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EDUCATION **Carnegie Mellon University**, Pittsburgh, PA **August 2006 to May 2010**

Ph.D. in Algorithms, Combinatorics and Optimization (ACO).

- Dissertation Topic: *Corner Polyhedra and Maximal Lattice-free Convex Sets : A Geometric Approach to Cutting Planes*
- Advisor: Prof. Gerard Cornuejols

Stony Brook University, Stony Brook, New York **August 2004 to May 2006**

M.S., Computer Science.

- Thesis Title : *Distributed Localization with Noisy Distance and Angle Information*
- Advisor : Prof. Joe Mitchell

Indian Institute of Technology, Delhi, India **August 2000 to May 2004**

B.Tech., Computer Science and Engineering.

WORK EXPERIENCE **Dept. of Mathematics, University of California, Davis** **July 2010 - present**

Currently appointed as Krener Assistant Professor.

AT&T Shannon Labs-Research, Florham Park, NJ **May to July 2005**

Worked as an intern on Graph Embedding problems. Work done with Emden Gansner.

INRIA, Sophia-Antipolis, France **May to July, 2003**

Worked as an intern on compilation which preserved security types. Work done with Gilles Barthe and Tamara Rezk.

RESEARCH PAPERS **Papers under review**

The Triangle Closure is a Polyhedron,
submitted to Mathematical Programming Ser. A,
Joint Work with Robert Hildebrand and Matthias Köppe

A $(k + 1)$ -Slope Theorem for the k -Dimensional Infinite Group Relaxation,
submitted to SIAM Journal on Optimization,
Joint Work with Robert Hilderband, Matthias Köppe and Marco Molinaro

Algorithmic and Complexity Results for Cuts from Maximal Lattice-Free Convex Sets,
submitted to Mathematical Programming Ser. A,
Joint Work with Robert Hilderband and Matthias Köppe

Papers published/in press in refereed Journals and Conference Proceedings

Unique Lifting of Integer Variables in Minimal Inequalities,
to appear in Mathematical Programming Ser. A,
Joint Work with Manoel Campelo, Michele Conforti, Gérard Cornuéjols and G. Zambelli

A Counterexample to a Conjecture of Gomory and Johnson,
to appear in Mathematical Programming Ser. A, DOI: 10.1007/s10107-010-0407-1,
Joint work with Michele Conforti, Gérard Cornuéjols and Giacomo Zambelli

Unique Minimal Liftings for Simplicial Polytopes,
to appear in Mathematics of Operations Research,
Joint work with Gérard Cornuéjols and Matthias Koeppel

Intersection Cuts with Infinite Split Rank,
Mathematics of Operations Research, vol. 37 (1), 2012, 21–40,
Joint work with Gérard Cornuéjols and Francois Margot

A Probabilistic Analysis of the Strength of Split and Triangle Closures,
Proceedings of IPCO 2011, New York, LNCS 6655 (2011), 27–38
Joint work with Gérard Cornuéjols and Marco Molinaro

Experiments with two-row cuts from degenerate tableaux,
INFORMS Journal of Computing, vol. 23(4), 2011, 578–590,
Joint work with Pierre Bonami, Gérard Cornuéjols and Francois Margot

Convex Sets and Minimal Sublinear Functions,
Journal of Convex Analysis, vol. 18(2), 2011, 427–432,
Joint work with Gérard Cornuéjols and Giacomo Zambelli

On the Relative Strength of Split, Triangle and Quadrilateral Cuts,
Mathematical Programming Ser. A, vol. 126 (2), 2011, 281–314. (Preliminary version in
Proc. Symposium on Discrete algorithms (SODA), New York, January 2009),
Joint work with Pierre Bonami, Gérard Cornuéjols and Francois Margot

Maximal Lattice-free convex sets in linear subspaces,
Mathematics of Operations Research, vol. 35(3), 2010, 704–720,
Joint work with Michele Conforti, Gérard Cornuéjols and Giacomo Zambelli

Minimal Inequalities for an Infinite Relaxation of Integer Programs,
SIAM Journal on Discrete Mathematics, vol. 24(1), 2010, 158–168,
Joint work with Michele Conforti, Gérard Cornuéjols and Giacomo Zambelli

On Lifting Integer Variables in Minimal Inequalities,
Proceedings of IPCO 2010, Lausanne, LNCS 6080 (2010), 85–95,
Joint work with Manoel Campelo, Michele Conforti, Gérard Cornuéjols and Giacomo Zambelli

Geometric Algorithms for Optimal Airspace Design and Air Traffic Controller Workload Balancing,
ACM Journal on Experimental Algorithmics 14, 2009, 2.3–2.28. (Preliminary version in
Proc. ALENEX 2008),
Joint work with Joe Mitchell and Girishkumar Sabhnani

Distributed Localization using Noisy Distance and Angle Information,
Preliminary version in Proc. of the Seventh ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc'06), 262–273, Florence, Italy, May 2006,
Joint work with Jie Gao, Joe Mitchell and Girishkumar Sabhnani

Security types preserving compilation,
Computer Languages, Systems and Structures 33, 2, July 2007, 35-59,
Joint work with Gilles Barthe and Tamara Rezk

WORKING PAPERS Approximating the Corner Polyhedron with K-cuts,
In Preparation with Marco Molinaro

Maximal Lattice-free Convex Sets in 3 Dimensions,
Manuscript with Gérard Cornuéjols and Francois Margot

Steiner Point Removal in Graph Metrics,
Manuscript with Anupam Gupta

HONORS AND
AWARDS

- *Gerald P. Thompson Award*, awarded by the Tepper School of Business, CMU for the best doctoral dissertation, 2010.
- *Egon Balas Award*, awarded by the Tepper School of Business, CMU for the best student paper in the area of operations research, 2008.
- *William Larimer Mellon Fellowship*, Tepper School of Business, 2006-2009.
- *Presidential Fellowship*, Stony Brook University, 2004.
- Gold medal at Indian National Physics Olympiad, 2000.
- *National Talent Search Scholar*, awarded by the National Council of Education, Research and Training (NCERT), India, 1998.

