Purnendu Kumar

MSEE Application and Instrumentation

Best way to predict the future is to create it.

Education

2014–2017 **MS by Research**, *Indian Institute of Technology Madras*, Chennai, *8.47*.
Analog circuit, High speed design, Instrumentation for Particle detector

2009–2013 **BE**, *G H R C E*, Nagpur, *73.09%*.
Electrical Engineering, Electronics and Power

Master thesis

title *Design and characterization of discrete analog front-end for resistive plate chamber (RPC) detector*

supervisors Dr. Aniruddhan Sankaran, Dr. Anil Prabhakar

description Resistive Plate Chamber (RPC) detector gives nanosecond electrical pulses with a few millivolts of amplitude at 50 Ohm termination impedance. For accurate timing data abstraction using a precision TDC, it is required to have a very accurate front-end with lowest possible time-walk and jitter in the output signal. Thesis emphasis on design of high gain broadband amplifier, and to characterize CFD with varying delays to get best possible slope on both rising edge and falling edge of signal for precision time measurement. A 0.35 ns improvement over 1.55ns of leading edge discriminator was obtained by use of ARCD topology and ac coupling for fast return to zero.

Experience

Regular

2014–2017 **Project Associate**, *IIT Madras*, Dept. of Physics, Chennai.
Instrumentation for INO project.
Achievements:
- Update of RPC-DAQ schematic for switched power supply.
- Test methodology development for RPC Test-jig, Pin-Assignment for FPGA, and schematic design.
- Design of LC ladder based sub-nanosecond stepped electronically controlled delay circuit.

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2013–2014 **Junior Research Fellow**, *University of Delhi*, Dept. of Physics and Astrophysics, Delhi.
RPC Electrode characterization for INO Project
Achievements:
- Programming CAEN VME data acquisition system.
- Assembly of Plastic scintillator with photo-multiplier tube and characterization.
- Assembly and characterization of multiple glass and bakelite RPC.

Vocational

Nov. 2011 **Intern**, *Patratu Thermal Power Station*, Pataratu, Jharkhand.
Transformers, switching stations

Nov. 2010 **Intern**, *Bharti Airtel Limited*, Patna, Bihar.
Power management at tower site, centralized failure monitoring

Languages

C	Intermediate	*2010 - Present, GCC, C99*
Python	Intermediate	*2014 - Present, Spyder IDE*
Verilog	Intermediate	*2015 - Present, DSP Architecture optimization, VLSI Lab*
C++	Basic	*NIIT certification 2010, Visual CPP, QT, G++, C++11*
HTML,PHP	Basic	*2015 - Present (satakshi.in)*

Computer skills

EDA	Allegro, Eagle, KiCad	Application	MATLAB
Device Simulation	Virtuoso-IC, Vivado, Quartus	Circuit Simulation	Spice Opus, NGSpice, LTSpice
CAD	Wings3D, Sketch-up	Documentation	MS Office, Libre Office, tex

Interests

Blogging	blog.satakshi.in
Circuit design	EEZ-PSU hardware issue debugging (github)
Coding	Active on Hacker Rank (Algorithm challenge)

Co Curricular

Workshop **MATLAB based Image Processing**, *by MagicMan Technologies*, Mumbai, 06-2012.
Design of MATLAB based line/object/gesture follower robot

Extra Curricular

- Hovercraft design competition finalist at kshitij-2011 (IIT Kharagpur).
- Co-ordinator at EPICS-2011, G H R C E, Nagpur.
- Represented R. K. College, Madhubani in inter college table-tennis tournament (L. N. M. University, Darbhanga, Bihar) 2006.

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References

IITM
- Dr. Anil P.
- Dr. Aniruddhan S.
- Dr. P.K.Behera

DU
- Dr. Md. Naimuddin,
- Dr. Ashok K.

All the rest & some more
Dr. S.B.Bodke (GHRCE), and *Dr. Satyanarayna B. (TIFR)*

Publications

[1] Purnendu Kumar, Aniruddhan S., and Anil P. Design and implementation of discrete analog front-end for resistive plate chamber (rpc). XXII DAE BRNS High Energy Physics Symposium, Delhi, 2016.

[2] Md Naimuddin, D Kaur, P Kumar, A Gaur, Md Hasbuddin, S Mishra, and A Kumar. Characterisation of glass electrodes and RPC detectors for INO-ICAL experiment. *Journal of Instrumentation*, 9(10):C10039–C10039, oct 2014.

[3] A. Kumar, A. Gaur, Md. Hasbuddin, P. Kumar, D. Kaur, S. Mishra, and Md. Naimuddin. Study of RPC bakelite electrodes and detector performance for INO-ICAL. *Journal of Instrumentation*, 9(10):C10042–C10042, oct 2014.

[4] Daljeet Kaur, Ashok Kumar, Ankit Gaur, Purnendu Kumar, Md. Hasbuddin, Swati Mishra, Praveen Kumar, and Md. Naimuddin. Characterization of 3mm glass electrodes and development of RPC detectors for INO-ICAL experiment. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, nov 2014.

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