R. Henao, D. Carlson and L. Carin "Deep Temporal Sigmoid Belief Networks for Sequence Modeling", *Neural Information Processing Systems* (**NIPS**), 2015
6. R. Henao, **Z. Gan**, J. Lu and L. Carin "Deep Poisson Factor Modeling", *Neural Information Processing Systems* (**NIPS**), 2015
7. **Z. Gan**, C. Chen, R. Henao, D. Carlson and L. Carin "Scalable Deep Poisson Factor Analysis for Topic Modeling", *Int. Conf. Machine Learning* (**ICML**),2015
8. **Z. Gan**, R. Henao, D. Carlson and L. Carin "Learning Deep Sigmoid Belief Networks with Data Augmentation", *Artificial Intelligence and Statistics* (**AISTATS**), 2015

Book Chapter

1. **Z. Gan**, X. Yuan, R. Henao, E. Tsalik and L. Carin "Inference of Gene Networks Associated with the Host Response to Infectious Disease", Chapter 13 of Book *Big Data Over Networks*.

Software Skills

Python, Matlab, R and C

Awards

ECE Fellowship, Duke University, 2013
National Scholarship, Department of Minister of Education of China, 2010-2013.

Teaching Experience

Teaching Assistant 09/2014-12/2014
STA 601 - Bayesian and Modern Statistics
Instructor: David Dunson, Ph.D

Teaching Assistant 01/2015-05/2015
ECE 587 - Information Theory
Instructor: Ahmad Beirami, Ph.D

Graduate Coursework

Bayesian and Modern Statistics, Probabilistic Machine Learning, Advanced Machine Learning, Statistical Inference, Statistical Computation, Information Theory, Graphical Models & Inference, Optimization For Engineers