Nishant Rai

E-mail: nishantr@iitk.ac.in   Phone: +91-8604293406

Education

April 2017	B.Tech (Computer Science And Engineering)	IIT Kanpur	— 9.9/10.0
April 2013	Class XII (Central Board for Senior Education)	K.V. Delhi	— 96.20 %
April 2011	Class X (Central Board for Senior Education)	K.V. Shillong	— 10.0/10.0

Academic Achievements

Received Charpak Research Scholarship for the year 2015.
Received the Academic Excellence Award for exceptional academic performance in the 13-14 academic session.
Secured AIR - 257 in JEE (Advanced) 2013 and AIR - 79 in JEE (Mains) 2013.
One amongst the 6 INMO Awardees selected for IMO training camp, after clearing INMO '13.
Awarded Gold medal for being amongst the 30 students selected for IPhO training camp, after clearing INPhO '13.
Awarded Ashray Hasta Award and Scholarship, 2013 for exceptional performance in AISSCE, 2013.
Selected for the prestigious KVPY scholarship, in stream SX.
Secured Rank 1 in Regional Mathematics Olympiad '12 (Delhi Region).

Achievements in Programming

Secured 1ST place in Microsoft CodeHunt amongst individuals from all over the country. Selected for the finals in China.
Secured 13TH place in the event IOPC (International Online Programming Contest) held during Techkriti '15.
Secured 1ST place in the event Chaos held during Techkriti '15
Acheived maximum points in Morgan Stanley Codeathon 2014 and secured 17TH place amongst 1000+ individuals from over the country.
Secured 26TH place in ACM ICPC Onsite Contest (Amritapuri Region) 2014 amongst 250+ teams from over the country.
Secured 1ST place in the Web-dev event during Takneek '14 (Inter-Hostel Technical Competition).
Secured 1ST place in the programming event Blackbox during Takneek '13 (Inter-Hostel Technical Competition).
Secured 1ST place in FPC - 3 and 2ND place in FPC - 2 organised by Programming Club.

Internships

I.N.R.I.A.   Research Internship
The French Institute for Research in Computer Science and Automation   May '15 - Jul '15

Alternate Paths in Road networks:
Mentored by Laurent Viennot, Senior Researcher, INRIA and Adrian Kosowski, Researcher, INRIA, for finding routes substantially different from the shortest path based on different criteria.

- Implemented various shortest path algorithms and compared their efficiency on real world road networks.
- Proposed algorithms to compute paths according to other definition.
- Created measures to compare different algoirthms developed efficient algorithms for the involved computations.
- Algorithms Involved: Dijkstra search, Floyd Warshall algorithm, A* search, Bidirectional Search, Landmark based search, Reach based pruning, Contraction hierarchies, K shortest Paths and Alternate Graphs.

Feature Based Representation of Social Networks:
Mentored by Adrian Kosowski, Researcher, INRIA with an aim to good local features which can act as suitable predictors for the graph's global features.

- Studied information spread models and maximising it, Local Ranking problem, Pagerank algorithm.
- Implemented and studied randomised rumor spreading, the relation between size and steps for spread of the rumor
- Studied and explored different local features in graphs based on walks, subgraph densities, centrality measures and their relation with other global properties along with arguments to explain the obtained results.
- Topics involved: Information Spread In Networks, Maximizing Informaition spread (using Initial Partial Incentives), PageRank Algorithm, Similarity of graphs/nodes, Local ranking problem, Randomised Rumor spreading and Models of information spread.

Projects

Emotion Recognition using a Triad based approach: May '14 - Jun '14
- Project aimed at improving emotion detection accuracy using three features i.e. textual, speech and visual. Developed emotion detectors which use text, video and audio as features.
- Merged the results of the three classifiers to identify emotions accurately.

- TECHNIQUES USED: SUPPORT VECTOR MACHINES, NEURAL NETWORKS, RANDOMISED FOREST CLASSIFIERS, DECISION TREES, K NEAREST NEIGHBOURS, HIDDEN MARKOV MODELS, IMAGE NORMALISATION, NOISE REDUCTION, PRINCIPAL COMPONENT ANALYSIS and POS TAGGING.
- Learnt about FACIAL ACTION CODING SYSTEM, ACTIVE SHAPE/APPEARANCE MODELS and other prevalent methods of emotion classification.