GRANTS

- *AMS-Simons Travel Grant*, awarded by the *American Mathematical Society (AMS)* with support provided by the *Simons Foundation*, 2011-2013.
- Mini grant awarded for leading a *Research Focus Group* as part of the *NSF funded VIGRE program grant* awarded to Dept. of Mathematics, UC Davis, 2010-2011.

INVITED TALKS

- Invited Talk on Mixed-Integer Programming at *International Symposium on Mathematical Programming (ISMP)*, Berlin, Germany, 2012.
- A $(k + 1)$ -slope theorem for the Infinite Group Problem, *Bay Area Discrete Mathematics (BADMath) conference*, University of California, Davis, October 2011.
- Unique Minimal Liftings for Minimal Inequalities, *Mixed Integer Programming (MIP) conference*, University of Waterloo, Ontario, Canada, June 2011.
- Recent Trends in Cutting Planes for Mixed-Integer Linear Programs, *Discrete Optimization Workshop, Program on Optimization and its Applications at Institute for Pure and Applied Mathematics (IPAM)*, UCLA, Los Angeles, California, October 2010.
- Intersection Cuts with Infinite Split Rank, *INFORMS*, Austin, Texas, 2010.
- Convex Sets and Minimal Sublinear Functions, *INFORMS*, Austin, Texas, 2010.
- On Lifting Integer Variables in Minimal Inequalities, *INFORMS*, Austin, Texas, 2010, *Workshop on Multi-row Cuts*, Bertinoro, Italy, November 2009.
- A Counterexample to a Conjecture of Gomory and Johnson, *International Symposium on Mathematical Programming (ISMP)*, Chicago, USA, August 2009.
- On the Relative Strength of Two Row Cuts for MILPs, *INFORMS*, San Diego, USA, 2009.
- Corner Polyhedra and Maximal Lattice-free Sets : A Geometric Approach to Cutting Plane Theory, *INFORMS*, San Diego, USA, 2009.

PROFESSIONAL
SERVICE

Chair of the local organization committee for the conference *Mixed Integer Programming (MIP) 2012* held at *UC Davis*.

Review Work and Technical Referee for the following journals : *Mathematics of Operations Research, Mathematical Programming, SIAM Journal on Optimization, SIAM Journal on Discrete Mathematics, European Journal of Operational Research, Operations Research Letters, International Journal of Computational Geometry and Applications.*

TEACHING
EXPERIENCE

Instructor

- **MAT 17B: Calculus for Biology and Medicine**, Fall 2011 at UC Davis.
This is the second course in the calculus series offered to biology majors at UC Davis.
Overall Teaching Evaluation : 4.5/5.0.
- **MAT 16B: Short Calculus II**, Spring 2011 at UC Davis.
This is the second course in the entry-level calculus series offered at UC Davis.
Overall Teaching Evaluation : 4.5/5.0.
- **MAT 16C: Short Calculus III**, Spring 2011 at UC Davis.
This is the third and final course in the entry-level calculus series offered at UC Davis.
Overall Teaching Evaluation : 4.1/5.0.
- I co-taught **Advanced Integer Programming** (with Gérard Cornuéjols) at Carnegie Mellon University in Spring 2010. This is a core course for PhD students in the Operations Research and ACO programs at CMU. More details/lecture notes at : <http://www.math.ucdavis.edu/~abasu/teaching.html>
- I have led a *Research Focus Group (RFG)* under the framework of the NSF-funded VIGRE program in the Department of Mathematics at UC Davis for the 2011-2012 academic year. This involved running regular research seminars, mini courses and workshops over the course of the 2010-2011 academic session, focused towards applications of convex geometry. Duties involved giving expository lectures to a group of 10-15 mathematics PhD students and faculty, organizing presentations by participants and outside speakers, holding discussions and encouraging motivated PhD students to attack open problems. More details/lecture notes can be found at : <http://www.math.ucdavis.edu/~abasu>

Teaching Assistant

I have been a teaching assistant for the following MBA courses at Tepper School of Business. Duties included shared administrative responsibilities with faculty instructor, holding recitations, holding office hours, designing and grading homeworks and exams.

- Probability and Decision Making (Fall 2008, Spring 2009, Fall 2009, Spring 2010).
- Optimization and Decision Making (Fall 2007).

I have also been a teaching assistant for the following undergraduate classes at Stony Brook University. Duties included holding recitations, office hours, designing and grading homeworks and exams.

- Foundations of Computer Science.
- Analysis of Algorithms.
- Computer Science I.

REFERENCES

PROF. GÉRARD CORNUÉJOLS
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Phone: (412) 268-2284
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