



**AAKASH ANUJ**

**10CS30043**

**Computer Science and Engineering**

**Indian Institute of Technology, Kharagpur**

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**Objective:** Seeking internship in a fast growing organization so as to hone my technical skills and attaining excellent standards while meeting organizational needs.

## ACADEMIC QUALIFICATIONS

Year	Degree/Certificate	Institute/School, City	CGPA / %
2010-Present	9 <sup>th</sup> semester, Computer Science and Engineering, Dual Degree	Indian Institute Of Technology, Kharagpur	9.26
2010	Class XII Board (CBSE)	D.A.V Public School, Patna	92.2
2008	Class X Board (ICSE)	Don Bosco Academy, Patna	95.8

## SCHOLASTIC ACHIEVEMENTS

- Stood amongst top 1.4% students in the **Joint Entrance Examination**, conducted by Indian Institute of Technology. (2010)
- Recipient of the **Gandhian Young Technological Innovation Award**, having developed a mailing system for the visually impaired people. (2014)
- Qualified for the onsite round and stood amongst top 8% participants in the **ACM-ICPC'14** held at Amritapuri. (2013)
- **Topped** the **world** leaderboard in the coding events **./Execute** and **Cryptoss 2013** organized on Codechef. (2013)
- Achieved **All-India rank 7** in CODECHEF's September Long Challenge. (2014)
- Secured a rank in the **top 2%** of all students at IIT Kharagpur, in 1<sup>st</sup> year. (2011)
- **Winner** of the 24-hour **Google Hackathon** organized by the Google Developer Group, Kolkata. (2013)
- Got into **Microsoft's Finalist's forum**, having developed an *Augment reality shopping* application in a 24-hour Hackathon – **Code.fun.do** (2013)
- Winner of the 24-hour **Hackathon** organized by **Datawind**, India and won a **tablet** for the same. (2013)
- **Winner** of the **Hackathon** organized by the Mozilla, and won a Firefox OS Phone for the same. (2013)
- Awarded **INSPIRE** scholarship in my 1<sup>st</sup> year by the Ministry of Science and Technology, Government of India. (2011)
- Secured **AIR 12** in the final round of the All-India National Cyber Olympiad (**NCO**). (2009)

## TECHNICAL SKILLS

- Programming Languages C, C++, Python, Java, MySQL, HTML, PHP, CSS, Javascript, Ajax
- Libraries OpenMP, OpenCV, MPI(Message Passing Interface), Parallel Patterns Library
- Platform(OS) Android, Windows Phone, Linux, Microsoft Windows
- Software MATLAB, Netbeans IDE, Eclipse, MSVC, Adobe Premiere Pro, Adobe After Effects, Solid Works, Macromedia Flash
- Documentation LaTeX, UML Diagrammer, BOUML

## RELEVANT COURSES UNDERTAKEN / ONGOING

- ALGORITHMS – I & II
- NATURAL LANGUAGE PROCESSING
- ADVANCED GRAPH THEORY
- PROGRAMMING AND DATA STRUCTURES
- ARTIFICIAL INTELLIGENCE
- INFORMATION RETRIEVAL
- SWITCHING CIRCUITS AND LOGIC DESIGN
- IMAGE PROCESSING
- MACHINE LEARNING
- OPERATING SYSTEMS
- SOFTWARE ENGINEERING
- SMARTPHONE COMPUTING AND APPLICATIONS
- COMPILERS
- ALGORITHMS FOR BIOINFORMATICS
- COMPUTER ORGANIZATION AND ARCHITECTURE
- FORMAL LANGUAGES AND AUTOMATA THEORY

## INTERNSHIPS AND RESEARCH PROJECTS

### IMPLEMENTING NEW FEATURES AND ANIMATION DESIGNS FOR FACEBOOK ANDROID NEWSFEED

(May – July 2014)

- **SUMMER INTERNSHIP AT FACEBOOK INC., MENLO PARK, CALIFORNIA**
- Worked on the main Facebook Android application, specifically on News Feed.
- Designed and implemented the architecture to support sounds in the Facebook Android application, for use by new features.
- Designed the architecture and implemented animations for certain elements in the Android News Feed. (Cannot give more details - NDA)

### DEVELOPMENT OF REAL-TIME LOG QUERY AND LOG SUMMARY TOOL

(May-July 2013)

- **SUMMER INTERNSHIP AT ELECTRONIC ARTS (EA GAMES), HYDERABAD**
- Proposed and designed a scalable solution architecture handling several thousand logs per second while consuming low system resources.
- The proposed architecture involved various open source tools, involving Logstash, Beaver, Redis, Elasticsearch, Kibana and Rsync, which were hooked together as a unified product.
- Wrote python scripts for the deployment and maintenance of the tool. Also documented the tool - Design doc, Installation guide and User guide

### GESTURE RECOGNITION USING MACHINE LEARNING FOR HANDS-FREE PRESENTATION CONTROL

(January 2013 –April-2014)

- **B.TECH PROJECT, IIT KHARAGPUR**
- Developing a hands-free PowerPoint presentation system controlled using human gestures and voice.
- Trained and classified gestures using **Hidden Markov models** with adaptive thresholding, adding voice recognition features as well. The proposed system recognized gestures with high precision(better than the Microsoft Gesture Library) to map human gestures to control for PowerPoint.

