VIKRAM SINGH

Research Engineer,
Physical Layer (L1) Team,
CEWiT, IIT Madras, India.

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EDUCATION

2017	*Master of Technology(SPCOM)*	*Indian Institute of Technology, Kanpur*	9.25(CPI)
2015	*Bachelor of Technology(ECE)*	*Kurukshetra University, Kurukshetra*	76.72%
2011	*CBSE-XII*	*S.A.Jain Senior Model School*	72.2%
2009	*CBSE-X*	*Tulsi Public School*	85.20%

TECHNICAL SKILLS

Programming Languages	C/C++, Java, Verilog, VHDL, TCL/Tk, Python, jemdoc+MathJax
Other software tools	Matlab, Socket Programming, CVX, Proteus, EAGLE, LaTeX
Development Platforms	Atmel, AVR, Arduino, MIT Application Inventer
Database	rdbms, MySQL
Version Control Tools	Git

ACHIEVEMENTS

- Received **Award for Academic Excellence** in recognition to meritorious performance in academic year (2017-18)(2018)
- Won **Gold** & **Silver** Medal for Hall-7(IITK) in **Cricket** and **Athletics** respectively for winning **Enthusia-2018**. (2018)
- Ranked among **Top 0.3%**(among 153000) students all over India in Electronics & Comm. Engg. **GATE**. (2016)
- Secured 1st position in **Circuit Simulation** Competition and Science Quiz (**Quizotica**) in college. (2014)
- Secured 2nd position in Electronics Junkyard in college Technical Festival **ACE ACUMEN**. (2014)
- Secured **97%, 98%** in **Computational Techniques** and **Mathematics-III** in under-graduation (2012)
- Secured **83%** in National Mathematics Olympiad**(NMO)**. (2010)

EXPERIENCE

Professional Experience

Center of Excellence in Wireless Technology (CEWiT) — **Indian Institute of Technology, Madras**
Research Engineer — *October 15, 2018- till now*
Currently working on mobility management in 5G networks. Studied blockage models specified in 3GPP for 6-100 GHz frequency range, coded in C++, tested and debug using Valgrind and cppcheck and finally integrated them to BWSim, a System level simulator, an intellectual property of CEWiT.

Intel India Private Limited — **BGA, Bangalore**
System on Chip Design Engineer — *June 2018- Oct 12, 2018*
As a part of the PCIe backend design team, I synthesized the HDL model(syn) to target technology to obtain gate level design and performed FEV for logic equivalence. Finally performed Placement and Routing(apr) of flip flops and Clock tree synthesis.

Professional Internships

Netmax Hardware Pvt Limited — *June 2013- August-2013*
Designing a very high precision and reliable temperature control system.
- Acquired the skills required in Embedded programming, designing PCB and implementing logic on hardware.
- Testing and troubleshooting the whole system and verify its specifications corresponding to user demands.

CMSR Labs — *June 2014- August-2014*
Designing an Android application and its interaction with Arduino and AVR microcontrollers.
- Designed an Android application which can send control signals to a hardware to perform certain operations.
- Devised a hardware which can interact with another system through Bluetooth module and react to it.

Campus Connect Program, Infosys
Student Intern — *August 2013- May-2014*
GUI based Chat Application using Socket Programming & Notepad, a text editor in Java.
- Learned various subjects such as Operating Systems, Software Engineering, Data Structures and OOPs Concepts.
- Gain practical knowledge in object oriented programming and database management through labs and projects.

Teaching Experience

Department of Electrical Engineering — **Indian Institute of Technology, Kanpur**
Teaching Assistant — *August, 2016- April, 2018*
I assisted professors for course in Wireless Communication and laboratory subjects in digital circuits, Microprocessor and Electronic circuits design and helped in organizing Shannon's day on the birth centenary of C.E. Shannon.

Counselling Service — **Indian Institute of Technology, Kanpur**
Academic Mentor — *Oct, 2017- April, 2018*
Academic Mentors provide academic and emotional support to students struggling with their academics. During this period, I taught Representation and Analysis in Random Signals(basics of Measure theory and Real Analysis).

NPTEL — **Indian Institute of Technology, Kanpur**
Teaching Assitant — *Jan, 2018- May, 2018*
I was a TA for the MOOC on Principles of Signals and Systems taught by Prof. Aditya Jagannatham. I was responsible for updating the portal, ensuring immaculate assignments & clearing the doubts asked by students enrolled in the course.

