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Academic Qualification

B. Tech, Computer Science and Engineering

Indian Institute of Technology (IIT), Guwahati, India (2003-2007)

- Cumulative Performance Index = **7.05 / 10** (*After 7 semesters*)
- Defect Tolerance Strategies in Nanoelectronic Circuits (*Dissertation*)

Research Experience

Invited Research Intern, University of Bristol, United Kingdom (*May-July 2006*)

- Defect Tolerance in Nanotechnology Switches
- Guides – **Prof. Dhiraj K. Pradhan**
Dept. of Computer Science and Engineering, University of Bristol, UK
Prof. Ahmad Al-Yamani
Asst. Director, Center for Reliable Computing (CRC), Stanford University, USA

Research Project, Indian Institute of Technology, Guwahati, India

- On Reliability Analysis of Forward Loop Forward Hop Networks (*December 2005*)
- On Fault Tolerance of Two-Dimensional Mesh Networks (*May-July 2005*)
- Guides – **Prof. Soumen Maity**, Dept. of Mathematics, IIT, Guwahati, India
Prof. Amiya Nayak
School of Information Technology and Engineering (SITE)
University of Ottawa, Ontario, Canada

Summer Project, Indian Institute of Technology, Guwahati, India (*May-July 2005*)

- Prospects of Divide and Conquer Strategy to Find Minimum Spanning Tree of Planar Graphs
- Guide – **Prof. Pinaki Mitra**, Dept. of Computer Science and Engineering, IIT, Guwahati, India

Research Interests

- Fault Tolerant Computing
- Robust System Design for Emerging Nanotechnologies
- Design and Analysis of Algorithms

Scholarships Awarded

Prathibha Scholarship, Government of Andhra Pradesh, India (*2003-Present*)

- Awarded to the students selected through the IIT-Joint Entrance Exam (IIT JEE)

Publications AND Research Proposals

Research Proposal

- “Algorithmic Issues in Emerging Nano Architectures”, Submitted to Engineering and Physical Sciences Research Council (**EPSRC**), **UK** by Prof. Dhiraj K. Pradhan

Refereed Journal Papers

- Soumen Maity, Amiya Nayak and **S. Ramsundar**, “Characterization, Testing and Reconfiguration of Faults in Mesh Networks”, **Integration: The VLSI journal**.
Status: To Appear
- **S. Ramsundar**, Ahmad Al-Yamani and Dhiraj K. Pradhan, “ A Defect Tolerant Scheme for Nanotechnology Circuits”, Special Issue on Nanoelectronic Circuits and Nanoarchitectures in **IEEE Trans. On Circuits and Systems**.
Status: Submitted September 2006

Refereed Conference Papers

- Soumen Maity, Amiya Nayak and **S. Ramsundar**, “On the Fault Tolerance of Two Dimensional Mesh Networks”, Proceedings of the 8th International Conference on Distributed Computing and Networking (**ICDCN 2006**), Guwahati, India, December 2006.
Status: Accepted as regular paper
- Soumen Maity and **S. Ramsundar**, “On the Reliability Analysis of Forward Loop Forward Hop Networks”, Proceedings of the 3rd International Conference on Distributed Computing and Internet Technologies (**ICDCIT 2006**), Bhubhaneshwar, India, December 2006.
Status: Accepted as regular paper
- **S. Ramsundar**, Ahmad Al-Yamani and Dhiraj K. Pradhan, “Defect Tolerance in Nanotechnology Switches Using a Greedy Reconfiguration Algorithm”, **IEEE 8th International Symposium on Quality Electronic Design (ISQED 2007)**, San Jose, CA, USA, March 2007. *Status: Accepted as regular paper*

Workshop Papers

- Costas Argyrides, **S. Ramsundar**, Ahmad Al-Yamani and Dhiraj K. Pradhan, “Non-square Meshes for Improved Yield in Nanotechnology Circuits”, 8th **IEEE Latin - American Test Workshop (LATW 2007)**, Cuzco, Peru, March 11 - 14, 2007. *Status: Accepted as long paper*

Achievements

- **Only student** to be selected from IIT Guwahati for Summer internship at Trilogy India Ltd. for the period of May-July, 2006. The selection was based on a written test followed by a technical interview.
- One of the 3 students to represent IIT Guwahati at **ACM ICPC (International Collegiate Programming Contest)** for Asia region held at Kolkata, India, November 2005. The selection was based on numerous programming contest held within IIT Guwahati.
- Ranked among the top 1% students in the Joint Entrance Examination (160,000 students appeared for the examination) in 2003 for the admission to the B. Tech program at IIT.

