Nitish Gupta
Senior Undergraduate Student

Department of Electrical Engineering
Indian Institute of Technology, Kanpur

CONTACT INFORMATION

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ACADEMIC INTERESTS

Machine Learning, Artificial Intelligence, Data Mining, Algorithm Development, Mathematical Statistics, Computational Finance

EDUCATION

Indian Institute of Technology, Kanpur, India
B.Tech. - M.Tech Dual Degree, Electrical Engineering July 2010 to present
- *CGPA* 9.0/10 (3.6/4.0) after a period of 6 semesters

Delhi Public School, Kalyanpur, Kanpur, India
A.I.S.S.C.E. (12^{th} Class), Central Board of Secodary Education May 2010
- *Scored an aggregate of* 93.2/100

Delhi Public School, Kalyanpur, Kanpur, India
C.B.S.E (10^{th} Class), May 2008
- *Scored an aggregate of* 95.00/100

ACADEMIC ACHEIVEMENTS

- Secured **All India Rank 510** in IIT Joint Entrance Examination (2010) out of around 0.5 million candidates(99.9 Percentile) who appeared for the competitive exam.
- Secured **All India Rank 484** in All India Engineering Entrance Examination (AIEEE 2010) out of around 1.1 million candidates(99.95 Percentile) who took the test.
- Secured **All India Rank 132** in National Science Olympiad for the year 2010.
- **CBSE Merit Certificate, 2008** for being among the top 0.01% scorers in Science.
- **CBSE Merit Scholarship, 2010** for professional studies.

RESEARCH EXPERIENCE

- *Ultrasound Research Group* May - July 2013
  Philips Electronics India Limited, Bangalore
  Summer Intern
  Mentor : **Srinivas Kudavelly**
  Automatic Breast Lesion Segmentation and Scoring in Color Elastography Images
  Designed a real time algorithm to identify, segment and classify breast lesions in Color Elastography Ultrasound Images. Study and extraction of useful features for detecting the relative elasticity and stiffness of tissues for automatically classifying the tumor into different grades based on Breast Lesion Scoring system was also done. The algorithm was tested against hand segmented and annotated images by specialist doctors and more than 92% overlap was observed. The implementation was done in C++ using the OpenCV library.
  Report: http://home.iitk.ac.in/~gnitish/docs/philips.pdf

- *Algrorithms and Complexity Group* May - July 2012
  Max Planck Institute for Informatics, Saarbrucken, Germany
  Summer Intern
  Mentor : **Prof. Kurt Mehlhorn**
  Multiterminal Cut in Weighted Graphs
  Studied various graph algorithms and implemented the NP-Hard Combinatorial Algorithm to find the minimum weight cut to separate all terminals from a given graph. The notion of "Important Separators" was realized and we wrote an algorithm for finding the separators. The code was then checked for over 1000 randomized graphs and gadget graphs specially designed for such problems. The implementation was done using *LEDA*, a C++ class library of efficient graph and network data types and algorithms.
  Report: http://home.iitk.ac.in/~gnitish/docs/MWC.pdf

- *Computer Vision Lab* March - April 2013
  Mentor : **Prof. Amitabha Mukherjee**
  Subtle Facial Expression Recognition using Motion Magnification
  Built a system to magnify subtle facial expressions to exaggerate them. This helps in recognition and easy classification of various subtle expressions that are otherwise unnoticeable to the naked eye. The algorithm made of use of Active Appearance Model Fitting and Eulerian Motion Magnification to magnify the expressions. A Multiclass SVM classifier was also built to classify the magnified expressions into different categories. The implementation was done in MATLAB.
  Report: http://home.iitk.ac.in/~gnitish/docs/expression_recognition.pdf

- *Machine Learning* Sept 2013 - Ongoing
  Mentor : **Prof. Harish Karnick**
  Movie Rating Prediction System using Content-Boosted Collaborative Filtering
  The project aims at using the Movielens data set to create a movie rating prediction system which will predict whether a user will watch a given movie or not and if yes, the system will also predict the rating the user is likely to give. We aim at clustering similar users together, building a Bayesian Classifier to predict ratings for movies not watched by users and using Content Boosted Collaborative Filtering to predict ratings for a new user.

- *Natural Language Processing* Sept 2013 - Ongoing
  Mentor : **Prof. Amitabha Mukherjee**
  Product Feature Discovery and Ranking for Sentiment Analysis using Online Reviews
  The projects aims to apply opinion mining to extract features of an entity from public opinions in a fully unsupervised manner. The second part of this project will apply feature ranking on the extracted feature candidates to find the most relevant feaures from all opinions. Sentiment Analysis will also be done on the opinions based on the extracted features and their polarity for a particular person.

Technical Skills

- **Programming Languages**: C/C++, Java, Python, HTML, CSS
- **Data Mining**: Weka, R
- **Specific Softwares**: OpenCV, LEDA, QSTK, Matlab, Octave
- **Operating Systems**: Windows, Linux

Positions of Responsibilty

- **Senator**, Students Senate, IIT Kanpur (2013 - Present).
- **Overall Coordinator**, Synchronicity '12, Annual Rock Festival, Antaragni '12, IIT Kanpur.
- **Overall Coordinator**, Freshers Night '11, cultutral night conducted to welcome the fresher's batch of 2011, IIT Kanpur.
- **Guitarist** and **Vocalist** in the Music Club, IIT Kanpur.

Relevant Coursework

Computer Science Courses	Electrical Engineering Courses	Other Courses
Machine Learning -Tools & Techniques	Speech Signal Processing	Probability and Statistics
Artificial Intelligence Programming	Digital Signal Processing	Computational Investing (Coursera)
Natural Language Processing	Digital Communication Networks	Applied Game Theory
Data Structures and Algorithms	Communication Systems	Complex Analysis & Linear Algebra
Introduction to Scientific Computing	Principles of Communication	Real Analysis & Calculus

References

Prof. Kurt Mehlhorn [mehlhorn@mpi-inf.mpg.de]
- Algorithms and Complexity Group
  Max Planck Institute for Informatics, Saarbrucken, Germany

Srinivas Kudavelly [srinivas.kudavelly@philips.com]
- Ultrasound Research Group
  Philips Healthcare, Bangalore

Prof. Amitabha Mukerjee [amit@cse.iitk.ac.in]
- Dept. of Computer Science and Engineering
  IIT Kanpur