Srikrishna Sridhar, Graduate student

Computer Sciences, University of Wisconsin-Madison

Contact: srikris@cs.wisc.edu

Research
My research focuses on developing tools and algorithms for large scale problems in mathematical optimization, statistical computing and data analysis.

Contact
4241, Wisconsin Institutes for Discovery, University of Wisconsin-Madison

Education

University of Wisconsin, Madison   2013 (Expected)
Ph.D Computer Sciences
GPA 3.85/4

University of Wisconsin, Madison   2012
M.S, Computer Sciences
GPA 3.85/4

Birla Institute of Technology and Science (BITS) Pilani , India   2009
B.E(Hons) Computer Science
GPA 9.55/10

Interests
Numerical optimization, Statistical computing, Parallel computing, Data management, Computational mathematics.

Publications

Locally ideal formulations for piecewise linear functions with indicator variables.
Srikrishna Sridhar, Jeff Linderoth, James Luedtke (OR Letters Submitted 2013)
We proposed strong mixed integer programming formulations for piecewise linear functions that are required to be evaluated when a binary variable is turned on. We show that our formulations, in the absence of other constraints, perfectly model the problem under consideration. Additionally, our formulations were on average 40x faster than previous approaches.

Financial Benefits of HIE Participation: An Operations Research Approach
Srikrishna Sridhar, Patricia Brennan, Stephen Wright, Stephen Robinson (JAMIA 2012)
We developed a mathematical model to quantify the financial consequences of Health information exchanges on insurance companies, HMOs and health care providers.

Channel Assignment in Multi-Radio WMN's : A Graph-Theoretic Approach
Srikrishna Sridhar, Jun Guo, Sanjay Jha (IEEE-COMSNETS 2009)
We developed and tested algorithms to optimally assign channels to radio interfaces in a multi-radio, multi-channel wireless mesh networks. We demonstrated that our scalable algorithms minimize overall network interference on networks with thousands of nodes.

Completed Projects

New Models for Production Planning Problems with Increasing Byproducts.
with Jeff Linderoth, James Luedtke
We developed novel convex relaxations for production planning processes involving desirable products and undesirable by-products. Our models are more accurate and easier to solve in comparison with past approaches.

Optimal business-to-business (b2b) product design
with Siddharth Barman, Shrihari Sridhar, Roger Calantone
Developed computational tools to help b2b operations suppliers choose product offerings that best serve the needs of the market, given the firm's cost constrains.

Current Projects	**Software for solving large scale linear and quadratic programs.**
	with Victor Bittorf, Christopher Re, Stephen Wright
	We are developing a massively parallel linear and quadratic programming solver to tackle optimization problem spanning terabytes of data. Our solver can be applied to common machine learning tasks like support vector machines, matrix completion etc.
Technical Skills	**Languages**: Python, C, C++, SQL
	Scientific Tools: GAMS, MatLab, AIMMS, AMPL, R
	Web Frameworks: Django, HTML, CSS, PHP
Experience	**Intern, EMC** **May-Sep 2012**
	Developed scalable and parallel solvers to run statistical regression on multi-gigabyte data sets. Our solvers now run on Greenplum powered clusters using MADlib, an open-source library for scalable in-database analytics.
	Intern, University of New South Wales, Sydney **Jun-Dec 2009**
	with Dr. Jun Guo, Prof. Sanjay Jha
	Developed algorithms for assigning channels to radio interfaces in multi-radio, multi-channel wireless mesh networks.
	Intern, Indian Institute of Science, Bangalore **Jun-Aug 2007**
	with Prof. Umapathy, Dept. of Organic Chemistry
	Automated an advanced laser application facility through a remotely controlled centralized computing system.
Software	**Primetime!**
	Developed a DNA search tool that helps biologists at the University of Wisconsin-Madison choose the best DNA template that contains the DNA target region to be amplified. A task that used to take them hours can now be done in seconds.
	PickMe!
	Developed a student-project assignment tool that matches up students to projects based on their skills, experience and desire to work with certain colleagues. This tool is currently used by graduate level courses for software engineering at the University of Wisconsin-Madison.
Press Coverage	Two of Wisconsin's leading political journals Medical Economics and Wispolitics highlighted the importance of our JAMIA paper!
Invited Talks	**Production planning models with Increasing by-products.**
	Optimization and Analytics: New Frontiers in Theory and Practice - The Fourth INFORMS Optimization Society Conference
	University of Miami, February 24 2012.
	Discrete choice non-linear models for chemical engineering applications.
	Systems, Information, Learning and Optimization (SILO) seminar series
	University of Wisconsin-Madison, February 1 2012.
	Engineering applications of discrete optimization
	Graduate research seminar series at the Wisconsin Institutes for Discovery
	University of Wisconsin-Madison, February 16 2012.
	Grad School life: From a PhD angle
	Alumni Research Talks 2012
	Birla Institute of Technology and Science, Pilani India, January 15 2012.

Posters	**New models for production planning problems with increasing byproducts** with Jeff Linderoth, James Luedtke Mixed Integer Programming Workshop, University of California-Davis, July 2012 **Optimizing financial effects of HIE: A multi-party linear programming approach** with Patricia Brennan, Stephen Wright, Stephen Robinson WARF Discovery Challenge, University of Wisconsin-Madison, May 2012
Graduate Coursework	**Optimization**: Linear & Non-Linear Optimization, Stochastic & Integer Programming **Statistics**: Statistical Computing, Mathematical Statistics, Regression analysis **Computing**: Methods of Computational Mathematics, Econometrics

Awards & Honors

- Selected by 3-Day startup as one of Madison's 40 young entrepreneurs in 2011.
- BITS-Pilani outstanding undergraduate award 2005, 2006.
  Description : Awarded bi-annually to 10 students with outstanding academic records.
- National level award for the Indian National Informatics Olympiad 2003.
- National level award for the Indian National Mathematics Olympiad 2005.
- 6th rank at the National Talent Search Exam (NTSE) 2003.
- CBSE (Central Board of Secondary Education) merit scholar 2005
  Description: Awarded to 400 outstanding students (out of 3 lakh nationwide) undergraduate freshmen.

References

- Stephen Wright, University of Wisconsin-Madison (swright@cs.wisc.edu)
- Jeff Linderoth, University of Wisconsin-Madison (linderoth@wisc.edu)
- Sundar Balasubramaniam, BITS-Pilani (sundarb@bits-pilani.ac.in)
- Sanjay Jha, Networking Research Labs, UNSW Sydney (sjha@cse.unsw.edu.au)