Shashank Gupta

Basic Information

Graduating: December 2017
Visa Status: F1 Student (Eligible for OPT)
Citizenship: India

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Education

University of Illinois at Urbana Champaign — **Aug'15 – Dec'17**
Master of Science, Computer Science — **3.83/4.0**
Thesis Adviser: Prof. Dan Roth

Birla Institute of Technology and Science, Pilani, India — **Aug'08 – June'12**
Bachelor of Engineering (Hons.), Computer Science — **3.42/4.0**

Research Interests

Natural Language Processing: Question Answering; Dialogue Systems; Abstractive Summarization; Language Generation; (Sent./Doc.) Representation Learning.
Machine Learning: Deep Structured Models; Deep Generative Models; Distributed ML; Deep Reinforcement Learning, Model Interpretability & Adversarial Attacks.

Technical Skills

Languages: *Proficient*: Python, Java | *Basic*: C, C++, SQL, HTML/CSS, JavaScript, JSP/Servlets
Toolkits: Tensorflow, Hadoop, Pig, CogComp-NLP, Illinois-SL, Matlab, LaTeX

Publications

Shashank Gupta, Varun Chandramouli and Soumen Chakrabarti. *"Web-scale Entity Annotation Using MapReduce"*. In: High Performance Computing **(HiPC), 2013** [PDF]

Research Experience

Research Assistant:

- **UIUC**: Cognitive Computation Group *(Aug'15 - Present)*
  Themes: Unsupervised Text Classification; Text Generation; Structured Learning
- **Max Planck Institute (MPI)**, Databases & Info. Sys. Group *(Aug'14 - April'15)*
  Themes: Named Entity Disambiguation; KB Construction
- **IIT-Bombay**: InfoLab *(Jan'13 - June'14)*
  Themes: Entity Search & Disambiguation; Distributed Training and Indexing
- **Yahoo Labs**: Ad-Predict Team *(June - Dec'12)*
  Themes: Display Ad-Platform; User-Response Prediction
- **Yahoo R&D**: User Data & Analytics Team *(Jan - June'12)*
  Themes: Search Ad-Platform; User-Response Prediction; Automated Account Optim.

Teaching Experience

Teaching Assistant:

- **UIUC**: Machine Learning, CS446 *(Aug - Dec'16)*
- **IIT-Bombay**: Web Search and Mining, CS635 *(July - Nov'13)*
- **BITS-Pilani**: Operating Systems, CS C372 *(Aug - Dec'11)*

Recent Projects

Unsupervised Text Classification *(Aug'15 - Present)*
Guide: Prof. Dan Roth, UIUC Web

– Key idea is to embed documents & topics using World Knowledge, and then compute similarity.
– Developed new topic-sensitive word and entity embeddings by augmenting the Word2Vec loss, and used their composition to represent documents.
– Identifying the need to learn the composition itself, modeled it as a One-shot Topic Classification problem using Distant Supervision from Wikipedia.
– An empirical study of architectures revealed the importance of hierarchical modeling & attention.
– Currently using VGG-style networks with skip connections to learn topic-sensitive document embeddings from Wikipedia, where the Wikipedia categories are the labels.

Conditional Text Generation *(Jan - May'17)*
Guide: Prof. Svetlana Lazebnik, UIUC Web

– Experimented with Conditional GANs and VAEs for sentiment-conditioned review generation.
– Experimented with both Policy-Gradient and Gumbel-Softmax, and used Curriculum Learning with a conditional language model to bootstrap the GANs.

Joint NER, Relation Extraction and CoReference Resolution *(Jan - May'16)*
Guide: Prof. Dan Roth, UIUC Web | Github

– Aim was to try out joint modeling of NER, Relation Extraction and CoRef with constraints.
– Simple coupling of classifiers without constraints showed poor performance.
– Developed a framework for joint training with Constrained-Conditional Models, using Illinois-SL and CogComp-NLP.

Past Projects

Agile NERD for KB-Lifecycle *(Aug'14 - April'15)*
Guide: Prof. Gerhard Weikum, Prof. Denilson Barbosa, MPI Web

– Identified the problem of separating mentions of emerging entities from mentions worthy of abstention as the key hurdle in achieving real-time KBs and iterative entity annotation on corpus.
– Used the disagreement between an ensemble of annotators to signal abstention on a given mention.

Scalable Entity Disambiguation and Search *(Jan'13 - June'14)*
Guide: Prof. Soumen Chakrabarti, IIT-Bombay Web | Publication | CSAW

– Designed a scalable entity annotation and indexing framework in Hadoop. Designed custom-key partitioning strategies to mitigate the load-skew problem of a simple MapReduce implementation.
– Improved the accuracy of the entity disambiguation system by extracting more training data from Wikipedia and engineering features.
– Developed hadoop-based solutions for distributed training of millions of models.

User Response Prediction for Non-Guaranteed Display Ad Delivery *(June - Dec'12)*
Guide: Prof. Sanjay Chawla, Prof. Shivaram Kalyanakrishnan, Yahoo Labs Web

– Improved the accuracy of the user-click prediction model by mining new features.
– Analyzed Petabytes of data for feature signal & coverage.
– Used that analysis to find a training data partitioning strategy that showed promise when different models were trained on those different partitions.

Automated Campaign Optimization for Search Advertising *(Jan - June'12)*
Guide: Ajay Sharma, Director, UDA, Yahoo R&D Web

– Protoyped a tool that automated the account optimization for advertisers.
– Developed models for predicting #impressions, #clicks, #conversions, and handled sparsity issues by using community detection algorithms to cluster competitors together.
– Ultimately, given a budget, the tool used resource allocation algorithms to select appropriate bid amounts for various targeting combinations.

Web Search Personalization on the Client-side *(Aug'10 - Dec'11)*
Guide: Prof. Mangesh Bedekar, BITS-Pilani Web

– Prototyped a browser extension that modeled the user intention and re-ranked search results on the client-side.
– A neural model was learned to identify useful pages from user's browsing history using user's browsing patterns as features.
– Those pages were then used to build a user profile over time, which was ultimately used to personalize the search results on the client-side.

Online Comprehensive Examination Software *(May - July'10)*
Guide: P.B. Kotur, Director, Talent Transformation, Wipro InfoTech Web

Developed a Subjective Online Examination application using JSP and Servlets.

Relevant Coursework

Machine Learning, NLP, Structured Learning, Recent Trends in Deep Learning, Graphical Models, Web Search & Mining, Organization of Web Information, Advanced Data Mining

Talks

"Web-scale Entity Annotation Using MapReduce".
Invited Talk: Yahoo Summer School on IR & the Semantic Web, IISc, Bangalore [Slides]

References

Dan Roth, *Professor, UIUC* — danr@illinois.edu *[Thesis adviser]*
Soumen Chakrabarti, *Associate Prof., IIT-Bombay* — soumen@cse.iitb.ac.in *[R.A. adviser]*
Denilson Barbosa, *Associate Prof., Univ. of Alberta* — denilson@ualberta.ca *[R.A. adviser]*
Shivaram Kalyanakrishnan, *Assistant Prof., IIT-Bombay* — shivaram@cse.iitb.ac.in *[R.A. adviser]*