

# Anand Soni

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## Education

2011–2015 **Bachelor of Technology, Computer Science and Engineering, IIT Bombay, Mumbai, India.**

GPA: 7.35/10.0

## Professional Experience

- May **Google Summer of Code, Mlpack : A C++ machine learning library.**  
2014–August  
2014
  - Improved the existing automatic benchmarking framework by implementing new performance metrics for various classification algorithms. Implemented one vs. all technique to convert multiclass classifiers into binary classifiers
  - Developed a Bootstrapping framework in Python and d3.js to rank and compare the performance of various other machine learning libraries like Scikit and Matlab with MLPack
- May **Intuit India Product Development Center, Bangalore, India.**  
2014–July  
2014
  - Worked as a part of the Intuit Data Services team for the development of an error analysis and tracking tool for the QuickBooks Desktop care team
  - Developed REST based end points using Jersey and Splunk APIs. Integrated the end points with a user interface developed using AngularJS. Mavenized both the projects for automatic deployment
  - Ideated and developed QUANT (QuickBooks Analytics Tool) for the small businesses to grow based on their current business, customers and competitors data, during Incubation Week at Intuit IDC, Bangalore. Discussed the idea with Scott Cook, Founder, Intuit
  - Offered a full time position (Pre Placement Offer) in recognition of my performance

## Research Experience

- Jul 14–Nov 14 **Undergraduate Thesis - I,**  
*Guide : Prof. Umesh Bellur, CSE, IIT Bombay.*
  - Worked on the experimental comparison of various optimization techniques to minimize the host VM's downtime and the total migration time for live migration
  - Implemented a framework to analyze memory dumps obtained during migration for amount of dirtiness and existence of duplicate pages (full-page, sub-page and chunk-level)
  - Implemented an optimization over the pre-copy approach which uses the merge sort algorithm to sort page groups based on their dirty counts
- Jan 15–Present **Undergraduate Thesis - II,**  
*Guide : Prof. Umesh Bellur, CSE, IIT Bombay.*
  - Worked on the empirical evaluation of Light Weight Containers (LWCs) vs. Virtual Machines (VMs) on the grounds of shared memory usage and under various workloads. The evaluation was done with and without u-KSM enabled in the kernel
  - Currently, working on solving the problem of data center evacuation (VM migration) given a topology and a deadline
  - Implemented a Linear Programming solution to determine the rates at which each VM should be migrated, given the deadline
  - Simulated the migration of Virtual Machines in a given data center topology with each VM migrating through the best available path in terms of network bandwidth

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## Key Academic Projects

- Jan 14–Apr 14 **Simulation of Virtual Memory and File System, Operating Systems Lab,**  
*Guide : Prof. D M Dhamdhere, CSE, IIT Bombay.*
- Simulated the virtual memory organization in C. Implemented the page management and page replacement policies, allocation of physical memory, page tables and page faults
  - Also simulated the basic features of a file system to create, move and delete files and directories
- Jul 13–Nov 13 **FileMesh – Sharing Files over the Network, Computer Networks Lab,**  
*Guide : Prof. Kameshwari Chebrolu, CSE, IIT Bombay.*
- Developed a file sharing system to store and retrieve files to and from multiple servers using sockets
  - Implemented UDP protocol for Store and TCP protocol for Get requests. Stored files as md5sums
- Jul 13–Nov 13 **Travel Planner Webapp, Database and Information Systems Lab,**  
*Guide : Prof. Umesh Bellur, CSE, IIT Bombay.*
- Developed a Java webapp with PostgreSQL database for group and individual tour plannings
  - Worked with a large data of all the cities, states and countries of the world
- Jul 13–Nov 13 **Buffer Overflow Attacks, Computer Architecture Lab,**  
*Guide : Prof. Bernard Menezes, CSE, IIT Bombay.*
- Analyzed program stack on a Linux x86 machine and implemented shell codes to implement a buffer overflow attack executing the `sys_rmdir` system call
  - Studied defence mechanisms against such attacks
- Jul 12–Nov 12 **Data Compression System, Data Structures & Algorithms Lab,**  
*Guide : Prof. Varsha Apte, CSE, IIT Bombay.*
- Implemented the Lempel-Ziv (LZ77) and the Run Length Encoding algorithms to compress files
  - Achieved 45% compression for text, 80% (monochrome) and 50% (colored) compression for images
- Jan 12–Apr 12 **Graphical Application in PLT-Scheme, Abstractions & Paradigms Lab,**  
*Guide : Prof. Amitabha Sanyal, CSE, IIT Bombay.*
- Developed two-player Chess implementing the Object Oriented Paradigm of programming
  - Designed and implemented algorithms for all special moves like Castling and Pawn promotion

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## Awards and Achievements

- IIT JEE, 2011 Qualified in 2011 and ranked among the top 0.2% of the 5,00,000 (approx.) candidates appeared
- AIEEE, 2011 Qualified in 2011 and ranked among the top 0.1% of about 10,50,000 candidates appeared
- Intuit IDC, Bangalore, 2014 Awarded the Intuit Spotlight Award for an exceptional performance during the summer internship
- ACM, US, 2014 Offered student membership and access to the ACM Digital library
- Scholarship Recipient of the IIT Bombay Institute MCM scholarship
- Academics Awarded an AA grade (highest grade) in my first Undergraduate thesis

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## Miscellaneous Work

- Open Source Contributed to Mozilla QA by fixing various bugs and submitting patches. Actively contributing to the Open Source community
- Hackathon Developed a TxtWeb SMS application to get live updates of the FIFA world cup, 2014 during a hackathon organized at Intuit IDC, Bangalore

Seminar Presented a seminar on “Kalman Filters in Robot Localization” to the class as a part of the Artificial Intelligence course, under guidance of Prof. Pushpak Bhattacharya, CSE, IIT Bombay

## Technical Skills

Languages C, C++, Java, Python, Matlab, HTML, CSS  
Technologies MySQL, PostgreSQL,  $\text{\LaTeX}$ , Bash Scripting, Git, Vim, Bootstrap, AngularJS, BeautifulSoup  
Operating Systems Linux, Windows, OS X

## Extra Curricular Activities

Community Work Volunteered as a student organizer and helped in managing logistics for a district level Polio Corrective Surgery Camp organized by the Rotary International  
Literary Arts Served as the Literary Prefect in my senior secondary school for a year. Conceptualized English extempore speaking and writing competitions. Published several articles in school magazine Renaissance  
Techfest, IIT Bombay Worked as a coordinator for the publicity of Techfest, the annual technical festival held at IIT Bombay  
Hobbies Programming, Travelling, Reading, Writing, Running