DR. BIPUL DAS

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Objective: Challenging full-time position in VLSI for signal/image processing or medical imaging.

Educational Background:

Doctor of Philosophy in **Electronics and Electrical Communications Engineering** **(April 2003)**
Advisor: Prof. Swapna Banerjee
Indian Institute of Technology Kharagpur, India
Thesis title: VLSI Implementation of Biomedical Image Processing Algorithms

Developed (a) unified architecture for DFT/DHT/DCT/DST, (b) algorithm for video coding using real-time 3-D wavelet transform, and (c) low-complexity encoding. Implemented coding algorithms in VLSI using FPGAs, and ASIC on Synopsys and Cadence platforms. Also, developed new contour detection technique for irregular biomedical (e.g. Doppler) images.

Master of Science in **Electronics and Electrical Communications Engineering**
Specialization in Integrated Circuits and Systems Engineering **(August 1999)**
Indian Institute of Technology Kharagpur, India
Advisor: Prof. Swapna Banerjee CGPA: 9.0 / 10.0
Thesis title: Knowledge-Based Doppler Velocimeter System

Designed mixed signal circuit for Doppler ultrasonography system and a knowledge base system for automated medical diagnosis, using probability and artificial neural network model.

Master of Science in Electronic Science
University College of Science and Technology, University of Calcutta, India **(May 1996)**
Advisor: Prof. Sudakshina Kundu Percentage Marks: 74.0 %
Thesis title: Characteristic Study of Heterojunction Devices

Bachelor of Science in Physics (H)
Belur Ramakrishna Mission Vidyamandira, University of Calcutta, India **(May 1994)**

Experience:

1. **Post-Doctoral Research Fellow**, Medical Image Processing Group, Department of Radiology, University of Pennsylvania, Philadelphia, May 2003 – present.
2. **Visiting Scholar**, Power Electronics Research Lab, Electrical Engineering and Computer Science, University of Illinois, Chicago, Sep. 2002 – May 2003. Duties involve (a) Design of synchronous rectifier, (b) DMOS characterization and modeling, (c) SiC Schottky diode study.
3. **Institute Scholar**, Electronics and ECE, IIT Kharagpur, Sep. 1999 – Jul. 2002
   VLSI implementation of image compression algorithms, under Prof. Swapna Banerjee.
4. **Teaching Assistant**, Electronics and ECE, IIT Kharagpur, Jan. 2000 – present
   Basic Electronics, CAD of VLSI & Analog Circuits lab, under Prof. S. Sanyal, Prof. S. N. Srivastav.
5. **Project Assistant**, Computer Aided Design Lab, IIT Kharagpur, Jan. 1997 – Sep. 1999
   Designed FPGA based spectrum analyzer, and knowledge base for Doppler ultrasonography.
6. **Trainee in Cadence's Design Tools and Flow**, Cadence, IIT Madras, Nov. 2000
   Silicon ensemble and analog artist for mixed signal design.
7. **Trainee in VHDL**, D'GIPRO VLSI Training Center, IIT Delhi, Sep. 2000
   Chip synthesis and test synthesis using SYNOPSYS tool.
8. **Project Visitor for PCB Design**, Bhaba Atomic Research Center, Bombay, Nov. 1999
   Designed printed circuit board for mixed signal application (biomedical).

Publications:

Refereed Journal Papers

1. B. Das and Swapna Banerjee, "A Low Complexity Architecture for Complex Discrete Wavelet Transform", *IEE Proc.- Computers and Digital Techniques*, under revision.

2. B. Das and Swapna Banerjee, "Data Folded Architecture for Running 3D DWT for 4-tap Daubechies Filter", *IEE Proc.- Computers and Digital Techniques*, accepted for publication in 2004.

3. B. Das and Swapna Banerjee, "Inertial Snake for Contour Detection in Ultrasonography Images", *IEE Proc.- Vision, Image and Signal Processing*, accepted for publication in 2004.

4. B. Das and Swapna Banerjee, "A Unified CORDIC-based Chip to Realize DFT/DHT/DCT/DST", *IEE Proc.- Computers and Digital Techniques*, vol. 149, no. 4, pp. 121—127, Jul. 2002.

Refereed Conference Papers

1. B. Das and Swapna Banerjee, "Homogeneity Induced Inertial Snake with Application to Medical Image Segmentation", *Proc. IEEE Symposium on Computer-Based Medical Systems*, Jun. 24-25, 2004, Bethesda, MD.

2. B. Das, P K. Saha and F. W Wehrli, "Object Class Uncertainty Induced Snake with Applications to Medical Image Segmentation", *Proc. SPIE Conf. On Medical Imaging*, Feb. 14-19, 2004, San Diego, CA.

