

VLSI Design Centre @ BESUS

The pioneering venture in eastern India for Business Incubation in VLSI design and embedded systems

A collaborative initiative of

**Bengal Engineering and Science University –Shibpur
(BESUS)**

sponsored by

DIT, Govt. of West Bengal

VLSI Design Centre

- The concept and Objective

- ❑ Promoting VLSI research and education leading to product development and commercialization.
- ❑ Facilitating young entrepreneurs / Non-VLSI Design Companies to establish VLSI Design and Embedded System startups in West Bengal.
- ❑ Encouraging VLSI design house for setting up their industries in Eastern India.
- ❑ Aiding existing companies through access to the expensive EDA tools, and infrastructure available with the Centre
- ❑ The 'VLSI Design Centre' set up at Bengal Engineering and Science University, Shibpur, which will actively work with the proposed 'India Design Centre' to be set up by DIT, Govt. of WB. India Design Centre' will be responsible for providing proper infrastructure and facilities to set up VLSI design industries in this state.

VLSI Design Centre

- The concept and Objective

- ❑ To Create awareness about VLSI Technology among the students/Researchers as a potential field of Research and entrepreneurship
- ❑ To create specialized VLSI Design skill among the students.
- ❑ To Provide Specialized training and services to existing VLSI Design Centre
- ❑ To promote research and project collaboration between BESU and existing VLSI Design and Embedded system organizations.
- ❑ To encourage VLSI design house for setting up their industries in Eastern India by providing infrastructural supports with nominal charge from this Incubation Centre.
- ❑ To help in chip design programme.

The Host Institution

- ❑ BESUS – The 154 Years tradition of Technical Education in India.
- ❑ Located at Calcutta the Oldest Seat of Learning in India with abundance of human talent pool.
- ❑ The Technology Hub for the entire eastern and North Eastern India as well as Gateway to neighbouring Countries

BESUS – The potential in research and
education in VLSI Design and Embedded
Systems

-
- During late 90's, the then Bengal Engineering College (DU) was acknowledged as one of the promising centers for VLSI education and research.
 - In 1998, DoE/MIT project – “*Special Manpower Development for VLSI Design and Related Software*”: Phase I (SMDP:-I) under 9th plan awarded to BESUS with other 18 Indian leading Institutes.
 - In 2005, *Ganapati Sengupta VLSI Lab* (GSVLSI) at BESU, Shibpur has been set up by North California BEC alumni Association, USA to promote research and education in VLSI Design and related field.

-
- ❑ In year 2005, DIT awarded SMDP-II project.
 - ❑ The School of VLSI Technology was established during 2005-06 academic session to create proper facilities for promoting VLSI Research and education.
 - ❑ M.TECH (VLSI Design) course under SMDP-II project has been started during academic session 2006-2007.
 - ❑ Faculty members from different departments/School are actively involved in research activities in VLSI school.
 - ❑ The faculty members published large number of research papers in international journals (IEEE/ACM) and peer reviewed conference proceedings (IEEE/ACM).
 - ❑ PhD students are actively working in VLSI CAD, Design and Testing and related areas.

India Chip Programme

School of VLSI Technology (BESUS) took part in the following Chip Design Programme.

- ❑ A part of a central chip named VCO has been designed and fabricated under India Chip program of SMDP II project from Austrian Microsystems during 2007–2008.
- ❑ During 2009–2010, under India Chip programme, a design of as part of a chip in collaboration with I.I.Sc, Bangalore on 'High sensitivity Amplifier Integrated Voltage controlled Oscillator Chip' has been fabricated with foundry assistance from Austrian Microsystems (under Euro practice) during 2009–2010.
- ❑ Another Design of a Chip on Low Frequency, Low Jitter Clock Generator and Low Slew Rate comparator in collaboration with I.I.T, Kharagpur already sent for tape out to Euro practice.

-
- ❑ To create awareness about VLSI Technology among the students/Researchers/ new budding entrepreneurs/ company as a potential field of Research and entrepreneurship, DIT, Govt. of West Bengal has initiated to set up VLSI incubation centre at University.

 - ❑ BESU has been selected as potential university for setting up this incubation centre.

 - ❑ This incubation centre will be inaugurated very soon.

Available Research and PG Programme in various related disciplines

- Ph.D. (1) VLSI DESIGN, TEST, CAD, Imbedded systems, (2) Electronics and Micro-electronics, (3) Computer Science and Engineering, 4) Information and Communication Engineering
- M.E./M.Tech. (1) VLSI Design, (2) Electronics and Micro-electronics, (3) Computer Science and Engineering, 4) Information and Communication Engineering
- B.E. (1) Electronics and Micro-electronics, (3) Computer Science and Engineering, 4) Information and Communication Engineering.

Current Research Focus

- ❑ VLSI Synthesis and Verification
- ❑ Algorithms for VLSI CAD
- ❑ Designing Digital Micro-Fluidic Biochip
- ❑ High Performance VLSI Architecture for Cryptographic and Communication circuits
- ❑ Network-on-Chip Design and Test
- ❑ System on Chip Design and Test
- ❑ 3D Physical Design
- ❑ VLSI Implementation of DSP and Image Processing
- ❑ RF-VLSI
- ❑ Analog and Mixed Signal IC Design
- ❑ Mems based Sensor design
- ❑ FPGA Based Embedded Systems
- ❑ Performance Analysis of Nano-tube based interconnects.

Research Infrastructure

EDA Tools:

- ❑ Mentor Graphics
- ❑ Synopsis
- ❑ Cadence
- ❑ Co-Ware
- ❑ Magma
- ❑ Xilinx ISE (FPGA)

FPGA Board

- ❑ FPGA Spartan 3E Kits
- ❑ XUP Virtex-II Pro Board
- ❑ Video Decoder Board
- ❑ Other Accessories

Completed and Ongoing Research Projects in collaboration with

- ❑ SMDP-I, DIT, Govt. of India**
- ❑ N.C.G.A.A., North California, USA**
- ❑ Intel (USA)**
- ❑ Fujitsu (USA)**
- ❑ SMDP-II, DIT,MCIT, GOVT., India**
- ❑ VLSI Design Centre, DIT, Govt. of WB**

Activities Envisaged

- ❑ To Provide facilities (CAD Tools, infrastructure) for budding entrepreneurs/Companies to develop their setups.
- ❑ To conduct a countrywide survey to find suitable talents for future VLSI industries.
- ❑ To provide guidance to interdisciplinary people for potential VLSI related applications in their respective fields.
- ❑ To Provide training on latest VLSI CAD tools
- ❑ To provide skilled BE/ME/PhD. Students in the area of VLSI and Embedded Systems to New entrepreneurs/Company
- ❑ To Provide facilities to students and researchers in the emerging area of VLSI.
- ❑ To Help in fabrication of VLSI Chip designed by students and faculty members.
- ❑ To Project collaboration with silicon industry.

Primary Contacts

- A) Prof. Ajoy Ray, Vice-Chancellor,
Bengal Engineering and Science University, Shibpur
Email: vc@becs.ac.in , ajoy_ray2004@yahoo.com
Phone: + 91-33-2668-2674,
Mobile: + 91-9434004711
- B) Dr. Hafizur Rahaman, Professor
Bengal Engineering and Science University, Shibpur.
Email: rahaman_h@yahoo.co.in, rahaman_h@it.becs.ac.in
Phone: 91-33-2668-4561 to 63 (ext- 260/309)
Mobile: + 91-9433895027
Webpage: <http://it.becs.ac.in/~hrahaman/>