

# Saurabh Garg

Engineer

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## Research Interests

Machine Learning, Information Retrieval, Natural Language Processing, Speech Recognition

## Education

**Bachelor of Technology, Indian Institute of Technology Bombay** 2014 – 2018

B.Tech with Honors in Computer Science and Engineering

Minor in Applied Statistics and Informatics

**GPA: 9.51/10.0**

**Senior Secondary Examination, CBSE**

2014

**Percentage: 96.8**

## Publications

### Journal Pre-prints

**Neural Architecture for Question Answering Using a Knowledge Graph and Web Corpus**

Uma Sawant, **Saurabh Garg**, Soumen Chakrabarti, Ganesh Ramakrishnan

(Under submission) Information Retrieval Journal, 2018

**Estimating Uncertainty in MRF-based Image Segmentation: An Exact-MCMC Approach**

Suyash Awate, **Saurabh Garg**, Rohit Jena

(Under submission) Medical Image Analysis, 2018

### Conference

**Code-Switched Language models using Dual RNNs and Same-Source Pretraining**

(Awarded Non-Student Travel Grant)

**Saurabh Garg\***, Tanmay Parekh\*, Preethi Jyothi

(\* joint first authors)

Proceedings of Empirical Methods in Natural Language Processing (EMNLP), 2018

**Uncertainty Estimation in Segmentation with Perfect MCMC Sampling in Bayesian MRFs**

**Saurabh Garg**, Suyash Awate

Proceedings of Medical Image Computing & Computer Assisted Intervention (MICCAI), 2018

**Dual Language Models for Code Mixed Speech Recognition**

(Awarded ISCA Student Travel Grant)

**Saurabh Garg**, Tanmay Parekh, Preethi Jyothi

Proceedings of Interspeech 2018 (19th Annual Conference of ISCA)

## Academic Achievement

- Awarded **Institute Academic Award** by IIT Bombay for exceptional academic performance
- Received **Undergraduate Research Award** by IIT Bombay for my research contributions
- Secured **All India Rank 93** in JEE (Main) and **154** in JEE (Advanced) among around 1.5 million candidates
- Selected for **KVPY** scholarship '14 organized by the Government of India

## Major Research Projects

**Markov Chain Monte Carlo Sampling,**

Dec 2016 – April 2018

Undergraduate Thesis | Guided by: Prof. Suyash Awate

IIT Bombay

- Formulated an efficient perfect sampling method to sample from a general chain using ideas from bounding chains and showed its efficacy for uncertainty estimation in Medical MRI images

**Speech Recognition in code switched speech,**

July 2017 – May 2018

Undergraduate Research Project | Guided by: Prof. Preethi Jyothi

IIT Bombay

- Developed a framework called dual language model (DLM) for speech recognition system in code switched speech, wherein a speaker switches between languages within a single utterance

**Question Answering using KG and Web Corpus**

Summers 2018

Research Project | Guided by: Prof. Soumen Chakrabarti

IIT Bombay

- Worked on improving the performance of state-of-the-art question answering systems with the aid of web corpus along with KG for both telegraphic queries and natural language queries

### **SDN and OpenFlow conformance**

Research Engineering Internship | *Virtualization Platform Lab*

Summers 2017  
*Samsung HQ, South Korea*

- Studied Software Defined Networking (SDN) and designed conformance testbed on Open Network Operating System (ONOS) to test OpenFlow

### **Multiword Expressions and Error Tracking in IR,**

Research project | *Guided by: Prof. Pushpak Bhattacharyya*

July 2016 – November 2016  
*IIT Bombay*

- Studied WordNet-based features and word embeddings approach to detect compositionality of Multiword Expressions in IR. Designed a framework for error detection and correction tool that provides the ability to perform pseudo error-correction in a large-scale search engine system

### **Approximation algorithms for weighted b-Matching**

Research Internship | *Guided by: Prof. Alex Pothen*

Summers 2016  
*Purdue University, USA*

- Worked on designing an approximation algorithm for a variant of stable fixtures problem

## **Teaching Experience**

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### **Undergraduate Teaching Assistant**

- Introduction to Machine Learning, Prof. Preethi Jyothi (*CS 419*) Spring 2018
- Data Analysis and Interpretation, Prof. Suyash Awate (*CS 215*) Autumn 2017
- Computer Programming and Utilisation, Prof. Sunita Sarawagi (*CS 101*) Spring 2017
- Computer Programming and Utilisation, Prof. Benard Menezes (*CS 101*) Autumn 2016
- Quantum Physics and Application, Prof. Aftab Alam (*PH 107*) Autumn 2015
- Involved in setting up assignments, examinations, evaluating answer sheets and helping students by conducting tutorial sessions

## **Relevant Coursework**

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- **Machine Learning:** Optimization, Web Search and Mining, Organization of Web Information, Automatic Speech Recognition, Medical Image Processing, Digital Image Processing, Foundations of Machine Learning, Artificial Intelligence, Data Analysis and Interpretation, Statistical Inference, Regression Analysis