Prabhsimrandeep Singh

4th Year Undergraduate
Department of Electrical Engineering
Minor in Computer Science and Engineering
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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2015 - Present	B.Tech	Indian Institute of Technology, Kanpur	9.9/10
2015	CBSE(XII)	Khalsa College Public School, Amritsar	92.8%
2013	ICSE(X)	Sacred Heart Convent School, Punga	94%

Scholastic Achievements

- Among top 1% of the 1.2 Lakh applicants in **JEE Advanced 2015**
- Received the **Academic Excellence Award** for exceptional academic performance in 2015-16 and 2016-17 academic sessions
- Received a research grant for a three months long project under the **Summer Under-graduate Research and Graduate Excellence (SURGE'17)** programme at IIT Kanpur

Industry Exposure

- **Digital Intern, Texas Instruments, Bengaluru** (*May'18- Jul'18*)
  - Created a **FIFO(First In, First Out)** TestBench Generation **Python** script, generating a customizable TestBench
  - Generated Logic For Calculating Optimal Latency in terms of number of samples using Live Comparison to save space
  - Constructed logic for catching **Overflow/Underflow** in several FIFO configurations. Used that to create assertions for both Overflow and Underflow in any generic synchronous FIFO

Key Projects

- **Short term Traffic Prediction Using DTC** (*Mar'17- Jul'17*)
  Mentor: Prof. Ketan Rajawat, Department of Electrical Engineering
  - Implemented matrix completion via rank minimization using the **SVT (Singular Value Threshold)** algorithm
  - Successfully implemented the **Dynamic tensor completion(DTC)** algorithm designed in such a way so as to utilize the multimode information to forecast traffic data while maintaining the **low rank** constraint
  - Collected Traffic data from PeMS and structured it into a 4-D tensor. Obtained MAE(Mean Absolute Error) close to 10
- **TV Denoising of Signals with Poisson Distribution** (*May'17-Jul'17*)
  Mentor: Prof. Ivan Selesnick, Department of Electrical Engineering, **New York University**
  - Learned and worked on problems related to **Sparse regularization** and **Total variation(TV)**
  - Analyzed the differences b/w Poisson noise and Gaussian noise. Determined the problems with the Poisson noise like the dependence of variance on the input signal, presence of log(x) in the fidelity term etc
  - Implemented the **TV Denoising** algorithm for Poisson noise using alternating direction method of multipliers (**ADMM**)
- **deCAPTCHA**, *Course Project* (*Aug'17- Nov'17*)
  Mentor: Prof. Purushottam Kar, Department of Computer Science and Engineering
  - Broke the online Squirrel Mail client captchas using Python and MATLAB environment in a team of 5
  - Methodolgy included Preprocessing, Segmentation, Classification. Used K-means filtering, Selective filtering among Others
  - Used CNNs/Autoencoders for Classification. Achieved an accuracy of **97.94%** with CNN and **98.24%** with Autoencoders
- **Development Intern, RTE internship, IIT Kanpur** (*May'17- July'17*)
  - **Improve Phabricator-Jenkins integration** : Show summary of compiler errors as comments on Phabricator
  - **Fix automatic version bump setup** : Bump the version number automatically. Depending on the command, it will bump the Major/ Minor/Patch accordingly before publishing the app

Technical Skills

- **Programming Languages:** C, C++, Verilog, MIPS, Python, Bash, HTML, Gawk, LaTeX, MATLAB
- **Software and Libraries:** Pandas, Git, ROS, Micro-Cap, Mentor Tools, Tensor Toolbox, Jenkins, Phabricator

Positions of Responsibility

- **Student Guide, Counselling Service Team** (*Jul'16-May'17*)
  - Guided and mentored **6 freshmen** students in acclimatizing to the Environment of the Institute
  - Coordinated with the Counselling Service and helped in the organisation of **Orientation Programme 2016**

Relevant Courses

Data Structure and Algorithms	Computer Organization	Fundamentals of Computing
Linear algebra	Probability and Statistics	Introduction to Machine Learning
Digital Electronics	Computer Networks(ongoing)	Signal,Systems and Networks
Digital Signal Processing	Wireless Communication(ongoing)	Differential Equations