

Ashutosh Mahajan
200, West Packer Avenue
Bethlehem, PA-18015

email: asm4@lehigh.edu
phone: 484-358-6637
web: <http://coral.ie.lehigh.edu/~asm4>

Education

- **Lehigh University** 2003 - Present
PhD student, Industrial and Systems Engineering (ISE), GPA 3.82/4.00,
Primary Field: Optimization, Minor: Mathematics,
Thesis: Advances in branch-and-cut algorithms for Mixed Integer Linear Programming,
Advisor: Dr. Ted Ralphs.
- **Indian Institute of Technology, Delhi, India** 1999 - 2003
B.Tech (Hons.), Production and Industrial Engineering, GPA 8.10/10.00,
Thesis: A variable cost, demand and supply transportation model for LG Electronics.

Work Experience

- **Graduate Research Assistant** May 2008 - Present
Industrial and Systems Engineering, Lehigh University
- Worked on theoretical and computational aspects of generating useful disjunctions for branching and generating valid inequalities for Mixed Integer Linear Programs.
- **Graduate Research Assistant** May 2007 - August 2007
Operations Research R & D, SAS Institute
- Implemented algorithms for solving approximately, large Minimum Cost Multi-commodity Flow Problems using potential function based methods.
- Implemented heuristics for solving the Travelling Salesperson's Problem.
- **High Performance Computing (HPC) Graduate Assistant** July 2006 - May 2008
Library and Technology Services, Lehigh University
- Provided support for setup, administration and maintenance of several High Performance Computing resources at Lehigh University including clusters and SMP machines. Also helped with troubleshooting, user support and documentation.
- **Graduate Research Assistant** August 2005 - July 2006
SAS Institute and Industrial and Systems Engineering, Lehigh University
- Developed and implemented primal heuristics for Mixed Integer Linear Programs (MILPs).
- Performed computational experiments for testing and comparing these methods over large sets of MILP instances by using distributed computing.
- **Systems Administrator** August 2004 - Present
COR@L Lab, Industrial and Systems Engineering, Lehigh University
- Setup over 80 machines with different architectures and configurations.
- Installed and managed different optimization software and tools including XPRESS, CPLEX, COIN-OR, MOSEL, GAMS, AMPL, MATLAB, Mathematica, Maple etc. for more than 50 students and faculty in the department.
- Setup parallel and distributed environments like Condor and MPI.
- Installed and managed source code repositories, bug-tracking software, mailing lists and the COR@L website.

- **Teaching Assistant** August 2003 - May 2004
 Industrial and Systems Engineering, Lehigh University
 - Taught, graded or held office hours and/or lab sessions for various courses: Introduction to Mathematical Programming (IE406), Introduction to Engineering (Engr05), Algorithms in Systems Engineering (IE170), Production Analysis (IE168), Production and Inventory Control (IE251).

- **Summer Intern** May - July 2002
 Heavy Vehicles Factory, Avadi, Chennai (India)
 Developed the complete process and scheduling plan for manufacturing the final carrier assembly of the side gearbox of T-90 Main Battle Tank.

Publications

1. A. Mahajan and T.K. Ralphs, On complexity of selecting general branching hyperplanes for maximizing lower bounds for mixed integer programs, Working Paper.
2. A. Mahajan and T.K. Ralphs, Experiments with Branching on General Hyperplanes, Submitted to 11th Informs Computing Society Conference, 2008.

Talks

1. A. Mahajan and T. Ralphs, On selecting general branching hyperplanes for mixed integer programs, INFORMS Annual Conference, Washington DC, October, 2008.
2. A. Mahajan and T. Ralphs, SYMPHONY: A Mixed Integer Programming Solver, INFORMS Annual Conference, Washington DC, October, 2008.
3. T. Ralphs, M. Guzelsoy, S. Oshkai and A. Mahajan, Warm Starting for Mixed Integer Linear Programs, INFORMS Annual Conference, Seattle, WA, November, 2007.

Software Development

- Current developer of SYMPHONY MILP solver. Implemented new and improved existing methods for primal heuristics, preprocessing, branching and management of valid inequalities.
- Extensive development experience with commercial and open-source software in modelling and optimization: COIN, XPRESS, CPLEX, AMPL, etc.
- Coding experience in C, C++, Java (Basic), Fortran (Basic), MATLAB (Basic), Perl, Python, BASH, HTML, Javascript, LaTeX.
- In-depth knowledge of Linux-based operating systems. Experience in using and managing Condor, PVM and MPI for parallel and distributed computing. Working knowledge of Solaris, Mac and Windows operating systems.

Memberships and Professional Activities

- Associate Member, Common Infrastructure for Operations Research (COIN-OR).

- Member, Beta Pi Chapter of Phi Beta Delta (Honor Society for International Scholars).
- Member, Institute for Operations Research and the Management Sciences (INFORMS) and INFORMS Computing Society (ICS).
- Co-ordinator, Technical Paper Sessions, Tryst-2002, IIT-Delhi Technical Festival.
- Class-convener, Production and Industrial Engineering, IIT-Delhi, 2001-02 and 2002-03.

Scholarships and awards

- Listed in Who's Who in America, 2008.
- National Top 1% in Physics Olympiad, India, 1999.
- National Talent Search Scholarship, India, 1999 (awarded to 750 meritorious students nation-wide).
- Certificate of Merit, AISSE, India, 1997 (awarded to top 1% students nation-wide).

References

Available on request.