Abhirut Gupta

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RESEARCH INTERESTS

My research interest lies in creating algorithms for understanding of natural language for applications like Information Retrieval or Dialogue Systems. I would like to explore techniques to train models with little "domain specific" supervision.

EDUCATION

- **Indian Institute of Technology (IIT), Bombay**
  Master of Technology, Computer Science and Engineering; CGPA: 9.74   *July. 2012 – Jun. 2014*

- **National Institute of Technology (NIT), Nagpur**
  Bachelor of Technology, Computer Science and Engineering; CGPA: 7.06   *Jul. 2008 – May. 2012*

WORK EXPERIENCE

- **IBM Research**   Bangalore, India
  Research Engineer   *July 2014 - Present*
  - **Knowledge Graph based Conversation for Automating Technical Support** Created an ontology for troubleshooting technical support problems, and extracted relations from product documentation and past tickets. Designed a conversational agent to traverse the knowledge graph given a new problem, and return a resolution.
  - **Sentiment Extraction and Aggregation** In a project for a major bank, designed a rule based sentiment extraction engine for a fixed set of entities from a fixed set of document types. Also designed an aspect based sentiment aggregator to combine sentiments from multiple text snippets and aspects for each entity.

- **IIT Bombay**   Bombay, India
  Graduate Teaching Assistant   *Jul 2012 - May 2014*
  - **Computer Programming** Autumn 2012, Spring 2013
  - **Machine Learning** Autumn 2013
  - **Advanced Machine Learning** Spring 2014

RESEARCH EXPERIENCE

- **Procedure Extraction from Technical Support Documentation**
  IBM Research   *May 2017, Present*
  - Extract installation, configuration, and troubleshooting procedures from technical support documentation for a guided troubleshooting conversation system or automation

- **Evolution of Ideas in Academic Publications**
  Open Science Collaboration Project, Adviser: Prof. Niloy Ganguly   *May 2017, Present*
  - Study the evolution of ideas by tracing their flow through academic publications
  - In particular study the reasons why some papers become "seminal"

- **Timeline Generation for Fluent Quantities**
  Master of Technology Project, Adviser: Prof. Sunita Sarawagi   *December 2013 - June 2014*
  - We define temporaly variying quanities (like population of a country) as fluent quantities
  - Created a method for joint extraction and inference for generating a timeline of responses for such quantities which showed a **20%** improvement in MAP and **32%** improvement in average probability of ground truth data over independent extractions

- **Student Performance Prediction System**
  Course Project: Machine Learning, Adviser: Prof. Sunita Sarawagi   *Autumn 2012*
  - In-class Kaggle Competition to predict the probability of students answering questions correctly based on the previous performance of students on SAT, GMAT, and ACT.

- Implemented a temporal collaborative filtering model to rank 3rd among 28 teams and approximately 100 students

- **Index tuning for PostgreSQL**
  Course Project: Implementation Techniques in Databases, Adviser: Prof. S. Sudarshan   *Autumn 2012*
  - Developed an index tuning tool for PostgreSQL to find the optimal set of indices for a given workload of SQL queries.
  - Extended the PostgreSQL source code to support the creation of "fake" indices for calculating index cost.

- **Large Scale Collaborative Filtering**
  Course Project: CS 709 Convex Optimization, Adviser: Prof. Ganesh Ramakrishnan   *Autumn 2013*
  - Developed a matrix factorization based movie recommendation system on the MovieLens dataset (10 million user-movie ratings)
  - Implemented distributed stochastic gradient descent for learning

Publications

- **Abhirut Gupta**, Arjun Akula, Gargi Dasgupta, Pooja Aggarwal, and Prateeti Mohapatra. Desire: Deep Semantic Understanding and Retrieval for Technical Support Services. ICSOC 2016 Workshops

Patent Applications

- System and Method for Instance Specific Aspect Based Cross Documents Sentiment Aggregation. Application Number 14/937551

- Deep Learning based Unsupervised Event Learning for Economic Indicator Prediction. Application Number 15/258176

Achievements

- **All India Rank 36** in GATE 2012 (Graduate Aptitude Test in Engineering) amongst over 150,000 applicants

- Awarded a Certificate of Merit by CBSE for being in the **top 0.1%** in Computer Science, Class 12th (All India), 2008

- Ranked 2nd in a class of 110 students at IIT Bombay, 2014

- Eminence and Excellence Award for excellent work in improving accuracy of the support solution at IBM, 2017

- Manager's Choice Award

Skills

Programming Languages	Java, Python, NodeJS, C++
Tools	LingPipe, Weka, Lucene, scikit-learn

Selected Graduate Courses

Natural Language Processing, Foundations of Machine Learning, Implementation Techniques in Relational Databases, Advanced Machine Learning, Web Search and Mining, Organization of Web Information, Convex Optimization