## DEVELOPMENT OF THE QUILLPAD PREDICTION ENGINE AND ITS GRAPHICAL LAYOUT FOR PORTABLE DEVICES (Nov-December 2012)

- **WINTER INTERNSHIP AT TACHYON TECHNOLOGIES PVT. LTD, BANGALORE**
- Developed the next word prediction algorithm using **CART** (Classification and Regression Tree) and implemented the next key highlighting using the **n-gram** probabilistic model.
- Developed a gesture recognition code using the **Logistic Regression** model to recognize the *matras* in Hindi, supported by the **Regex** model for gesture and letter conjunctions, for displaying the last *akshara* for accepting gestures, etc.
- Developed an entirely new keyboard layout for typing, which also displays the merged CART and **auto-complete** word suggestions.

## ADAPTIVE MESH REFINING USING FULLY THREADED OCTREE AND ITS CONSEQUENT PARALLELIZATION (June –July 2012)

- **SUMMER INTERNSHIP AT ZEUS NUMERIX PVT. LTD, BANGALORE**
- Developed and parallelized a fully threaded tree algorithm using C++. Parallelization was done over shared memory using the library **OpenMP**.
- Used code profilers (GNU gcov, lcov, gprof and Valgrind) for code optimization and to improve performance.

## OPEN SOURCE MAILING SYSTEM FOR THE VISUALLY IMPAIRED (May-Dec 2012)

- **SPONSORED BY SOCIETY FOR NATURAL LANGUAGE AND TECHNOLOGY RESEARCH, KOLKATA AND IIT KHARAGPUR**
- Developed a lightweight application which would enable the blind to use Gmail with ease, both in **JAVA** (Desktop version) and in **ANDROID** (portable version) using **GOOGLE Mail APIs**. Both these applications can easily send voice recordings as attachments over mail.

## ANALYSIS OF DELETED TWEETS IN TWITTER: WHY AND WHICH TWEETS GET DELETED? (March 2014 – April 2014)

- Compared **deleted** and **undeleted** tweets based on their lexical analysis and the topics prevalent in the two classes using the **LDA** technique.
- Found results such as “**How fast** is a tweet deleted?”, “**What kind of tweets** get deleted fast and which ones take longer?”, **gender based cursing** from mentions in the deleted tweets, comparison of topics in the deleted tweets for verified and unverified users, and a geographical analysis of the deleted tweets
- Formed a **network of mentions**, finding **EGO centers** of which gave the potential **spammers**.

## UNDERSTANDING THE CHOREOGRAPHY OF INDIAN CLASSICAL DANCE (August 2014 – Present)

- **M.TECH PROJECT, IIT KHARAGPUR**
- Implemented **beat tracking** in Indian classical music, accompanied by the **extraction of the corresponding frames** in the streams obtained by the Kinect – RGB, Skeletal and the Depth streams.
- Involves training a classifier based on features extracted from these streams **to identify unique dance postures** for a particular *Adavu*, and thereby classifying the complete dance sequence into a sequence of *Adavus*, **and forming a grammar for Choreography using the Adavu labels**.

## CLASSIFICATION OF INDIAN TAALS (August 2014 – Present)

- **DESIGN LABORATORY PROJECT, IIT KHARAGPUR**
- Blind Source Separation was done on a musical play to extract the different instruments playing in the background, and the main focus was laid on the beats of the tabla.
- Audio segmentation was done to extract the repetitive Taals, on which beat tracking was applied to extract the beat timing and the inter-beat intervals.
- Inter-beat intervals were used as features to classify Taals in Indian Classical Music.

## LOCALIZATION AND NAVIGATION USING SEMANTICS (Jan 2012-May 2012)

- **PROJECT SPONSORED BY EUROPEAN AERONAUTIC DEFENCE AND SPACE COMPANY (EADS)**
- Concerned with the testing and debugging of the **SLAM** algorithm to give results as expected. Modified particle weights and **relational trees** to match the features in a segmented image. Became well versed with the **OpenCV** library in the process.

## WEB SCRAPER SCRIPT FOR MINING ECONOMIC DATA (2013)

- **WINTER INTERNSHIP AT CII (CONFEDERATION OF INDIAN INDUSTRY), NEW DELHI**
- Wrote Python scripts to mine economic data from several websites like SEBI, RBI, NSE, BSE, MCX and Yahoo Finance.
- Used *mechanize* for programmatic browsing, submitting forms with data and getting the response, while executing embedded JavaScript code.

