Viveka Kulharia

4th Year Undergrad ,CSE
IIT Kanpur

+91-868-736-1182
Address: G317/9, IIT K

vivkul@iitk.ac.in
vivkul.github.io/

Examination	University	Institute	Year	CPI/%
Graduation	IIT Kanpur	IIT Kanpur	2012-2016 (7 sem)	9.1/10
Intermediate (+2)	CBSE	Sunrise Modern School, Hisar	2011	85.4%
Matriculation	CBSE	Kendriya Vidyalaya, Hisar	2009	88.4%

SCHOLASTIC ACHIEVEMENTS

- **Academic Excellence** Award for the academic year 2012-13 (awarded to top 7% students of the batch) (2014)
- **AIR 254**, **IITJEE** among 5.6 lakh students. (2012)
- Secured **AIR 330**, **ISAT** among 1.1 lakh students. (2012)
- Secured **AIR 1**, **KVS Junior Mathematics Olympiad** and selected for 11th Maths Olympiad INMO Prep. Camp at KV, Mankhurd. (2008)

INTERNSHIP

Interned at **Xerox Research Center India**, Bangalore (www.xrci.xerox.com) (May-July'15)

1. Explored lasso to get interpretable Sparse model for a high feature dataset
2. Created a **novel method** to estimate missing values under constraint
3. Got **pre-placement offer** for the work done

Internship at **Monet Networks Inc.** (http://www.monetchannel.com/) with a team of 4 students with following projects: (May-July' 14)

1. Understanding of the existing Facial Expression Recognition API and its usage using standard **POST/REST protocols**
2. To create a webpage to capture and store video using existing **WebRTC APIs** and develop proper front-end and back-end, controlled using GIT.
3. Understanding Monet Networks Inc.'s proprietary platform and to be able to make changes on its **Non Verbal Cue analytics**.
4. Developing specific metrics on non-verbal cue analytics for **content rating** based on Monet's existing platform
5. Integrating the **development metrics** and associated **presentation charts** into existing Monet code.

COURSE PROJECTS

Under Graduate Project under the guidance of Prof Harish Karnick: (Aug-Nov'15)
Documentation: http://www.cse.iitk.ac.in/users/dugc/15reports/vivkul.pdf

1. Worked on matrix completion using **Alternating Least Squares** (ALS) on Netflix dataset
2. Studied the theoretical bounds on ALS and its implementation in Matlab, Hadoop and Spark
3. Implemented the **parallelization** of AltMinComplete algorithm in Spark

Worked in a team of 2 to analyze the usage of **Kernel for Graph Similarity**: (Aug-Nov'15)
Documentation: https://github.com/vivkul/Graph-kernels

1. Explored ways of **efficiently finding similarity** between graphs using graph kernels
2. Implemented and compared the running times of **Shortest Path Kernels** and **Random Walk Kernels** on chemical molecules and protein graphs

Worked in a team of 3 to develop an **Oz** (functional language) **interpreter**: (Aug-Nov'15)
Documentation: https://bitbucket.org/ghosh_arnab/popl/src

1. **Declarative sequential model** included features such as variable binding, records, pattern recognition, conditionals, procedures and recursion.
2. Declarative sequential model was extended to deal with **concurrency** with feature of **Threads**

Worked in a team of 4 to do **Sentiment Analysis** of Movie Reviews: (Jan-April'15)
Documentation: https://gitlab.com/vivkul/sentimentanalysis_word2vec

1. Worked on **various methods** for sentiment analysis of movie reviews using Kaggle dataset.
2. Compared **various techniques** of text preprocessing, feature extraction, feature selection and classification.

Worked in a team of 2 students on "Semantic Compositionality through Recursive Matrix-Vector Spaces" (Jan-April'15)
Documentation: http://cse.iitk.ac.in/users/cs365/2015/_submissions/vivkul/report.pdf

1. Worked on **Richard Socher's** thesis which uses **Recursive Neural Networks (RNN)** to get the **semantic relation** between nominal of a sentence.
2. Studied the **related works** in the field and analyzed the effectiveness of RNN in the task.
3. Model learnt on SemEval 2010 Task 8 was tested for **domain adaptation** on another dataset: SemEval 2007 Task 4.

Worked in a team of 3 to develop an end-to-end **Java Compiler** (Jan – Apr'15)
Documentation: https://gitlab.com/sara_polyn/cs335-course-project

1. Implemented a compiler for a subset of **Java to MIPS** in C++
2. Supports loops, expressions, type checking, primitive datatypes, 1D arrays and **recursion**

Worked in a team of 6 students to develop course review website in **nodejs** with following features (Aug-Nov'14)
Documentation: https://git.cse.iitk.ac.in/cs252/rate-course/tree/master

1. Each offering of Courses can be rated and commented upon, students can **fix meeting** with the professors.
2. **Course Recommendation** for each user based on course ratings using **Machine Learning**.
3. **Automatic grading** for every student in a course given their marks to ease the job of professors.

