Vaibhav Nagar | Senior Undergraduate

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Education

B.Tech., Computer Science And Engineering **9.1/10.0**
Indian Institute of Technology Kanpur *2014-present*

AISSCE, Class XII CBSE Board **95.6%**
Ramakrishna Vidya Mandir, Gwalior *2014*

AISSE, Class X CBSE Board **10.0/10.0**
Venus Public School, Gwalior *2012*

Scholastic Achievements

- Received **Academic Excellence Award (IIT Kanpur)** for outstanding academic performance in the academic term **2014-15**
- Secured **All India Rank 486** (amongst around 1.5 lakhs candidates) in **IIT-JEE (Advanced) 2014**
- Secured **All India Rank 926** (amongst over 14 lakhs candidates) and **State Rank 15** with **All India Percentile Score-99.93** in **JEE (Mains) 2014**
- Awarded **KVPY** (Kishore Vaigyanic Protsahan Yojana) **2014 scholarship** and secured **All India Rank 466** after getting selected in both written exam and interview
- Awarded **Inspire Scholarship** by virtue of performance within **top 1%** of Senior School Certificate Examination 2014
- Secured **All India Rank 355** (amongst around 1,93,000 candidates) in **VITEEE 2014**

Internships

Adobe Systems, Bangalore, India *May'17 - July'17*

- Research internship in a team of two on the project Multi-Task Learning on web analytics data under the supervision of Senior Research Scientists (Adobe Research)- Shiv Kumar Saini and Vishwa Vinay
- Implemented various multi-task learning models to test the hypothesis that jointly building related models is more effective than doing them independently
- Exploited the creation of a representation that is common across tasks using mutli-task learning as a customer profile for lookalike modeling and clustering

Monet Networks Inc, Gurgaon, India *May'16 - July'16*

- Worked as Software Developer to implement various features to enhance Monet's non-verbal cues (NVCs) analytic platform which provides a way to capture, track and analyze video content in real-time and allows users to find and rate different brands' content
- Developed a feature of analyzing text to get emotions out of it using a tone analyzer api and to detect gibberish texts, a model of character to character transitions from bunch of English text based on Markov's chain
- Created a portal to add campaigns of videos, images and texts through backend and frontend and integrated it with Wowza streaming engine and Webcam-js to capture snapshots in real time based on flash in browser

Projects

Active Transfer Learning **Ongoing*
Course project for CS772- Probabilistic Machine Learning under Prof. Piyush Rai

- Implemented the approach of combining Active Learning and Transfer Learning as described in "Active Learning with Cross-Class Similarity Transfer" on CIFAR-10 image dataset
- Used similarity propagation method on class-class and sample-sample similarity graph based random walk for information propagation and augment the labeled set by selecting samples for expert labeling using Uncertainty Sampling

Securing Zoobar Web-Application *Jan'17 - Apr'17*
Course projects for CS628- Computer Systems Security under Prof. Sandeep Shukla

- Exploited system security vulnerabilities in zoobar web application using buffer overflow, code injection, return-to-libc attack and browser-based attacks like cross-site request forgery, XSS scripting, side channels and phishing, profile worm and password theft
- Improved zoobar web server and its services using privilege separation and server-side sandboxing

C++ Compiler *Jan'17 - Apr'17*

Course project for CS335- Compiler Design under Prof. Amey Karkare

- Implemented an end-to-end compiler for C++, written in Python, which generates code in the MIPS architecture
- Compiler supports various features- native data types, variables and expressions, control structures, conditionals, loops, output statements, arrays, functions, recursion, pointers

Research Catalogue *Jan'17 - Apr'17*

Course project for CS315- Principles of Database Systems under Prof. Medha Atre

- Designed a web application using MySQL database which is stored as InnoDB storage engine to create an easily maintainable and flexible bibliographic database of research papers
- Optimized SQL queries by creating indexes after selecting the most frequently used query and creating its plan tree

Computer Network Projects *Aug'16 - Nov'16*

Course projects for CS425- Computer Networks under Prof. Sandeep Shukla

- Built a concurrent HTTP Server with hyperlinked directory feature and concurrent HTTP proxy server using socket programming
- Implemented an STCP (Simple-TCP) transport layer which provides a connection-oriented, in-order, full duplex end-to-end delivery mechanism and implemented an internet router to handle ARP, ICMP echo requests and TCP/UDP packets with proper error handling

NachOS *Aug'16 - Nov'16*

Course project for CS330- Operating Systems under Prof. Mainak Chaudhuri

- Extended the NachOS operating system to perform various system calls such as Fork, Join, Exec, Sleep and Exit
- Implemented various scheduling algorithms like UNIX scheduler, FIFO, round robin and non-preemptive with burst estimation and evaluated their performance and implemented shared memory and demand paging algorithms

Real-Time Polling *Aug'16 - Nov'16*

Course project for CS252- Computing Laboratory under Prof. Piyush Kurur, Satyadev Nandakumar

- Created a web application which provides an interface for conducting polls and displaying the results in real time
- Built using Django framework integrated with PostgreSQL for database management
- Established persistent connection between the server and clients using websockets and asyncio

Gyro-stabilized Plane *May'15- Jun'15*

Summer Project under Aero-modelling Club

- Objective was to make a composite RC plane embedded with Arduino (micro-processor), which is stable even in high wind speed and used for maneuvering purposes
- Developed a code written in Arduino IDE using PID (proportional-integral-derivative) controller feedback mechanism to find error in all three axes using accelerometer and gyro-meter and then rectified which directly controls main components

Technical Skills Set

Programming C, C++, Python, Shell, GNU Octave, LaTeX, Java(basics), Verilog, Assembly(x86)

Web-Dev HTML, CSS, JavaScript, Jquery, PHP, SQL

Platforms/ Tools Windows, Linux, Tensorflow, Keras, PyTorch, Vim, Git, GNUPlot, SQLite, Android Studio

Relevant Courses

- Probabilistic Machine Learning‡
- Visual Recognition‡
- Topics in Computer Vision
- Algorithms -II
- Data Structures and Algorithms
- Computer Systems Security
- Computer Networks
- Machine Learning (Coursera)
- Compiler Design
- Operating Systems
- Principles of Database Systems
- Computing Laboratory-I, II
- Computer Organization
- Fundamentals of Computing
- Theory of Computation
- Applied Stochastic Processes ‡
- Complex Variables‡
- Probability and Statistics
- Discrete Mathematics
- Mathematical Logic
- Abstract Algebra
- Linear Algebra and ODE

‡ : *Ongoing Courses*

Extra Curriculars

- Worked in Alumni Contact Program, IIT Kanpur, for four months as a Junior Executive to ensure strengthening of the Alumni Network of the institute and gained experience by working in office like environment
- Participated in **Code.Fun.Do 2015 (Microsoft)**, a 24 hours long appathon and certified for completion
- Certified for exemplary performance in NCC (National Cadet Corps) and become a bonafide cadet in the first year