

Deeksha Lal

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Education	Masters of Science/Doctor of Philosophy in Electrical Engineering (EE) North Carolina State University, Raleigh, NC, USA	Aug 2013-Current GPA: 3.9/4
	Bachelor of Engineering in Electrical Engineering (EE) Delhi College of Engineering, University of Delhi, Delhi, India (now Delhi Technological University (DTU))	76.6% Aug 2009-July 2013
Research Experience	Research Assistant ECE Department, North Carolina State University Advisor: Prof. David Ricketts	Aug 2013-Current
	• Design of G-Band Downconverting Mixers in SiGe technology	May 2014-Current
	• Design of advanced Track-and-Hold Amplifier topologies in SiGe technology	Jan 2014-Current
Technical Skills	Software: Cadence Spectre, Cadence Virtuoso, HSPICE, MatLab, AWR Design Environment, EAGLE, LaTeX, AutoCAD	
	Measurements: High Frequency Measurement and Calibration, Vector Network Analyzer, Spectrum Analyzer, Oscilloscope, RF Signal Generator, Probe and Waveguide Measurements. Programming Languages: C/C++, Verilog (HDL), VerilogA	
Academic Projects	12-bit Successive Approximation ADC at 50MS/s in 180nm CMOS technology	Dec 2013
	• Designed a charge redistribution DAC and digital control block operating at 700MHz. • Designed a low offset and high resolution (50uV) latched comparator.	
	12-bit Pipelined ADC at 100MHz using VerilogA blocks having offset and gain errors	Nov 2013
	• Implemented a 1.5 bit MDAC and oversampled the output at 2GHz for improved ENOB. • Determined ENOB using SNDR measurements from FFT spectrum and INL/DNL calculations after performing Monte-Carlo simulations for 99.3% yield.	
	Binary weighted 8-bit Charge Redistribution DAC at 100MHz driving 500fF load in 180nm CMOS technology	Nov 2013
	• Designed and implemented a split-cap topology and optimized by deglitching.	
	Low power, fully differential Folded Cascode Operational Transconductance Amplifier (OTA) using 180nm CMOS technology	Nov 2013
	• Designed wide-swing OTA with gain boosting amplifiers and supply independent biasing. • Achieved low frequency gain of 95dB, gain-bandwidth product of 480MHz, phase margin of 75.3°, input common mode range of 1.3V and output swing of 2V ppp while operating on 1.8V and consuming 1.78mW of power.	
	2.4GHz Direct Conversion Radio Transmitter using Discrete Components on a PCB	Apr 2014
	• System designed for 4QAM & 16QAM with maximum bitrate of 120Kbps. • Custom designed Edge-Coupled Chebyshev Band Pass Filter centered at 2.4GHz with 120MHz bandwidth and <4dB insertion loss and 20dB reverse isolation across band.	
Design and Layout of a 64-bit SRAM in Standby mode and in 45nm CMOS technology	Nov 2014	
• Circuit designed for a 10T SRAM cell targeted to optimize the product of Active Energy, Delay and Standby Mode Power for a 16x4 SRAM cell array • Designed and simulated peripheral circuitry of row decoders, input demultiplexer, output multiplexer and flip flops.		
Design and Implementation of Analog Signal Processing Circuits using Active Building Blocks	Feb-May 2013	
• Explored practical realizations of oscillators and filters using dual-X second generation current conveyor (DXCCII) • Studied and verified DC characteristics and limitations of these models		

Graduate Courses	Microwave Engineering (ECE532) Principles of Transistor Devices (ECE531) Analog to Digital Converters (ECE592) IC Design for Wireless Communication (ECE712)	VLSI Systems Design (ECE546) Analog Electronics (ECE511) Radio Systems Design (ECE592)
Internships	<p>I. School of Electrical Engineering (STI) École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland Advisor: Prof. Maher Kayal <i>Developing Smart Dust : Wireless Sensor Node (WSN)</i></p> <ul style="list-style-type: none"> • <i>Designing Target Station (TS):</i> Verified and tested SPI Slave interface for a general purpose sensor in Verilog and synthesized it on an FPGA. • <i>Testing and establishing bidirectional communication between sensor and Host PC</i> • <i>Designing PCB for testing WSN:</i> Incorporated RF module and FPGA synthesized code to develop TS with minimum chip surface area. <p>II. School of Physical Sciences, Jawaharlal Nehru University, Delhi, India Advisor: Prof. Subhasis Ghosh</p> <ul style="list-style-type: none"> • <i>Characterization of alkaline batteries:</i> Developed constant current and constant resistance discharge circuits for determining characteristics of different battery types. • <i>Electrochemical dendritic growth (Cu electrodes in citric acid):</i> Investigated effects of dendrite growth in an electrochemical cell to improve battery life. 	<p><i>Jun-Aug, 2012</i></p> <p><i>Jun-Aug, 2011</i></p>
Under-graduate Courses	<p>Electrical Engineering</p> <ul style="list-style-type: none"> – Principles of Electrical Engineering – Electrical Measurements – Electrical Engineering Materials – Electromagnetics – Electronics I & II – Network Analysis – Instrumentation – Digital Electronics – Power Electronics – Microprocessors and Applications – Power Systems I & II – Power Apparatus I, II & III – Control Engineering – Design of Power Apparatus – Switchgear & Protection 	<ul style="list-style-type: none"> – Power Plant Engineering <p>Basic Sciences</p> <ul style="list-style-type: none"> – Physics I & II – Mathematics I, II, III, IV – Chemistry I & II – Applied Mechanics – Fluid Mechanics & Hydraulic Machines – Applied Thermodynamics <p>Other Engineering Courses</p> <ul style="list-style-type: none"> – Engineering Drawing – Machine Drawing – Manufacturing Processes – Report Writing – Programming I, II & III – Industrial and Organisation Managerial Economics
Awards & Honours	<ul style="list-style-type: none"> • Certificate of Merit and Scholarship by DTU for ranking amongst the first two students over three semesters in a class of 97 EE students • Scholarship, German Pedagogical Exchange Service (PAD) to Germany for a month-long educational tour, sponsored by the German Embassy and Max Mueller Bhawan. • Certificate of Merit, Indo-French Quiz (100 students selected all over India) awarded by the Department of Science and Technology, Government of India, and the Indo-French Centre for the Promotion of Advanced Research, France. • Certificate of Appreciation for leadership for youth around the world through the 2007 Special Olympics Global Youth Summit, Shanghai, China. • Bronze Medal, International Awards for Young People. The Award's concept is of individual challenge, requiring 6 months voluntary involvement in the mandatory Service, Adventurous Journey, Skills and Physical Recreation. 	<p><i>2010-2012</i></p> <p><i>2008</i></p> <p><i>2007</i></p> <p><i>2007</i></p> <p><i>2006</i></p>

**Volunteer
Activity**

- Volunteer with the Special Olympics Delhi, India.
- Volunteer at the Global Youth Summit Team at Bangkok, Thailand for the Project UNIFY Training Conference, under Special Olympics International.

2007-2008

Aug, 2008

**Extra
Curricular
Activities**

- **Editor**, The Undertones, the annual literary magazine of IEEE-DTU.
- **Editor-in-Chief**, the International Press, DelTech-Model United Nations.

Oct, 2010

Feb, 2012 & 2013