3. B. Das and Swapna Banerjee, "A Low Complexity Architecture for Complex Discrete Wavelet Transform", *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Proc,* Apr. 6–10, 2003, vol. II, pp. 309-312, Hong Kong, China.

4. B. Das and Swapna Banerjee, "A Novel RAM Architecture for Bit-Plane Based Coding", *Proc. IEEE Conf. on Data Compression,* Mar. 25-27, 2003, pp. 421, Snowbird, UT.

5. B. Das and Swapna Banerjee, "A Memory Efficient 3-D DWT Architecture", *Proc. IEEE Int. Conf. on VLSI and Embedded Systems Design*, Jan. 4-8, 2003, pp. 208-213, New Delhi, India.

6. B. Das and Swapna Banerjee, "Low Power Architecture of Running 3-D Wavelet Transform for Medical Imaging Application", *Proc. IEEE Int. Conf. of the Eng. in Medicine and Biology Soc. and the Biomedical Eng. Soc.*, Oct. 23-26, 2002, vol. II, pp. 1062-1063, Houston, TX, USA.

7. B. Das and Swapna Banerjee, "VLSI Architecture for a New Real-time 3D Wavelet Transform", *Proc. IEEE Int. Conf. on Acoustics, Speech, and Signal Proc.*, May 13–17, 2002, vol. III, pp. 3224-3227, Orlando, FL, USA.

8. B. Das and Swapna Banerjee, "A Smart Diagnostic System for Doppler Ultrasonography", *Proc. IEEE/EMBS Annual N.E. Bio-Eng. Conf.*, Apr. 20–21, 2002, pp. 275–276, Philadelphia, PA, USA.

9. B. Das and Swapna Banerjee, "A Wavelet Based Low Complexity Embedded Block Coding Algorithm", *Proc. IEEE Int. Conf. on Data Comp. (DCC)*, Apr. 2–4, 2002, pp. 452, Snowbird, USA.

10. B. Das and Swapna Banerjee, "A CORDIC Based Array Architecture for Complex Discrete Wavelet Transform", *Proc. ACM Int. Great Lakes Symp. on VLSI*, Mar.22–23, 2001, pp.79–84, Purdue, USA

11. B. Das and Swapna Banerjee, "An Improved Active Contour Model", *Proc. IEEE Int. Conf. On Computers, Comm. and Devices*, Dec. 14–16, 2000, pp. 441–444, IIT Kharagpur, India.

12. B. Das, S.K. Mitra and Swapna Banerjee, "Knowledge Based System for Diagnostic Assessment of Doppler Spectrogram", *Proc. AAAI/IJCAI Int. Conf. on Artificial Intelligence*, Apr. 10–14, 2000, pp. 405–416, Acapulco, Mexico.

13. B. Das and Swapna Banerjee, "Clinical Assessment of Doppler Spectrogram Using Artificial Neural Networks", *Proc. Symp. On Biomedical Engineering and Nuclear Medicine*, Jan. 24–29, 2000, Bhaba Atomic Research Center, Trombay, Mumbai, India.

14. B. Das and Swapna Banerjee, "Knowledge Based Doppler Blood Velocimeter System", *Proc. IEEE Int. Conf. On Knowledge-Based Intelligent Electronic Systems*, Apr. 21–23, 1998, vol. 3, pp. 334–339, Adelaide, Australia.

Patents Filed:

1. VLSI Based Low Cost Doppler Ultrasonography System, filed at IIT Kharagpur, India.

2. Knowledge Based Automated Diagnostic System for Doppler Ultrasonography, filed at IIT Kharagpur, India.

Skills:
High-level languages: C, C++, VC++, VHDL, Verilog, Spice
Operating systems: Unix, Dos, Windows 95/98/NT, Linux, Sun Solaris, Silicon Graphics
Design automation tools: Xilinx FPGA, Viewlogic, Synopsys, Cadence, Sea of gates (OCEAN)
Scripting languages: csh, ksh, Bourne
Algorithm development environments: MATLAB
Software development tools: Makefiles, Source code control, Debuggers
Hardware: Spectrum analyzer, Digital oscilloscope, Function generator

Honors:
1. 1994 Best Performance in Physics, College exhibition, R.K.M. Vidyamandira, Calcutta.
2. 1991 State Merit Scholarship for West Bengal Council of Higher Secondary Education.
3. 1989 State Merit Scholarship for West Bengal Board of Secondary Education Examination.

Relevant Courses: CAD of VLSI, Digital Signal Processing, Multimedia Systems, Artificial Intelligence, Analog and Digital Circuits, Analog and Digital Communication, Solid State Physics, Mathematical Physics, Classical and Quantum Mechanics, Electromagnetic Theory

Interests and Activities: Hobbies include reading, football, dramatics, fine arts, music and creative writing.

Country of Citizenship: India, ***Visa Status:*** J1