Worked in a team of 3 students to extend NachOS Operating Systems, to study the behavior of **operating system** as part of course (Aug-Nov'14)
Documentation: https://gitlab.com/pranavmane/nachosassignment2

1. Implemented system calls pertaining to Fork, Exec, Join, Yield, Sleep and Exit
2. Implemented UNIX, First in First Out, Round Robin, Shortest Job First and Non-Preemptive **job scheduling algorithms**
3. Implemented Random, First in First Out, Least Recently Used (LRU) and LRU Clock **Page replacement algorithms**

OTHER PROJECTS

Worked in a team of 3 students to develop **NLP based app**: "I think" during **Yahoo! HackU** , **24 hr** App development competition (Aug'13)
Web- http://hacks.developer.yahoo.com/hack/iit-kanpur-hacku-2013/i-think/event_14/hack_864

1. **Question-answering platform** was developed using **CodeIgniter** where students can login to ask questions and profs to conduct survey.
2. Spamming of similar questions was avoided by **nltk, a python library** using questions already present in database.

Worked in a team of 7 students to develop a **Kinect controlled bot** with 4-R manipulator arm that could move in 3-d terrain. (May-June'13)
Documentation: http://students.iitk.ac.in/projects/roboticsclub_kinect_3dmotion?rev=1375810978

1. Built the bot using ceramic sheet, arm with acrylic sheet, wheels aligned and attached to motors, fixed Microcontrollers, ICs, and **Zigbee**.
2. **ATmega32** was programmed to control the arm and bot motion according to the input from laptop.
3. **Inverse Kinematics** was done using C++ to instruct the bot to move arm or reach the target using the positions calculated.

Worked in a team of 3 students to develop **Programming Club website** having **forum**, **user profile** and Automated Scheduler. (May-June'13)
Documentation: https://github.com/vivkul/pclub

1. The forum has the capabilities of **like/dislike** or report statements with reason. It was made from scratch using **CodeIgniter**.
2. **Canvas** was used as a CSS framework and database was managed using **MySQL**. Code version was controlled using **GIT**.

ONGOING PROJECTS

Working in a team of 2 for Under Graduate Project under the guidance of Prof Amitabha Mukerjee: (Jan-Apr'16)

1. Working on **solving Non-verbal reasoning Series questions** using Deep Learning models

Working in a team of 2 to insert new modules in the framework "**vowpal wabbit**" (Jan-Apr'16)

1. Will be adding the latest **online learning algorithms** to the framework

Working in a team of 3 to **solve jigsaw puzzle** (Jan-Apr'16)

1. Will be using **Deep learning models**

CONFERENCES AND WORKSHOPS

- Among the 5 IIT Kanpur students selected for NUS Workshop on Contemporary Research in Computer Science and Information Systems 2016, Singapore, held on Jan 26-28, 2016.
- Invited to "Xerox Open 2016", Bangalore, held on Jan 21-22, 2016.

SKILLS

- Languages: C, C++, Python, Perl, C# , Bash (Shell Scripting), Bluespec Verilog, Assembly(MIPS ISA), R, Matlab, mongoDB, Mozart
- Web Development: PHP, HTML5, Javascript, JQuery, CSS, MySQL, Smarty, SQL
- Frameworks: CodeIgniter, Foundation, Bootstrap
- Other: LaTeX, Beamer, GNU Plot, Octave, Git, WebRTC, Recorderjs, nvd3 graphs, Vim, Autodesk Inventor, JSON, XML

MISCELLANEOUS

- Do algorithmic coding on different programming websites like codechef, codeforces, topcoder with **handle: vivkul**.
- Got **13th position** out of 702 registered teams with team name- DeltaStars in OPC-Pravega, 2015 conducted by Codechef.com. (Jan '15)
- Worked on LED, Oscillator, I/O, Timer and Non-Timer, UART, Interrupt, DMA and ECAN using **Microchip controller** dsPIC33FJ256GP710 for Lohia Corp Ltd., Kanpur (Dec' 14)
- Developed **Monopoly strategy game** for windows 8 pc in **code.fun.do, Microsoft Appathon** with a team of 4 students. (Mar'13)
- Got Yellow Belt in Taekwondo, IIT Kanpur. (Feb '13)
- Got 2nd Place, Basketball**,** overall among all 1st year students organized by CPA, IIT Kanpur. (Oct '12)

POSITIONS OF RESPONSIBILITY

- **Mentor**, CS771 course : **Machine Learning**: Tools, techniques, applications (Jan'16 – Apr'16)
  - Helping set assignment and exam problems and post their solutions in the course of around **200 students** under the guidance of Prof. Harish Karnick.
- **Teaching Assistant**, ESO207 course : Data Structure and Algorithms (July'15 – Nov'15)
  - Helped set problems, grade assignments and exams, post their solutions, invigilate exams and set doubt remedy hours along with 10 other TAs in the course of around **300 students** under the guidance of Prof. Shashank K Mehta.
- Secretary, Association of Computing Activities, IIT Kanpur (May'13 – July'14)
  - Created its **website** which includes the schedule and description of upcoming events: http://www.cse.iitk.ac.in/users/aca/
  - Working with a team of 11 to **conduct events** like fresher's night, Microsoft code.fun.do, Yahoo! HackU.
- Mentor, PClub Summer Project (May'14 – Jun'14)
  - Mentored a team of 4 students to develop Programming Club website and helped them learn how to code a big project.
  - Introduced them to web-programming using php framework codeigniter and Bootstrap as CSS framework
- Mentor, ESC101 course (Jan'14 – Apr'14)
  - **Mentored** 6 students in Esc101 course that deals with programming in C under the guidance of Prof. Raghunath Tewari.
- Volunteer, Synchronicity, Antaragni 12 (Aug'12 – Oct'12)
  - Advertised the event, marketed Synchronicity Products including T-shirts, sweat-shirts and CDs.
  - Coordinated with bands in their stay and for timely occurrence of event, managed the audience