Pararth Shah

Contact Information

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Research Interests

Machine learning, data mining, parallel and distributed processing, data visualization.

Education

Indian Institute of Technology - Bombay, Mumbai, India.

Bachelor of Technology (Honors) **July 2009 – August 2013**

- Major: Computer Science & Engineering
- CGPA: 9.83/10.00

Academic Honors

Recipient of the **Miss Jayati Deshmukh Memorial Gold Medal** for graduating with the highest CGPA among Computer Science & Engineering majors (2013).

Two time recipient of the **Institute Academic Award** for outstanding academic achievement (2010, 2012).

Secured AP grade for excellent performance in CS 306: Compilers Lab, CS 101: Introduction to Computer Programming and HS 101: Economics (2009, 2012)

Secured 10.0/10.0 GPA in 1st, 6th and 8th semesters (2009, 2012, 2013)

Secured All India Rank 4 in IIT-Joint Entrance Examination (2009) among 400,000 entrants.

Secured All India Rank 12 in All India Engineering Entrance Examination (2009) among 1,000,000 entrants.

Recipient of the National Talent Search Examination Scholarship (2007 - present).

Work Experience

Google Summer of Code 2013 **June 2013 - September 2013**

Software Developer (Funf.org) Mentor: Alan Gardner

Added support for automated capturing of raw audio, video and timelapse data from Android devices.
Spearheaded work on revamping the Funf scheduler system to incorporate complex data collection tasks, for example, collecting the accelerometer data everytime the Android device is in the activity state "driving".

Google, Inc, Los Angeles, USA. **May 2012 - July 2012**

Software Engineering Intern Mentor: Marzia Polito

Conducted research on internal text classification and disambiguation systems.
Worked with machine learning systems and performed analysis of large scale data using distributed algorithms to explore issues in text classification and disambiguation.

INRIA, Sophia Antipolis, France. **May 2011 - July 2011**

Research Intern Mentor: Frederic Cazals

Worked on geometric algorithms for modelling protein molecules as a collection of balls.
Implemented a greedy algorithm for approximating the volume of a union of balls using balls centered on the medial axis.
Analyzed the worst case performance of the algorithm on real protein molecules.
Worked with the open source graphics library CGAL for low-level graphics primitives.

Google Summer of Code 2011 **May 2011 - August 2011**

Software Developer (Point Clouds Library) Mentor: Michael Dixon

Developed a framework for automated benchmarking of algorithms that extract features from 3D point clouds.
Gathered runtime statistics of existing algorithms over real-world datasets, to answer questions regarding efficiency and usability of the algorithms.
Worked with the PCL developer community to tailor the framework towards real use-cases.

Undergraduate Teaching Assistant **July 2012 - November 2012**

Course: Foundations of Machine Learning Prof: Sunita Sarawagi

Assisted the professor in solving students' queries regarding material taught in class and conducting class tests.
Formulated and conducted a data mining contest on Kaggle, getting students to apply the concepts learnt in class on a real-world dataset.

Key Projects

Bachelor's Thesis **July 2012 - November 2012**

Cost-based Optimizers For Parallel Data Frameworks Prof: S. Sudarshan

Surveyed recent advances in cost-based optimization techniques in traditional and distributed database systems.
Worked on integrating a variant of the Volcano optimizer generator with Hyracks, a data-parallel platform for running jobs on clusters of shared-nothing machines.
Studied issues in query optimization for distributed databases based on the MapReduce programming model.

Undergraduate Research Project **Jan 2012 - November 2012**

Collective Entity Disambiguation Prof: Ganesh Ramakrishnan

Researched the state-of-the-art techniques for spotting and disambiguation of named entities in unstructured text.
Worked on extracting features from the Wikipedia page of an entity for modelling the likelihood of entities co-occurring on a webpage.
Formulated the disambiguation problem as a MAP estimation on a Markov Random Field of the candidate entities.

Convex Optimization Course Project **October 2012 - November 2012**

Submodular Optimization Prof: Saketh Nath

Studied submodular function optimization techniques, including properties of submodular functions and the relation to convex optimization via the Lovasz extension.
Experimented with the submodular optimization algorithms available in the SMO Matlab package, and compared their performance with the optimization of the equivalent convex problem using the MOSEK optimization software.

Embedded Systems Lab Project **Feb 2012 - April 2012**

Android Interface For Firebird Bot Prof: Kavi Arya

Developed an Android library app for controlling the Firebird V robot via any Android device.
Built a generic command interpreter in C which runs on the Firebird robot, and a two-way fault tolerant communication protocol for efficiently transferring short messages over Bluetooth.
Developed sample Android apps to control the Firebird bot from the Android device and perform non-trivial tasks.

Undergraduate Research Project **July 2011 - November 2011**

Social Search - Ranking Users In A Social Network Prof: Ganesh Ramakrishnan

Explored the question of efficiently identifying experts in a users social network for answering a search query.
Developed models for predicting likelihood of a query being answered by a friend in the social network, considered variants of collaborative filtering taking into account the asymmetric influence of users.

Database & Information Systems Course Project **September 2011 - November 2011**

Personalized News Aggregator Prof: S. Sudarshan

Developed a Web-application which collects latest news stories from the Internet and presents the users with those stories that suit his/her preference.
Performed semantic analysis and categorization of the news stories into Freebase topics.

Abstractions & Paradigms in Programming Lab **February 2010 - April 2010**

Focused Web Search Engine Prof: Amitabha Sanyal

Developed a web crawler capable of crawling pages linked from a specified set of seed URLs up to a specified depth, and indexing the keyword based content of the crawled pages.
Used information retrieval techniques to facilitate search queries on the data collected.
Secured the maximum score and AA grade in this lab for single-handedly implementing a search engine as a first year undergraduate student.

Technical Skills

Programming	C++, Java, Bash, Python, Scheme (Lisp)
Web Development	HTML/CSS, JavaScript/AJAX, Django
Database	MySQL, Hive, Pig, Hyracks, SNAP
Software Packages	Hadoop, Mahout, Lucene, Weka, Scilab, OpenCV, PCL

Extra Curriculars

Won 2^{nd} Prize at Morgan Stanley QED 2012, an event showcasing application of mathematics in finance.

Secured 12^{th} position at the Asia Regional Finals of ACM-ICPC 2010 (Amritapuri).

Regular participant of TopCoder Algorithm Contests and Kaggle Data Mining Contests.

Won First Prize in F1- Remote Controlled Robot Racing held at inter-hostel level (2009).

Created unique robotic arm design for Robocon selections at Institute level.

Participated in National Sports Organization - Squash during the freshman year (2009-2010).

Won Second Prize at National Level in Classmate Young Author Contest 06 for a science fiction short story, which was judged by author Ruskin Bond and published by Rupa & Co.

Referees

Professor S. Sudarshan
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