ACADEMIC PROJECTS

Research Experience	**M.Tech Thesis** : "Adaptive Schemes for Spatio-Temporally Correlated MU-MIMO Channel Estimation." **B.Tech Major :** "Designing a Pulse Oximeter for measuring SpO_2 using Fuzzy Logic." **B.Tech Minor :** "Design and Implementation of Wireless Surveillance Device."
Selected Projects	Internet measurement data management challenges. User Selection in MIMO Interfering Broadcast Channels. Supervised Source Localization Using Diffusion Kernals. Speed control of dc motor using analog pid and pic micro-controller. How to Mobilize MMwave: A Joint Beam and Channel Tracking Approach. Data acquisition system based upon pic micro-controller and serial interface. Manifold-Based Bayesian Inference For Semi-Supervised Source Localization. Channel Estimation for Massive MIMO Using Gaussian-Mixture Bayesian Learning. GUI based Chat Application using Socket Programming & Notepad, a text editor in Java. Comparative Analysis of Detection Filters in the Doctrine of MIMO Communications Systems.

POSITIONS OF RESPONSIBILITY

- **PG Coordinator,EEA** Coordinated in a team of 20 students and organized departmental events.
- **DPC-SPO(IITK)** Involved in process of resume verification and contacting companies for placements.
- **Teaching Assistant** I assisted professors for Digital Circuits, Microprocessor Programming and EDC Labs.
- **Academic Mentor** Took remedial classes for fresher batch and provided them academic and emotional support.

HOBBIES & INTERESTS

Hobbies Interests[1]	Simulating and Designing Electronic Circuits, Playing Cricket. Wireless Communications, Machine Learning and Sparse Signal Processing.

RELEVENT COURSEWORK

Representation and Analysis of Random Signals, Introduction to Signal Analysis, Digital Communication Networks, Estimation & Detection Theory, Wireless Communication, MIMO Wireless Communication, Statistical Signal Processing, 5G Wireless Communications[2], Adaptive Signal Processing[2], Convex Optimization, Introduction to Machine Learning, Probabilistic Machine Learning[2], Bayesian Machine Learning[2].

MOOCs COMPLETED

Game Theory **- Coursera** [3][4] — *May 22, 2019 - July 31, 2019*
by Prof. Matthew O. Jackson, Prof. Yoav Shoham & Prof. Kevin Leyton-Brown — **Stanford University, UBC**

Machine Learning **- Coursera**[3] [4] — *Aug 28, 2016 - Dec 12, 2016*
by Prof. Andrew Ng — **Stanford University**

Reinforcement Learning **- CS234** [3] — *May 2, 2019 - July 31, 2019*
by Prof. Emma Brunskill — **Stanford University**

Error Correcting Codes **- NPTEL** [3][4] — *July 15, 2013 - Dec 15, 2013*
by Prof. P. Vijay Kumar — **IISc**

Discrete Time Signal Processing **- edX** [3][4] — *Aug 31, 2016 - July 12, 2018*
by Prof. A.V. Oppenheim and Tom Baran — **MIT**

Introduction to Information Theory **- NPTEL** [3][4] — *July 15, 2017 - Dec 15, 2017*
by Prof. Adrish Banerjee — **IIT Kanpur**

Deep Learning : 5 Courses Specialization **- Coursera**[3][4] — *Dec 28, 2018 - Sept 20, 2019*
by Prof. Andrew Ng — **Stanford University**

Probability - The Science of Uncertainty and Data **- edX** [3][4] — *Aug 25, 2016 - Dec 15, 2016*
by Prof. John Tsitsiklis, Prof. Patrick Jaillet & Prof. Dimitri Bertsekas — **MIT**

Machine Learning with Python: from Linear Models to Deep Learning **- edX** [3][4] — *June 11, 2019 - Aug 15, 2019*
by Prof. Regina Barzilay & Prof. Tommi Jaakkola — **MIT**

Sparse Representations in Signal and Image Processing: Fundamentals **- edX** [3][4] — *Mar 25, 2017 - June 15, 2017*
by Prof. Michael Elad — **Technion**

Sparse Representations in Signal and Image Processing: From Theory to Practice **- edX** [3][4] — *April 25, 2019 - June 15, 2019*
by Prof. Michael Elad — **Technion**

PUBLICATIONS[5]

Vikram Singh, Suraj Srivastava and Aditya Jagannatham, "Superimposed Pilots based Adaptive Time-Selective Channel Estimation in MU-MIMO Systems," in *Proc. of the IEEE Signal Process. Adv. Wireless Commun. (SPAWC)*, 2019.

[1] For more details refer to my webpage
[2] Audited Courses
[3] Click for viewing my course Github repository which contains certificates, mid(minor) and final(major) projects, submitted coding and numerical Assignments.
[4] Click for viewing the certificate achieved for completing the course
[5] The paper was submitted to SPAWC-2019 on March 4, 2019 but its under review and yet to be accepted.