Abhirut Gupta

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Research Software Engineer at IBM Research. I work on complex question understanding towards improving automatic resolution of technical support problems. My research lies at the intersection of Natural Language Processing and Information Retrieval.

Education

- **Indian Institute of Technology (IIT), Bombay**
  Master of Technology, Computer Science, CGPA: 9.74 out of 10 *2012 – 14*
  Masters Thesis: Timeline Generation for Fluent Quantities, Advisor: Prof. Sunita Sarawagi
- **Visvesvaraya National Institute of Technology (NIT), Nagpur**
  Bachelor of Technology, Computer Science, CGPA: 7.06 out of 10 *2008 – 12*

Work Experience

- **IBM Research** **Bangalore**
  Research Software Engineer *2014 – Present*
  - Worked on various NLP problems towards automation of Technical Support at IBM. Special focus on understanding of Technical Support tickets, to provide better resolution
  - Direct contributions to the production system *Watson for Support*. Multiple patent applications, and research papers from work I initiated and led in the project
  - 2 Outstanding Technical Achievement Awards
- **Indian Institute of Technology (IIT), Bombay** **Mumbai**
  Teaching Assistant *2012 – 2014*
  - Computer Programming *Autumn 2012, Spring 2013*
  - Machine Learning *Autumn 2013*
  - Advanced Machine Learning *Spring 2014*

Research Experience

- **Understanding Technical Support Problems**
  IBM Research
  Led work on designing models for parsing technical support problems, syntactically and semantically. In [2], we extract attributes like *symptom*, *intent*, *attempt* from complex technical support questions and demonstrate importance through improvement in retrieval results. In another ongoing work, we segment support problems to identify human written, and various machine generated content. This segmentation also helps us predict tokens in support problems likely to appear in the correct answer.
- **Understanding Technical Support Documents**
  IBM Research
  Created a system to identify and extract procedures from publicly available technical support documents on the web [1]. Mining these procedures helped automatic bootstrap of a chatbot for assisting users in diagnosing and resolving problems, instead of merely replying with urls.

- **Timeline Generation for Fluent Quantities**
  Masters Thesis. Advisor: Prof. Sunita Sarawagi *2013 – 2014*
  Defined fluent quantities as temporally varying quantities (like population of a country). Created a method of joint extraction and inference for generating a timeline of responses for such quantities from a large web corpus, which showed a **20%** improvement in MAP and **32%** improvement in average probability of ground truth data over independent extractions

Technical and Personal skills

- **Programming Languages:** Java, Python (Proficient), C++ (Beginner)
- **Tools and Libraries:** Tensorflow, Weka, scikit-learn, nltk

Achievements

- Awarded a Certificate of Merit by CBSE for being in the **top 0.1%** in Computer Science, Class 12th (All India), 2008
- **All India Rank 36** in GATE 2012 (Graduate Aptitude Test in Engineering) amongst over 150,000 applicants
- Ranked 2nd in the graduating class of 110 Masters students at IIT Bombay, 2014
- 2 Outstanding Technical Achievement Awards for work on automation of technical support in IBM

Selected Graduate Courses

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

Patents

- Techniques for instance-specific feature-based cross-document sentiment aggregation. US20170132309A1
- Deep Learning based Unsupervised Event Learning for Economic Indicator Predictions. US20180068330A1

Publication

1. **Abhirut Gupta**, Abhay Khosla, Gautam Singh, Gargi Dasgupta. Mining Procedures from Technical Support Documents. 2018. arXiv preprint arXiv:1805.09780
2. **Abhirut Gupta**, Anupama Ray, Gautam Singh, Gargi Dasgupta, Pooja Aggarwal, and Prateeti Mohapatra. Semantic Parsing for Technical Support Questions. 2018. COLING 2018
3. Prateeti Mohapatra, Yu Deng, **Abhirut Gupta**, Gargi Dasgupta, Amit Paradkar, Ruchi Mahindru, Daniela Rosu, Shu Tao, Pooja Aggarwal. Domain Knowledge Driven Key Term Extraction for IT Services. 2018. ICSOC 2018
4. **Abhirut Gupta**, Arjun Akula, Gargi Dasgupta, Pooja Aggarwal, and Prateeti Mohapatra. Desire: Deep Semantic Understanding and Retrieval for Technical Support Services. 2017. ICSOC 2016 Workshops