

## R E S U M E



1. Name : **DEEPAK KUMAR SYAL**
2. Date of Birth : **19<sup>th</sup> October, 1961**  
Age : **45 years**
3. Address for : **H.No.3265, Sector 35D, Chandigarh**  
correspondence
4. Professional Qualification : **B. Tech. In Electrical Engineering  
BHU-IT, Varanasi , 1983**  
: **M.E. in Electrical Engineering  
PEC, Chandigarh**
5. Member of Professional Bodies : **Member, IEEE Signal Processing society, USA**  
**Member, IEEE Circuits & systems society, USA**  
**Life Member, Systems Society of India,**  
VSSC, Trivandrum  
**Life Member and Executive member (2005-06),  
Indian Microelectronics  
Society,PU,Chandigarh**  
**Life Member, Society for the care of the blind**  
**Member Board of studies**  
**M.Tech VLSI Design, PTU, Jalandhar**  
**M.E. Electronics Product Design and  
Technology, PU, Chandigarh**  
**M.E. Electronics and Communication,**  
PU, Chandigarh  
**M.E. Information Technology, PU, Chandigarh**  
**M.Sc. Bioinformatics, PTU, Jalandhar**
6. Experience : **A total experience of 23 years and 6  
months in prestigious Institutions in  
core R&D as mentioned below :**

**A) VLSI Design Department of Semiconductor Complex limited, SAS  
Nagar ( from June 1983 to November, 1991 of 8½ years)**

**Major Projects as Project Leader are :**

- Development of Logic and Circuit simulation CAD Software
- Project Leader for Development of ASIC VLSI Design system -  
BEACON

**B) R&D/ PDT Department of CEDTI/C-DAC, Mohali, ( November, 1991  
– continuing of 13 years 2 months)**

**Additional Director and Head :**

- Research and Development
- Product Design and Technology (upto 2005)

**Programme Coordinator :**

- M.E. Electronics Product Design and Technology (upto 2005)
- M.Tech. VLSI Design
- DESD Programme of C-DAC at Mohali

**C) Director-in-charge of CEDTI, Calicut, Kerala : *September, 1998 to January 2000 for 16 months***

As Technical and administrative Leader there was overall improvement of Productivity in the Institution by way of Initiation and completion of several Projects and Joint Projects and M.Tech Programme and programmes with National level institutions in the region (VSSC-Trivandrum, CWRDM-Calicut, NIT-Calicut, IIM-Calicut, BPL-Palakkad , PDS-Peermade , SIDBI-Cochin, TISCO-Jamshedpur etc.), acquisition of major financial assets (15 acres of Land & UNDP funds for equipment), substantial increase in revenue and achievement of self sufficiency (2½ times from 41.5% to 102.8%) and staff motivation.

**NATIONAL LEVEL SPONSORED R&D PROJECTS AS CHIEF INVESTIGATOR  
FROM NATIONAL BODIES**

At CEDTI, Mohali and CEDTI, Calicut

- Project :** Development of low cost speech card attachment to STD-PCO monitor for visually Handicapped which can speak out the called number, duration of talk and total charges in English.

**Funding Agency:** Sponsored by MOSJ&E, DRC, MOW, Rs.6.65 lacs.

**Status:** Technology exhibited in International Exhibition at Lucknow in March, 2000. **Complete.**
- Project:** Design and Development of low cost Hardware for Remote telemetry of Rain gauges and Stream gauges and upgradation of existing mechanical gauges to electronics for remote telemetry

**Funding Agency:** Sponsored by Department of Science & Technology Rs.9.86 lacs.

**Status:** Joint Project with CWRDM, Calicut, 5 Rain gauge sites and 2 stream gauge sites have been established in various parts of Kerala. **Complete**
- Project:** Design and Development of low cost Adult Literacy Teaching Aid.

**Funding Agency:** Sponsored by AESRD, DoE, Rs.1.5 lacs (1993) & Rs.17.89 lacs (1997)

**Status:** Literacy systems **SARTHI** with Hindi & Punjabi Primer field trialed in 1995 and Literacy systems **SARTHI-2** with addition of Pictures and Sound . **Complete.**

Under a separate Project from MHRD at Rs. 24 lacs, 50 units of SARTHI-2 have been fabricated and are undergoing field trials
- Project:** Recognition of Tool wear using Acoustic signals from tool operation and DSP techniques.

