Pranav Maneriker

Contact Information

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Research Interests

Probabilistic models, kernel methods, deep learning, parallelization (GPU), data compression, computer vision, security, cryptology, game theory and approximation algorithms

Education

Indian Institute of Technology Kanpur
B.Tech in Computer Science and Engineering **(2012 – 2016)**

- Cumulative Performance Index (CPI) of **9.2** (on a scale of 10) after 8 semesters

All India Senior School Certificate Examination, CBSE India **(2012)**

- Scored cumulative **97.0%** marks in Senior Secondary School

All India Secondary School Examination, CBSE India **(2010)**

- Scored a CGPA of **10.0** in High School (on a scale of 10)

Honours and Awards

- Selected for **Aditya Birla Scholarship** 2012-2016 (awarded to 15 students from all IITs and BITS Pilani) by Aditya Birla Group
- Award for **Academic Excellence** 2012-2013, IIT Kanpur (awarded to top 7% of the batch)
- Awarded **Kishore Vaigyanik Protsahan Yojna** fellowship, 2010 (236 fellows were selected) by Indian Institute of Science,Bangalore

Scholastic Achievements

- Secured an All India rank of **145** in **Joint Entrance Examination**, 2012 conducted by Indian Institute of Technology (Taken by nearly 5 lakh students)
- Secured an All India rank of **39** in AIEEE-2012 among 1.2 million students
- Qualified and secured **22nd** position in **ACM ICPC** (International Collegiate Programming Contest) **Kharagpur Regionals, 2013** (as a part of team MemoryOverflow)
- Qualified and secured **22nd** position in **ACM ICPC** (International Collegiate Programming Contest) **Amritapuri Regionals, 2014** (as a part of team MemoryOverflow)
- Awarded **School Topper** Award 2011, 2012 from Army Public School, Pune
- National **top 1%** National Standard Examination in Chemistry (NSEC) 2011-2012

Relevant Projects

- **Gesture Recognition using webcam** *(May '13 - June '13)*
  Summer Project under Programming Club, IIT Kanpur
  Navigation and OS operations using gestures detected by a webcam
  Used OpenCV for image processing
  Gesture detection is implemented using SVM
- **OpenGL game** *(Aug '14 - Nov '14)*
  Semester Project, CS360: Computer Graphics
  Basic physics, textures loading, a navigable (3d) camera and blinn-phong shading using the core openGL API
  Project code

- **Bayesian Hierarchical Models for Natural Scene Classification** *(Jan '15 - Apr '15)*
  Semester Project, CS679: Machine Learning for Computer Vision
  Classifier for natural scene categories for the SceneClass13 dataset based on the paper by Fei-Fei Li and Pietro Perona.
  Uses a bag-of-words model to learn codewords in the dataset, classification is done using a Markov Chain Monte Carlo algorithm
  Project poster

- **SVM Approximation Methods** *(Aug '15 - Nov '15)*
  Semester Project, CS678: Learning with Kernels
  Theoretical study of some state of the art SVM approximation methods - LDKL and DC-Pred++
  Project report

- **Reinforcement Learning in Haskell** *(Aug '15 - Nov '15)*
  Semester Project, CS653: Functional Programming
  A library for reinforcement learning in Haskell (implementation of Q-Learn and SARSA)
  Project code

- **Data Compression using Probabilistic Inference** *(Jan '16 - Apr '16)*
  Semester Project, CS772: Probabilistic Machine Learning
  A brief survey of the state of the art probabilistic lossless data compression algorithms and experiments with these algorithms. Covered nonparametric bayesian models, markov models and neural networks
  Project report

- **Modern Cryptosystems and Attacks** *(Jan '16 - Apr '16)*
  Semester Project, CS641: Modern Cryptology
  A study of various cryptosystems including DES, AES, RSA, Elliptic Curve Cryptography, Lattice based cryptosystems, hash functions, homomorphic cryptosystems and bitcoin protocol. Also wrote attacks such as frequency based attacks, differential cryptanalysis, square attack and coppersmith (LLL) attack

- **SAT solving on GPUs** *(Aug '15 - present)*
  Undergraduate Project
  Designed an algorithm based on based on study of inference rules used in DPLL and resolution based solvers. Programmed a CUDA version of the solver for a GPU. Used libraries such as thrust, CuBLAS and arrayfire

Internships

- **Developer, Aurus Network Infotech Pvt. Ltd.** *(May '14 - July '14)*
  Worked with frameworks such as emberJS, webRTC, Yii(PHP) to develop featuers and modules of coursehub.tv and `superprofs.com`

- **Research Intern, Adobe Bigdata Experience Lab** *(May '15 - July'15)*
  Worked on summarization of articles on social media. Areas of Work:
  - Deep Learning
  - Computer Vision
  - Approximation Algorithms
  - Natural Language Processing

Relevant Courses

Machine Learning for Computer Vision	Probabilistic Machine Learning
Learning with Kernels	Probability and Statistics
Modern Cryptology	Systems and Network Security
Functional Programming	Introduction to Game Theory
Approximation Algorithms	Principles of Programming Languages

Technical Skills

- Languages: Python, C++, C, Java, PHP, Haskell, Javascript, Bash (shell scripting), Mozart/Oz, SQL, Perl, Ruby, HTML/CSS
- Frameworks: Yii (PHP), EmberJS (Javascript), Ruby on Rails
- Other tools: LaTeX, CUDA, OpenCV, Beamer, Git, GNUPlot, Octave , MATLAB , OpenGL, Autodesk Inventor, webRTC

Extra Curricular Activities

- Ex National Record holder for Rubik's Cube One Handed and Fewest Moves solving
- Competitive Programming contests - TopCoder and CodeForces (Handle: PM1729)
- Actively involved in Literary Discussion Group, IIT Kanpur

Positions of Responsibility

- **Tutor, Introduction to Programming** *(Jan '16 - Apr '16)*
  under Prof. Sunil Simon, ESc101, IIT Kanpur
  Conducting tutorials and supervising a weekly lab for a batch of 35 students
  Also designing and grading lab assignments and exam problems
- **Teaching Assistant, Data Structures and Algorithms** *(Aug '15 - Nov '15)*
  under Prof. SK Mehta, ESO207, IIT Kanpur
  Designing problems for theoretical assignments, grading of assignments and exams
  Batch size of $\approx$ 200 students
- **Coordinator, Rubik's Cube Hobby Group, IIT Kanpur** *('14 - '15)*
  Organisation of club activities and workshops in the Institute
- **Academic Mentor** *('13 - '14)*
  under Counselling Service, IIT Kanpur
  Academic mentoring for Introduction to Electrodynamics (Phy103)
  Took classes at Hostel and Institute level