

# CHIRAG NAGPAL

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## EDUCATION

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<b>University of Pune, India</b> <i>Bachelor of Engineering (Computer Engineering), 6<sup>th</sup> Semester</i> Overall Percentage: <b>81%</b> (WES CGPA: <b>3.9/4</b> ), <b>First</b> Position in Department	2012 - 2016
<b>Delhi Public School, Jaipur</b> <i>CBSE, Class XII</i> (Physics, Chemistry, Mathematics, Multimedia and Web Technology) Percentage: <b>94%</b> , <b>Second</b> Position in Class	2010 - 2012
<b>St. Joseph's Convent School, Pathankot</b> <i>CBSE, Class X</i> (Science, Mathematics and English) GPA: <b>10</b>	2008 - 2010

## SCHOLASTIC ACHIEVEMENTS

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- Robotics Institute Summer Scholarship, 2015 (Awarded to 40 students worldwide to pursue research at CMU)
- IET Scholarship Award, West Zone Winner, 2014 (Awarded to Top 5 students across India)
- Science Academies' Summer Research Fellowship, 2014 at IISc, Bangalore
- Sir Ratan Tata Memorial Scholarship, for standing 1<sup>st</sup> in Computer Department, 2014 & 2013.
- Merit Scholarships by Indian Army for excellence in academics in the years 2014, 2013, 2012 & 2010.
- Selected for INSPIRE, Innovation in Science Pursuit for Inspired Research program, Rajasthan University, 2010.

## INTERNSHIPS AND RESEARCH

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<b>Carnegie Mellon Univeristy</b> <i>Research Intern, Auton Lab, School of Computer Science, CMU</i> · Guide: <b>Prof. Artur Dubrawski</b> , Carnegie Mellon University · Project: <b>'Machine Learning based Entity Resolution to identify Human Trafficking.</b> · Developing an Entity Resolution model using Random Forest Classification to identify sparse edges in online posted escort advertisements. · Identifying connected components using features like Phone Numbers as proxy ground truth for the classifier. · Developing feature extractor for pairs of advertisements from the training set.	July 2015
<b>Carnegie Mellon Univeristy</b> <i>IPTSE Winter School 2014 at NIT Karnataka, Surathkal</i> · Guide: <b>Prof. Bhiksha Raj &amp; Prof. Rita Singh</b> , Carnegie Mellon University · Project: <b>'What impact does an image generate on social media?'</b> . · Applied Kernel Density Estimation to analyse seasonal variation in geo tagged Flickr images. · Worked on ARMA models to predict growth of comments and ads in Flickr. · Carried out sentiment analysis of comments stream using Naive Bayes classifier trained on movie reviews. · Extracted Topical Models from image tags using Latent Dirichlet Allocation.	Dec 2014
<b>Indian Institute of Science, Bangalore</b> <i>Winter Research Intern, Supercomputer Education and Research Center</i> · Guide: <b>Padmashree Prof. N. Balakrishnan</b> , Associate Director, Indian Institute of Science · Project: <b>'Density based clustering of Topically Modelled Microblogs'</b> . · Developed an extension to DBSCAN using a gaussian and sigmoid relation to improve geospatial clustering. · Entire code was parallelized using python multiprocessing and run on a 32 core mainframe with linear scale-up.	Nov 2014
<b>Indian Institute of Science, Bangalore</b> <i>Science Academies' Summer Research Fellow, Supercomputer Education and Research Center</i> · Guide: <b>Padmashree Prof. N. Balakrishnan</b> , Associate Director, Indian Institute of Science · Project: <b>'Application of Machine Learning Techniques for Twitter User Classification'</b> . · Developed Python scripts for Tweet mining using Twitter REST and Streaming API.	May - July 2014

- Utilised NLTK and SciKit to implement algorithms like Decision Trees, Naive Bayes and SVMs on features like discription, followers, friends.
- Presented results to Hon'ble Governor of Andhra Pradesh and Telangana, **Shri. E.S.L Narasimhan**.

## Netaji Subhas Institute of Technology, New Delhi

Dec 2013 - Jan 2014

*Student Mentor, Texas Instruments Centre For Embedded Product Design*

- Guide: **Prof. DV Gadre**, Associate Professor, NSIT, New Delhi
- Mentored undergraduate students from leading universities in India on TI Microcontrollers.
- Trained students on software packages, CadSoft EAGLE and TI Code Composer Studio.
- Guided students with embedded system projects on TI MSP430 and ARM Cortex M4.