**Funding Agency:** Swiss Development cooperation, Faculty Exchange Programme, University of Neuchatel, Switzerland.

**Status:** *Complete*

5. **Project:** Initiation of M.Tech VLSI Design at C-DAC, Mohali (2004 -2009)  
**Funding Agency:** Department of Information Technology, New Delhi. The Project budget is Rs.128 lacs.  
**Status:** *Ongoing*. The First batch (2004-06) of 18 students are well placed in prominent Industries/Institution with the highest annual package of Rs. 6.7 lacs

### **CONTRIBUTION IN MASTER LEVEL & CORE DESIGN COURSES AS FACULTY**

- A) M.Tech VLSI Contribution as Programme Coordinator and faculty**
1. VLSI Design Concepts
  2. VLSI Design Lab
  3. ASIC Design with FPGA
  4. Embedded Systems
  5. Advanced Digital Signal Processing
  6. Testing and fault tolerance
  7. Designing with FPGA Lab
  8. Digital system processing and Embedded system Lab
  9. Guidance to M.Tech VLSI Student Thesis work
- B) Contribution as Faculty and coordinator in ME (EPDT) upto 2005 conducted jointly with Punjab Engineering College (PEC)**
1. Industrial Design of Electronic Equipment.
  2. Peripheral System Design and Interfacing.
  3. Guidance to M.E. Student Thesis work.
- C) Contribution as Faculty in other Programmes**
1. ASIC Design Methodology and FPGA (CEDTI, Mohali)
  2. Microcontroller Based System Design (CEDTI, Mohali)
  3. Microprocessor Based System Design (CEDTI, Mohali)
  4. PC Based System Design (CEDTI, Mohali)
  5. Product Design Methodology (CEDTI, Mohali)
  5. "Microprocessor, Peripherals and Interfaces" in the M.E., Computer Science programme at TTTI, Chandigarh.
  7. Digital Signal Processing (for BPL, Palkaad and BEL, Panchkula R&D Engineers)
  8. Diploma in Embedded System Design ( C-DAC, Mohali) in DSP

### **GUIDANCE FOR POST GRADUATE STUDENT THESIS WORK**

At CEDTI/C-DAC, Mohali

1. Development of Alphabets using B-spline curves  
(MCA student Thesis, complete)
2. Design of a CAD framework.

- ( MCA Student Thesis, complete)

3. Design of Multiloop Auto-Tuning PC based PID control for Process industries.  
(M. Tech. Student Thesis, complete)
4. Design of Accurate LVDT Sensor and Instrumentation software.  
(M. Tech. Student Thesis, complete)
5. Design and Development of Microcontroller based Water Purifier  
(ME., EPDT Student Thesis, complete)
6. Design of Soil Moisture probe and Measurement, Indicator  
(ME., EPDT Student Thesis, Complete)
7. Animation of Speech Phonetics.  
(M.Sc. IT Student Thesis, Complete)
8. Temperature measurement in HPA lamp based UV Exposure Unit.  
(ME., EPDT Student Thesis, Complete)
9. Design of 5 axis Robot Arm.  
( R&D Student Project, Complete)
10. Phoneme Library Development And Evaluation Package For Text-To-Speech System  
(M.Sc. IT Student Thesis, Complete)
11. Fiber Optic Based Wafer Alignment System  
(ME., EPDT Student Thesis, complete)
12. Development Of Sensor Element, Microcontroller Instrumentation For Low Vacuum Measurement  
(ME., EPDT Student Thesis, complete)
13. Development Of Low Cost, Four Stages Programmable Spin Coating System  
(ME., EPDT Student Thesis, complete)
14. Development of Sensor Element and Microcontroller Based Instrumentation and Display System For The Measurement of Atmospheric Pressure and Altitude .  
(ME., EPDT Student Thesis, complete)
15. Development of Synthetic Milk Tester  
(ME., EPDT Student Thesis, complete)
16. Recognising 2-D Shapes Using Image Processing  
(ME., TTTI/PU Student Thesis, complete)
17. Speaker Independent Discrete Speech Recognition  
(ME., TTTI/PU Student Thesis, complete)
18. Development Of Microcontroller and Instrumentation Based Output Control of High Temperature Sensor Element  
(ME., EPDT Student Thesis, complete)
19. Microcontroller based cellular enabled security system  
(ME., EPDT Student Thesis, complete)
20. Gps based Mobile Tracking  
(ME., EPDT Student Thesis, complete)
21. Microcontroller Based Mobile Enabled Instrument for Landslide Monitoring  
(ME., EPDT Student Thesis, complete)
22. Face Recognition by Eigenfaces  
(MCA student Thesis, complete)
23. Design of Seismic sensor and Measurement Indicator.  
(ME., EPDT Student Thesis, Complete)
24. Instantaneous Digital Energy Measurement.  
(ME., EPDT Student Thesis, complete)
25. Design of Wind speed & Wind direction Sensors and Measurement Indicator.  
(ME., EPDT Student Thesis, complete)
26. Design of Solar radiation Sensors and Measurement Indicator.  
(ME., EPDT Student Thesis, complete)
27. Design of a electrotactile display for haptic perception of simple patterns.