## PUBLICATIONS

### VOICE MAIL ARCHITECTURE IN DESKTOP AND MOBILE DEVICES FOR THE BLIND PEOPLE, IHCI 2012 (December 2012)

- Authors: Tirthankar Dasgupta, **Aakash Anuj**, Ritwika Ghose, Manjira Sinha, Anupam Basu

## WORK EXPERIENCE

### DATABASE MANAGEMENT, WEB DESIGN & DEVELOPMENT (2013)

- Developed a mashup using 5 APIs, namely GoogleMap, Twitter, Youtube, Flickr and Travellr to provide all information of a selected place.
- Interface developed using the Mootools JavaScript framework, HTML, PHP, Ajax and CSS, with **MySQL** as the backend database.
- Also included Twitter *trend analysis* of different countries by using **MACD** stock indicator.



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#### FACEBOOK TIMELINE FOR COMPLEX QUERIES

(2013)

- Developed an application to perform complex queries on user's Facebook data obtained from archive, which is not possible by regular Facebook features/options. Also handled privacy settings on select data by a user for another user.
- Examples: A friend's comment on another friend's post, post of a user liked by specific users, post with highest number of likes, etc.

#### PROFILER FOR CRICKETING STYLE AND PERFORMANCE – NATURAL LANGUAGE PROCESSING

(2013)

- Developed an application to rank cricketers based on a specified cricketing style using a **Naïve Bayes classifier**, using a very large corpora obtained from Cricinfo. Training was done with manual annotation. The achieved accuracy of the classifier was **98.76%**.
- The application also found the performance statistics of players for **any customizable time range**, using **Named Entity Recognition** on the corpora.

#### IMAGE PROCESSING

(2012)

- Developed an algorithm in **MATLAB** for **detecting grits** on the surface of soap along with their size and distribution density, and to thereby classify the soap as hard, very hard, smooth or very smooth.

#### ADVANCED IMAGE PROCESSING AND COMPUTER VISION

(2014)

- Implemented algorithms for **panoramic view generation** using homography and **3D scene reconstruction from multiple 2D images** of the same object from different angles and using the same camera.

#### STAY CONNECTED: ANDROID APPLICATION MAKING SURE THAT ONE IS ALWAYS CONNECTED TO THE STRONGEST RSSI / PROXY

(2014)

- Developed an application to automatically switch WiFi to the connection that is having the strongest RSSI at any point of time – poll interval is configurable.
- Analyzed the tradeoff between constantly switching WiFi and power consumption, and also between latency and benefit of constant switching.

#### ILT (INTEGRATED LOAD TEST) REPORT GENERATOR SCRIPT

(2013)

- Modified a shell script to fetch plots from *graphite* servers using *curl* requests and data from *slave* boxes running Blaze tests using SSH.
- Performed a comparison between test and load data using shell script and finally compiled all results into an HTML report.
- Converted the shell script to a Python script using the *paramiko* module to SSH into the *slaves* and extract memory/CPU usage statistics via shell cmds.

#### ROAD REPAIR AND TRACKING SYSTEM (RRTS)

(2012)

- Developed 'Road Repair and Tracking System' software in JAVA, using **JDBC** interface for connecting JAVA programs with **MySQL** database.
- Documented the above software (SRS, SA/SD, UML, Test Suite), which involved using UML case tools.

### POSITIONS OF RESPONSIBILITY

#### CAMPUS AMBASSADOR, FACEBOOK INC.

(2014 - Present)

- Representative for Facebook Inc. at IIT Kharagpur, responsible for organizing events on behalf of Facebook Inc. at IIT Kharagpur.

#### MEMBER OF THE FEEDBACK COMMITTEE, DEPT. OF COMPUTER SCIENCE AND ENGINEERING

(2011 - Present)

- Involved in discussing all matters pertaining to the department both on the **academic front** (conveying students' opinions, giving feedback on the methodology of teaching in various courses and ideas on improving the course structure) as well as **extra-academic** affairs.

### EXTRA-CURRICULAR ACTIVITIES

- Recorded amongst the top 5% users on [www.stackoverflow.com](http://www.stackoverflow.com) for 2 consecutive years. (2012-13)
- Organized a 2 day **workshop** on Android App Development at IIT Kharagpur, witnessing participation of over 100 students all across India. (2013)
- Member of the **Web Design Team** of Entrepreneurship Cell, IIT Kharagpur. (2010-11)
- Won the 1st prize in **MindSport** (analytical & mathematical skill game), 2<sup>nd</sup> prize in **Relic Hunter** (an online treasure hunt) and 3<sup>rd</sup> prize in **Excalibur** (an online business quiz) organized by Kshitij (techno-management fest of IIT Kharagpur) (2013)
- Winner** of the code debugging event "Segmentation Fault", organized by IIIT Allahabad. (2013)
- A mentor chosen by the **Student Mentor Programme**, IIT Kharagpur with the aim of encouraging productive interaction and providing effective guidance to juniors. (2012-present)