## PROJECTS

### Exploring the Language of Likes in Facebook

Sep - Oct 2014

- Developed Python scripts to extract 'likes' from Facebook user profiles and pages using the Graph API.
- Utilised networkx python to generate massive graphs from stored data.
- Utilised Gephi to generate visualisations using OpenOrd, Yifan Hu, Force Atlas etc. algorithms.

### Spatio-Topical Modelling of Tweets from India

Aug - Sep 2014

- Utilised 'R' packages, 'tm' and 'topicmodels' to carry out topical categorisation of a corpus of over 400,000 geo-located tweets by applying Latent Dirichlet Allocation.
- Topic wise visualisations of tweets were generated using package 'mapdata'
- Currently, implementing a fuzzy geographical clustering algorithm based on DBSCAN for topical clustering.

### Wireless Environment Sensing Network with IoT extension

Mar - Apr 2014

*ARM Cortex A8 (BeagleBone Black), MSP430*

- Developed an environment sensing node with LM35, DHT11, LDR interfaced to MSP430 and XBee.
- Coordinator node was developed on ARM A8 based BeagleBone Black serving as an Internet of Things server.
- Frontend was developed as a webpage, served by coordinator using processing.js with backend in Python.
- Work was featured on leading electronics blog, **Hack A Day**, **Dangerous Prototypes**, **Official MSP430 Blog** and stood 1<sup>st</sup> in 'Amalgam' college project competition, 2014

### GPIO Access Through Linux User Space

Nov - Dec 2013

*ARM Cortex A8 (BeagleBone Black)*

- Implemented a novel technique of GPIO access using the Linux mmap() system function and /dev/mem.
- Studied the architecture of the TI AM3359 ARM A8 Controller with special regard to GPIO addressing.
- Achieved a GPIO toggle rate of over 2MHz as compared to the standard 3kHz speed.
- Work was featured on leading electronics blog, **Hack A Day**.

*Complete details of other projects at [www.chiragnagpal.com/projects.html](http://www.chiragnagpal.com/projects.html)*

## TECHNICAL SKILLS

<b>Programming Languages</b>	C/C++, Python, Java, Shell Scripting, R, Latex, Qt, Processing
<b>Platforms</b>	x86, Arduino, MSP430, ARM Cortex M4, ARM Cortex A8
<b>Operating Systems</b>	Unix, Linux, Embedded Linux, Windows
<b>Tools</b>	NLTK, WEKA, EAGLE, Eclipse IDE, Xilinx ISE, GIMP

## PUBLICATIONS

- Reviewed 'Getting Started with Electronic Projects' by Bill Pretty, *PACKT Publishers, UK* ISBN: 9781783554515
- C. Nagpal**, K. Singhal, 'Twitter User Classification Using Ambient Tweet Metadata', Arxiv

## OUTREACH

Have been featured multiple times on leading websites, links below:

- <http://hackaday.com/2014/04/06/hackaday-links-april-6-2014/>
- <http://dangerousprototypes.com/2014/03/31/beaglebone-black-and-msp430-based-wireless-sensing/>
- <http://hackaday.com/2013/12/07/speeding-up-beaglebone-black-gpio-a-thousand-times/>
- <http://dangerousprototypes.com/2013/12/18/laser-pointer-controlled-with-a-pc-mouse/01111>

## AWARDS AND ACHIEVEMENTS

- 1<sup>st</sup> position in ‘Amalgam’, alumni sponsored project competition, AIT Pune, 2014
- Selected for MIT Media Lab DIY Workshop, India, 2014 (could not attend due to University Exams)
- All India Rank 5, ‘National Creativity Aptitude Test’, 2013
- All India Rank 41, National Defence Academy Services Selection Board, 2012 conducted by UPSC.

## **EXTRA CURRICULAR**

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- Founder of the AIT Big Data Initiative, tutored juniors in Web Scraping and Revision Control.
- Student Member, IEEE
- Qualified Amateur Station Operator (HAM Radio) Call Sign VU2CND
- Attended workshop on ‘Creativity and Achievement Motivation’ at IIT, Delhi after qualifying NCAT, 2013.
- Board Member, College Magazine, ‘Srijna’ and Team Member of College Quiz and Debate Club.
- Hobbies include Horse Riding, Swimming, Basketball & Golf.