Abhirut Gupta
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Research Interests

My research interest lies in exploring application of machine learning techniques to open problems in Natural Language Processing. Areas of interest include Natural Language Processing, Information Extraction, Information Retrieval, and Machine Learning.

Education

- **Indian Institute of Technology (IIT), Bombay**
  Master of Technology, Computer Science and Engineering; CGPA: 9.74 (Class Rank 2/110) *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 for one 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 150 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

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

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