

# CHIRAG NAGPAL

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## EDUCATION

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<b>University of Pune, India</b> <i>Bachelor of Engineering (Computer Engineering), 5<sup>th</sup> Semester</i> Overall Percentage: 81% , <b>First</b> Position in Department	2012 - 2016
<b>Delhi Public School, Jaipur</b> <i>AISSCE (CBSE, Class XII)</i> Physics, Chemistry, Mathematics, Multimedia and Web Technology Percentage: 94% , <b>Second</b> Position in Class	2010 - 2012
<b>St. Joseph's Convent School, Pathankot</b> <i>AISSE (CBSE, Class X)</i> Science, Mathematics and English GPA: 10	2008 - 2010

## EXPERIENCE

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<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> '.	May - July 2014
<b>Netaji Subhas Institute of Technology, New Delhi</b> <i>Student Mentor, Texas Instruments Centre For Embedded Product Design</i> · 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.	Dec 2013 - Jan 2014

## PROJECTS

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<b>Spatio-Topical Modelling of Tweets from India</b> · 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 visualisation of tweets were generated using package 'mapdata' · Currently, implementing a fuzzy geographical clustering algorithm based on DBSCAN for topical clustering.	Aug - Sep 2014
<b>Extending DBSCAN to Cluster Density Specific Regions</b> · Implemented a modified DBSCAN algorithm in Python with a new input parameter <i>Max Points</i> . · Algorithm was tested on dataset from CHAMELEON. Cluster visualisations generated with Matplotlib	Sep 2014
<b>Application of Machine Learning Techniques for Twitter User Classification</b> <i>Research Project at SERC, Indian Institute of Science</i> · Developed Python scripts for Tweet mining using Twitter REST and Streaming API. · Utilised NLTK and SciKit to train machine learning algorithms like Naive Bayes, Support Vector Machines on features like discription, followers, friends. · Trained classifiers to classify Twitter accounts into Users, Organisations and Celebrities, & Music, Sports and Politics. · Presented results to Hon'ble Governor of Andhra Pradesh and Telangana, <b>Shri. E.S.L Narasimhan</b> .	May - July 2014
<b>Wireless Environment Sensing Network with IoT extension</b> <i>ARM Cortex A8 (BeagleBone Black), MSP430</i> · 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 Intenet of Things server.	Mar - Apr 2014

- 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**.

### **Mobile Camera Robot**

Sep - Oct 2013

*ARM Cortex A8 (BeagleBone Black)*

- Implemented a Web Server using LIGHTTPD and Wi-Fi with static IP on ARM Cortex A8 running Linux.
- Established a 640x480 resolution video stream from a webcam through a simple PHP based web page.
- Interfaced an HMC5883 Magnetometer using I<sup>2</sup>C, and L293DNE Motor Driver for direction & control.

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

## **TECHNICAL SKILLS**

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<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**

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- Currently reviewing ‘*BeagleBone Electronic Projects*’, PACKT Publishers, Birmingham, UK (In Press)
- **C. Nagpal**, K. Singhal, ‘Twitter User Classification Using Ambient Tweet Metadata’, Arxiv

## **OUTREACH**

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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**

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- IET Scholarship Award, West Zone Winner, 2014 (Awarded to Top 5 students across India)
- Selected for Science Academies’ Summer Research Fellowship, 2014 at IISc, Bangalore
- 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)
- 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.
- All India Rank 5, ‘National Creativity Aptitude Test’, 2013
- All India Rank 41, National Defence Academy Services Selection Board, 2012 conducted by UPSC.
- Selected for INSPIRE, Innovation in Science Pursuit for Inspired Research program, Rajasthan University, 2010.

## **EXTRA CURRICULAR**

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- Student Member, IEEE
- Qualified Amature station Operator’s Certificate Exam (HAM Radio)
- Open Source enthusiast and contributed to the Angstrom Linux.
- Attended Workshop on ‘Creativity and Achievement Motivation’ at IIT, Delhi after qulifying NCAT, 2013.
- Board Member, College Magazine, ‘Srijna’ and Team Member of College Quiz and Debate Club.
- Hobbies include Horse Riding, Swimming, Basketball & Trekking.