

Radiation Pattern Measurement System for Automotive Radar *May - July 2014*

Chethan Kumar Y B, Wireless Connectivity Solutions, Texas Instruments

- Developed an automatic radar positioning system for radar modules testing
- The module provides easy control of radar position in 3D space with angular position error less than 1° in both horizontal and vertical plane and range error less than 1 mm
- It is now used to test characteristics of automotive radars used for automatic car parking

Solar Charger for Hearing Aid Devices

May - July 2013

R.S. Hiremath, Flexitron India

- Developed a pocket solar charger for R13 size batteries used in BTE Hearing aid.
- Designed energy efficient circuits for dual mode charging (AC as well as Solar).
- The product won **National Award for the Empowerment of Persons with Disabilities 2013**.
- The product is now produced in mass volumes and supplied to health organizations all over India.

ACADEMIC HONORS

- **Branch Position 2** in Electrical Engineering (Microelectronics & VLSI) out of 28 students at IIT Madras
- Recipient of **Electronics for You** prize for **best academic performance** in Microelectronics & VLSI in 4th year
- Class rank **5** out of 77 students in my batch in Electrical Engineering at IIT Madras
- Secured All India Rank **608** among 500,000 candidates in IIT Joint Entrance Exam 2011
- Secured All India Rank **1372** among over 1 million candidates in All India Engineering Entrance Examination 2011
- Secured perfect grade (S) in all four courses taken at Computer Science department.

KEY COURSE PROJECTS

Systolic Arrays in Bluespec

Aug - Nov 2015

Guide: Prof. V. Kamakoti (CAD for VLSI Systems)

- Designed and analysed different architectures of matrix-matrix multiplication using systolic arrays and implemented using Xilinx ISE
- Characterised pareto optimal nature of different solutions based on throughput and clock frequency

Hardware modeling and FPGA Implementation

Jan - May 2015

Guide: Prof. Nitin Chandrachoodan (VLSI Design Lab)

- Implemented 8-bit MIPS with 9 instructions and 3 instruction formats on Spartan 3E FPGA board
- Implemented a complete ADC-FIR-DAC design

Standard Cell Design and Layout

Aug - Nov 2014

Guide: Prof. Vinita Vasudevan (Digital IC Design)

- Designed layouts of digital logic gates in MAGIC and simulated using Spice Opus
- Characterised standard cells for different input slews and load capacitance

String Matching Problem & Variants - Review Paper

Mar - May 2014

Guide: Prof. Nitin Chandrachoodan (Data Structures & Algorithms)

- Reviewed the historical Knuth-Morris-Pratt (KMP) algorithm and other similar variants to find all occurrences of a given pattern string in a text
- Analysed the complexity of the algorithms and significance in real world applications

IC Design of a two stage fully differential operational amplifier *Mar - Apr 2014*

Guide: Prof. S. Aniruddhan (Analog IC Design)

- Designed and simulated a two stage fully differential op-amp based on 180 nm technology

SPICE Circuit Simulator

Aug - Nov 2012

Guide: Prof. Harishankar Ramachandran (CAD Lab)

- Developed a circuit solver in C similar to SPICE for solving linear circuits

Voice to Text Converter

Mar 2013

Yahoo Hack U 2013

- Developed software that converts voice input in a language to text field in other chosen language using available softwares of Google Voice Recognition and Google Translate

TEACHING EXPERIENCE

Graduate Teaching Assistant

EE5311: Digital IC Design Prof. Nitin Chandrachoodan Aug - Nov 2015

- Assisted the professor in grading (assignments and quizzes) and other logistics
- Held office hours to help the students with the assignments and cater their queries

EE5332: Mapping Signal Processing Algorithms to DSP Architectures Jan - May 2016

RELEVANT COURSES

Electrical

Computer Organisation & Microprocessors, Mathematical Methods in Circuit Analysis, Mapping Signal Processing Algorithms to DSP Architectures, Digital IC Design, Analog IC Design, Digital Systems, VLSI Technology

Computer Science

CAD for VLSI Systems, Digital Design Verification, Digital Systems Testing & Testable Designs, Data Structures & Algorithms, Computational Engineering

Mathematics & Others

Combinatorial Optimization, Fundamentals of Operational Research, Decision Modelling, Probability Foundations for EE, Linear Algebra & Numerical Analysis, Calculus, Complex Variables and Transform Techniques

Labs

VLSI Design Lab, Microprocessor Laboratory, Advanced Microelectronics Lab, CAD Lab, Digital Circuits Lab, Analog Circuits Lab

HARDWARE AND SOFTWARE SKILLS

Languages

- Good knowledge of *C++*, *C*, *Verilog*, *Python*, *Bluespec*
- Working knowledge of *Java*, *Shell Scripting* and *HTML*

Packages and Tools

- *Eclipse*, *MATLAB*, *Xilinx ISE*, *PlanAhead*, *Vivado*, *Spice*, *Magic*, *L^AT_EX*
- Working knowledge of *ARM*, *MSP430*, *ModelSim*, *Keil*

CO-CURRICULAR AND EXTRA CURRICULAR ACTIVITIES

- Won **First prize** at **Pan IIT Research Expo 2014** among participants from all IITs
- Won **Second prize** at **National Level Student Competition on Renewable Energy 2014** organized by TEDA¹ & IEEE SIGHT
- Won **Third prize** in **Paper & Poster Presentation** at Shaastra² 2014
- Member of Mandakini hostel Water Polo team
- Regular voluntary blood donor to TTK – VHS Blood Bank

OTHERS

- **Alumni Affairs Secretary** of Mandakini hostel, 2013-14
- Member of Sustainability Network (S-Net) team 2011-12 for National Service Scheme (NSS), IIT Madras
- Contraptions event team member for Shaastra 2011 and Hospitality team member for Saarang³ 2012
- Student member of ACM and ACM SIGDA

¹ TEDA - Tamil Nadu Energy Development Authority

² Shaastra is the annual technical festival of IIT Madras

³ Saarang is the annual cultural festival of IIT Madras

REFERENCES

Professor Nitin Chandrachoodan

Department of Electrical Engineering
Indian Institute of Technology Madras
<http://www.ee.iitm.ac.in/~nitin>

Professor V. Kamakoti

Department of Computer Science
Indian Institute of Technology Madras
<http://rise.cse.iitm.ac.in/people/faculty/kama/kama.html>

Professor Nandita DasGupta

Department of Electrical Engineering
Indian Institute of Technology Madras
<http://www.ee.iitm.ac.in/~nand>

Professor Vinita Vasudevan

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<http://www.ee.iitm.ac.in/~vinita>