- (ME., EPDT Student Thesis, complete)
28. Design of a tactile device for haptic shape perception.  
(ME., EPDT Student Thesis, complete)
  29. Development of a vibrotactile device for color perception.  
(ME., EPDT Student Thesis, complete)
  30. Design of a force feedback device for haptic perception of GUI components.  
(ME., EPDT Student Thesis, complete)
  31. Design and Development of MPEG Audio Decoder using ADSP-2181  
(M.Tech Instrumentation Student Thesis, complete)
  32. Audio Signal Processing using ADSP-2181  
(M.Tech Instrumentation Student Thesis, complete)
  33. Design and Implementation of Data Encryption and Decryption Processor  
(M.Tech VLSI Student Thesis, complete)
  34. Design and Implementation of Peripheral Controller  
(M.Tech VLSI Student Thesis, complete)
  35. Design and Implementation of Display Controller  
(M.Tech VLSI Student Thesis, complete)
  36. Design and Implementation of Extended RISC 8051 Microcontroller  
(M.Tech VLSI Student Thesis, complete)
  37. Design and Implementation of Fixed and Floating Point FFT Processor (DIT based)  
(M.Tech VLSI Student Thesis, complete)
  38. Design and Implementation of Extended RISC 80186 CPU  
(M.Tech VLSI Student Thesis, complete)
  39. Design and Implementation of LIFO/FIFO and Dual Port Memory  
(M.Tech VLSI Student Thesis, complete)
  40. Design and Implementation of High speed Double Precision MAC Co-processor  
(M.Tech VLSI Student Thesis, complete)
  41. Design and Implementation of LPC Processor  
(M.Tech VLSI Student Thesis, complete)
  42. Design and Implementation of Interrupt Controller  
(M.Tech VLSI Student Thesis, ongoing)
  43. Implementation of Adaptive Filter on ADSP 2181  
(M.Tech VLSI Student Thesis, complete)
  44. Design and Implementation of PCI Bus Controller  
(M.Tech VLSI Student Thesis, complete)
  45. Design and Implementation of VME Bus controller  
(M.Tech VLSI Student Thesis, complete)
  46. Design and Implementation of Fixed and Floating Point FFT Processor (DIF based)  
(M.Tech VLSI Student Thesis, complete)
  47. Development of a Humidity measurement system  
(M.Tech VLSI Student Thesis, Ongoing)
  48. Design and Implementation of Quad FIR Filter Processor  
(M.Tech VLSI Student Thesis, complete)
  49. Design and Implementation of 64 bit Fixed Point MAC Processor  
(M.Tech VLSI Student Thesis, complete)
  50. Design and Implementation of Floating Point Math Co-processor  
(M.Tech VLSI Student Thesis, complete)

**Presently 9 students of M.Tech VLSI Design (2005-07) are doing their thesis under my guidance**

### **EMBEDDED SYSTEMS AND INDUSTRY SPONSORED PRODUCTS**

At CEDTI, Mohali

1. **Project:** Design and Development of Electronic Control Panel to monitor and Control Engine and Alternator parameters in DG sets.  
**Funding Agency:** Sponsored by Meera & Co., Ludhiana, Rs.2.0 lacs  
**Status:** Project Development **Complete** Technology transfer in progress.
2. **Project:** Engine vibration Analysis of Tractor Engines.  
**Funding Agency:** Punjab Tractors Limited, SAS Nagar, Inhouse, Rs.0.76 lacs.  
**Status:** **Complete.**
3. **Project:** Production, Planning and Control Package.  
**Funding Agency:** Sponsored by Telephone Cable Limited., Mohali, Rs. 0.6 lacs.  
**Status:** **Complete.**(Contributed as Team Member)
4. **Project:** Clock / Timer Products based on SCL timer IC's.  
**Funding Agency:** Sponsored by Semiconductor Complex Limited, SAS Nagar. Rs.0.53 lacs.  
**Status:** **Complete.**
5. **Project:** 10 channel Trans-Receive, 30 channel Trans-Receive and 120 channel Trans-Receive FPGA's ( 8 nos.)  
**Funding Agency:** Sponsored by Punjab Communication Limited., SAS Nagar, Rs.5.5 lacs.  
**Status:** **Complete,** ( Project was initiated by ER&DC, Mohali which after merge with CEDTI, Mohali became R&D, department under me.
6. **Project:** Consultancy Project – DPR for setting up of CEDTI at Tezpur University, Tezpur, Assam.  
**Funding Agency:** Vice Chancellor, Tezpur University, Tezpur. Rs.3.0 lacs.  
**Status:** **Complete,** Tezpur CEDTI is presently functional.