GEOMETRIC DATA STRUCTURES: Sep '14 - Nov '14

- Project for ADVANCED TRACK in course CS210: Data Structures and Algorithms, under Prof. Surendar Baswana.
- Project involved re-invention of several geometric data structures to efficiently answer specified queries.
- QUERIES HANDLED: POINT IN POLYGON, CONVEX HULL, POLYGON-LINE INTERSECTION, SIMPLEX PROBLEM and HALF PLANE PROBLEM.

NEWS REPORT CLASSIFICATION: Jan '14 - Apr '14

- Project aimed at classifying news articles into categories, implemented K Nearest Neighbours and automated scraping of online news articles.
- TECHNIQUES USED (NLP): TOKENISATION, LEMMATISATION, TFID, STOPWORD REMOVAL and BERNOULLI MODELS.
- TECHNIQUES USED (ML): SUPPORT VECTOR MACHINES, NAIVE BAYES CLASSIFIER, K-NEAREST NEIGHBOURS and NEURAL NETWORKS

SENTIMENT ANALYSIS OF SOCIAL MEDIA: Aug' 14

- Application developed during WEB-DEV, TAKNEEK '14 and secured FIRST position.
- Interface to analyse the past and present social sentiment of brands and their products, identify "good" and "bad" features of the product.

MECHANICAL OBJECT ELEVATOR: Aug '14 - Nov '14

- Awarded BEST SECTIONAL PROJECT in course TA201: Manufacturing Processes - I.
- Demonstrated the use of CAM Mechanism in elevating any object using periodic rotational motion.

OTHER MINOR PROJECTS:

- Implemented a CAPTCHA DECODER, able to work with some level of noise.
- Created models for predicting search trends, guessing topic based on keywords and some other problems.
- Completed project to discover patterns and trends about the New York Subway, under the Udacity course: INTRO TO DATA SCIENCE.

POSITIONS OF RESPONSIBILITY

Jan '15 - Current	**MEMBER, CORE TEAM ACADEMICS, COUNSELLING SERVICE** Responsible for scheduling and managing remedial lectures, mentor allotment and other academics related issues. Assisting peer students in departmental courses by conducting classes as well as personal tutoring.
Aug '14 - Mar '15	**SENIOR EXECUTIVE, PUBLIC RELATIONS, TECHKRITI '15, IIT KANPUR** Contacting eminent personalities like Nobel Laureates, Ted Speakers and CEOs to participate in the festival Responsible for inviting eminent personalities, professionals for Talks, Shows and Exhibitions Looking after their publicity, travel arrangements and hospitality.
Apr '14 - Apr '15	**SECRETARY, PROGRAMMING CLUB** Worked with the Programming Club to introduce the batch of 2018 to programming and help improve the programming culture on campus. Responsible for conducting introductory lectures and competitions related to programming. Developed content and helped organise programming contests attended by over 1500+ teams.
Jun '14 - Apr '15	**ACADEMIC MENTOR (MTH101/102), COUNSELLING SERVICE** Mentored academically weaker students to cope up with their academics. Conducted Hall level and institute level remedial classes.
Jun '14 - Apr '15	**STUDENT GUIDE, COUNSELLING SERVICE** Managed responsibility of seven freshmen, helped and guided them to get acclimatized to the institute Supervised registration and orientation of more than 800 students assisted by other Student Guides
Previous	**SECRETARY, HOSPITALITY CELL, UDGHOSH '14** **VOLUNTEER, HOSPITALITY CELL, UDGHOSH '13**

Technical Skills

Programming Languages: C, C++, Python, HTML5, Java, JavaScript
Software and Utilities: MATLAB, GNU Octave, Git, LaTeX, AUTOCAD Inventor

Extra-Curricular Activities

Secured 1ST place in Reviews - Lifestyle event in Spectrum '14 (Inter-Hostel Competition).
Secured 1ST place in Tennis (Singles) in Freshers' Inferno '13 (Inter-Hostel Sports Competition).
Selected for participation in CBSE Tennis Regionals (Guwahati Region), 2009.
Selected for participation in Inter School Table-Tennis Tournament, Shillong in 2010.
Secured 1ST place in a Tennis Tournament held at Basava International School, New Delhi in 2011.