Undergraduate Thesis

S. Ramsundar, “Defect Tolerance Strategies in Nanoelectronic circuits”, Department of Computer Science and Engineering, IIT Guwahati. Advisor: Prof. Pinaki Mitra, *In Progress*, August 2006 - April 2007.

Major Projects Completed

- Fault tolerance techniques for emerging nanoelectronic circuits (*May-July 2006*)
 - The optimal reconfiguration of nanoelectronic mesh is known to be NP-complete. An efficient near optimal reconfiguration algorithm for the problem was proposed. **The algorithm offers an average switch density improvement of 50% to 100 % to most recently published techniques.** The simulation was done in C++ on Linux platform.
 - Extensive analysis was done to compare the results of the proposed algorithm and the most recently published techniques.
 - A research proposal for further research in emerging nanoelectronic circuits was submitted to **EPSRC, UK.**

Supervisors

- Prof. **Dhiraj K. Pradhan**, Dept. of Computer Science, **University of Bristol, UK**
- Prof. **Ahmad Al-Yamani**, Asst. Director CRC, **Stanford University, USA**

- On the reliability of mesh and ring networks (*May-December 2005*)
 - Two dimensional mesh network of processing elements was considered and the reconfiguration capability of the network was thoroughly analyzed for various link configurations. In case of bidirectional links, optimal reconfiguration was found to be NP-complete, for other link configurations efficient algorithms were found.
 - Some bounds on the reconfiguration capability of Forward Loop Forward Hop (FLFH) networks were found. Efficient reconfiguration strategy for generalized FLFH networks were devised.

Supervisors

- Prof. **Soumen Maity**, Dept. of Mathematics, **IIT, Guwahati, India**
- Prof. **Amiya Nayak**, SITE, **University of Ottawa, Ontario, Canada**

- Divide and Conquer Strategy for Minimum Spanning Tree of Planar Graphs (*May-July 2005*)
 - Different divide and Conquer approaches were tried for planar graphs. The graph was initially divided by the famous planar separator into parts before finding their individual MST's. Various strategies to merge the resulting MST's were tried, but the resulting time complexities were unfavorable.

Supervisor

- Prof. **Pinaki Mitra**, Dept. of Computer Science and Engg., **IIT, Guwahati, India**

- Design and implementation for the automation of records and maintenance of guest house at IIT Guwahati (*January-April 2005*)
 - We were a group of 10 students. We designed the system using rational rose and the implementation was done on Windows platform in Visual Basic.

Supervisor - Prof. **P. K. Das**, Dept. of Computer Science and Engineering., **IIT, Guwahati**

Programming and Software Skills

Programming Languages	Very well versed in C, C++ on linux and windows platforms.
Operating Systems	Windows XP, Redhat Linux 9.0
Scripting Languages	Average skills in Bash, Perl

Activities

- Served as the computer secretary of Kapili Hostel, IIT Guwahati (academic year 2004-05)
- Organized a C/C++ based game programming contest for successive years in Techniche 2005 and 06 (The technical festival of IIT Guwahati)
- Organizer and regular participant of mock ACM programming contest for IIT Guwahati students
- Conducted workshop on Standard Template Library for the computer science students of IIT Guwahati.

References

Prof. Dhiraj K. Pradhan
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Univeristy of Bristol, UK

Email: pradhan@cs.bris.ac.uk

Prof. Ahmad Al-Yamani
Asst. Director Center for Reliable Computing
Stanford University, USA

Email: aaa@ieee.org

Prof. Soumen Maity
Department of Mathematics
Indian Institute of Technology (IIT)
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