### **RESEARCH PAPERS**

1. "Technology for the Handicapped", 6<sup>th</sup> National Conference on "Developing Linkages" between Rehabilitation Council of India and Institutes for Rehabilitation of disabled in North – Western India, February 18-20, 2002, at Department of Education, Punjab University, Chandigarh
2. "Information Technology for Watershed Development", Regional Workshop on Watershed Development, Management and Evaluation in Western Ghats of India, 28-29 Feb., 2000 at CWRDM, Calicut.
3. "Methodology for Remote Telemetry of Water Gauges for Instant Rainfall and River Discharge - a Pilot Approach" Kerala Science Congress from Jan. 28-28, 2000 at Peermade Development Society, Iddukki Dist. Kerala.
4. "Design Methodology of a versatile low cost speech attachment to instruments for Visually Handicapped" Kerala Science Congress from Jan. 28-28, 2000 at Peermade Development Society, Iddukki Dist. Kerala.
5. "Remote Telemetry of Water Gauges for Instant Rainfall and River Discharge" in National Conference on "Information Technology & Social Development Productivity" from May 14-16, 1999 at CEDTI, Mohali.

6. "Multi-language Speech Attachment to Instruments for Visually Handicapped "in National Conference on "Information Technology & Social Development Productivity" from May 14-16, 1999 at CEDTI, Mohali.
7. "A Versatile Low Cost Generic Teaching Aid for Adult Literacy" in 1996 in International Conference on Educational Computing at TTTI, Chandigarh.
8. "Low Cost Innovative Teaching Aid with National Literacy Mission Primers" at National Conference on Emerging Trends in Electronic Product Design and Technology from April 6-8, 1995 at CEDTI, Mohali
9. "A low cost PC based CAD Framework for power system studies" in 8th National Power Systems Conference during December 14-17, 1994, at Indian Institute of Technology, New Delhi.
10. "Low Cost Teaching Aids for Rural Literacy and Persons with Disabilities" in National Seminar on Mainstreaming Persons With Disabilities in Technical and Vocational Education from 16-17 October 2003 at NITTTR, Chandigarh.
11. "Embedded systems and MEMS structures for Tactile Displays", Invited talk in the Indian Microelectronics Society – Conference 2005, 18-19 Feb 2005, at Panjab University, Chandigarh.

### **M.Tech Student Research Papers**

1. "A VLSI Architecture for Multi-function Display Controller" by Kamal Jeet and Deepak Kumar Syal. Indian Microelectronics Society – Conference 2006, at Kurukshetra University, Kurukshetra.
2. "A VLSI Implementation Of Multi Function Programmable Peripheral Controller Mega Cell" by N.Srinath and Deepak Kumar Syal . Indian Microelectronics Society – Conference 2006, at Kurukshetra University, Kurukshetra.
3. "High Speed implementation of Floating Point Adder" by Harpreet Vohra and Deepak Kumar Syal in . Indian Microelectronics Society – Conference 2006, at Kurukshetra University, Kurukshetra.
4. "Implementation of Modified LMS Algorithm for Background Noise Cancellation" by Rachna Manchanda and Deepak Kumar Syal in . Indian Microelectronics Society – Conference 2006, at Kurukshetra University, Kurukshetra.

### **EDUCATIONAL VIDEO FILMS**

#### Four Video Films on:

- |      |                |   |                               |
|------|----------------|---|-------------------------------|
| i)   | Microprocessor | - | Programming Techniques        |
| ii)  | Microprocessor | - | I/O Interfacing               |
| iii) | Microprocessor | - | Troubleshooting and Diagnosis |
| iv)  | Microprocessor | - | System Design                 |

These films were relayed in a World Bank Aided Satellite, based teaching experiment for Polytechnic Systems (STEPS Projects - a joint project by NPIU, TTTI, ISRO and IETE). The Films were produced by TTTI, Chandigarh.  
**I was subject expert, scriptwriter and presenter for the above films.**