Zhe Gan

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Objective

A summer research internship in the area of machine learning

Research Interests

I focus on designing efficient and scalable Bayesian inference algorithms for deep learning models with applications in NLP and image analysis.

Education

Duke University, Durham, NC

Ph.D., Electrical and Computer Engineering, 09/2013 - 09/2018 (Expected)

- Advisors: Lawrence Carin, Ph.D

Peking University, Beijing, China

M.S., Electrical Engineering, 09/2010 - 07/2013

B.S., Electrical Engineering , 09/2006 - 06/2010

Publications

1. **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
2. R. Henao, **Z. Gan**, J. Lu and L. Carin "Deep Poisson Factor Modeling", *Neural Information Processing Systems* (NIPS), 2015
3. **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.
4. **Z. Gan**, R. Henao, D. Carlson and L. Carin "Learning Deep Sigmoid Belief Networks with Data Augmentation", *Artificial Intelligence and Statistics* (AISTATS), 2015.
5. **Z. Gan**, X. Yuan, R. Henao, E. Tsalik and L. Carin "Inference of Gene Networks Associated with the Host Response to Infectious Disease", to appear in the Book *Big Data Over Networks*.

Papers Submitted

1. J. Song, **Z. Gan** and L. Carin "Generalized Temporal Sigmoid Belief Networks for Sequence Generation and Classification", submitted to AISTATS 2016.
2. C. Chen, D. Carlson, **Z. Gan** and L. Carin "Bridging the Gap between Stochastic Gradient MCMC and Stochastic Optimization ", submitted to AISTATS 2016.
3. R. Henao, **Z. Gan** and L. Carin "Deep Sigmoid Belief Networks for Differential Gene Expression Analysis", preparing.

Experience

Data Scientist Intern 06/2015 - 09/2015
Adobe Research
Advisor: Hung Bui, Ph.D
Projects

- **Empirical Evaluation of Recurrent Neural Networks for Text Modeling**
  We developed RNN classifier for sentence classification and RNN auto-encoder for sentence embedding. We show empirical results on a number of tasks we considered, e.g. sentiment analysis, question type classification, sentence retrieval, and sentence generation.

Research Assistant 09/2013 - present
Information Initiative at Duke (iiD), Duke University
Advisor: Lawrence Carin, Ph.D
Projects

- **Deep Temporal Sigmoid Belief Networks for Sequence Modeling**
  Deep dynamic generative models are developed to learn sequential dependencies in time-series data.
- **Deep Poisson Factor Modeling**
  We propose a new deep architecture for topic modeling, based on Poisson Factor Analysis (PFA) modules.
- **Scalable Deep Poisson Factor Analysis for Topic Modeling**
  A new framework for topic modeling is developed, based on deep graphical models, where interactions between topics are inferred through deep latent binary hierarchies.
- **Learning Deep Sigmoid Belief Networks with Data Augmentation**
  Deep directed generative models are developed. The multi-layered model is designed by stacking sigmoid belief networks.
- **Inference of Gene Networks Associated with the Host Response to Infectious Disease**
  Discriminative factor models are developed for gene-expression analysis. Bayesian shrinkage priors and nonparametric techniques are employed.

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

References

Available upon request