Sandeep Dasgupta

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Research Interest

Program Analysis & Verification
Compiler Optimizations
Parallel Computing
Programming Language Design & Implementation
High performance computing
Automated software verification & quality assurance.

Academics

PhD Computer Science
CS @ Illinois Urbana Champaign

- Currently working with LLVM Group led by Prof. Vikram S. Adve

M.Tech Computer Science & Engineering – CPI 9.00/10.00 *June 2011*
Indian Institute Of Technology Kanpur, Kanpur, India.

- Secured **rank** 1 in M. Tech 2009 Batch, IIT Kanpur.

B.E. Computer Science & Engineering – *First Class with Honours*, 85.625/100.00 *June 2006*
Bengal Engineering & Science University, Shibpur, West Bengal, India.

- Awarded **University Gold Medal** for securing 1st Rank in BE, Computer Science & Engineering, 2002 batch.
- Awarded **Best Student Award**, sponsored by Tata Consultancy Services, for outstanding performance in BE, Computer Science & Engineering, 2002 batch.

M.Tech Thesis — Joint supervision of Dr. Amey karkare & Dr. Sanjeev K Aggarwal

Precise Shape Analysis Using Field Sensitivity

To disambiguate heap allocated data-structures by estimating the shape (Tree, Dag or Cyclic Graph) of the data structure accessible from each heap directed pointer. This will help in automatic parallelization of sequential code having heap intensive data structures. The work mainly focuses on devising a novel shape analysis technique.

Publications

Papers in Conferences

- Sandeep Dasgupta & Amey Karkare. "**Precise shape analysis using field sensitivity**", in *Proceedings of the 27th Annual ACM Symposium on Applied Computing*, SAC 2012, pages 1300-1307, New York, USA. ACM. doi: 10.1145/2231936.2231982, isbn: 978-1-4503-0857-1.
- Barnali Basak, Sandeep Dasgupta & Amey Karkare. "**Heap Dependence Analysis for Sequential Programs**", *International Conference on Parallel Computing* (ParCo 2011), Ghent, Belgium, August 30 - September 2, 2011.
  - Published in: Applications, Tools and Techniques on the Road to Exascale Computing, 22 volume of Advances in Parallel Computing, chapter: Heap Dependence Analysis for Sequential Programs, pages 99–106. IOS Press, May 2012. doi: 10.3233/978-1-61499-041-3-99, isbn: 978-1-61499-040-6.

Posters

- Poster "**Dependence Analysis for Parallelization of Sequential Programs**" got accepted at APLAS'10 (the 8th ASIAN Symposium on Programming Languages & Systems).

Journals

- Sandeep Dasgupta, Amey Karkare & P. Vinay K. Reddy. "**Precise shape analysis using field sensitivity**.", in *Innovations in Systems and Software Engineering (ISSE)*, a NASA journal. doi: 10.1007/s11334-013-0198-7

Professional Experience

Intel Technology India Pvt. Ltd., *Component Design Engineer* *August 2011 - Present*

- Work on design automation problems related to formal equivalence verification (FEV) of hardware designs.
- Build flows and methodologies to provide solutions to formally verify leading next generation CPU designs.

Interra Systems India Pvt. Ltd., *Senior Member Of Technical Staff* *August 2006 - July 2009*

- Developer of Interra's premiere front-end analyzer products - Cheetah (SystemVerilog) and MVV(Mixed Verilog Vhdl) and provided support for several new constructs of System Verilog IEEE-1800-2005, fixed tool bugs, created applications and contributed in performance Improvement.
- Involved in a critical service project for Atrenta (I) Pvt. Ltd. for the development of System Verilog features in Spyglass DFT.

Teaching Experience

Indian Institute of Technology, Kanpur, *August 2009 - 2011*

- **Tutor** for ESc 101: Fundamentals of Computing: An undergraduate course.
  - Responsible for weekly lecture class on C - programming language, supervision of programming laboratory and grading assignments and term examinations.
- **Teaching Assistant** for CS 335: Principles of Compiler Design: An undergraduate course.
  - Responsible for mentoring a student group on a course project of developing a simple compiler (using a subset of C-language constructs) demonstrating most of the phases of compiler design starting from Lexical & Syntax analysis upto Intermediate code generation.
  - Grading assignments and term examinations.
- **Teaching Assistant** for CS355: Programming Tools and Techniques: An undergraduate course.
  - Grading assignments related to Software management tools such as make; Programming tools such as Python, Perl; Document preparation systems such as tex; Tools for building programs like Lex and Yacc.

Achievements/Distinctions

- Awarded **University Gold Medal** for securing 1st Rank in BE, Computer Science & Engineering, 2002 batch.
- Awarded **Best Student Award**, sponsored by Tata Consultancy Services, for outstanding performance in BE, Computer Science & Engineering, 2002 batch.
- **Secured Rank** 1, in M. Tech 2009 Batch, IIT Kanpur.
- **Secured All India Rank** 145 (99.64 percentile) in GATE 2009, an exam for admission in Graduate Study.
- **Ranked** 356^{th} (among 1 Lakh+ students) in WB-JEE, 2002, an exam for admission in undergraduate study.
- Awarded **Interra Humming Bird Award** in recognition of & appreciation for providing excellent support to Atrenta (I) Pvt. Ltd. in the project "IEEE compliance for Spyglass", awarded by Interra Systems India Pvt. Ltd.