

# **Prof. Dr. Raymond Hemmecke**

## **Combinatorial Optimization**

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## **Curriculum vitae**

**December 2010**

## Education

1979–1987	Polytechnical school in Köllda
1987–1991	Specialized school for mathematics and nat. sciences in Erfurt
06/1991	Degree: Abitur
08/1991–10/1992	Civil service
10/1992–09/1994	Study, major: mathematics, minor: computer sciences University of Leipzig
10/1994–06/1995	Study, major: mathematics, minor: computer sciences University of Sussex at Brighton (UK)
07/1996–12/1997	Study, major: mathematics, minor: computer sciences University of Leipzig
12/1997	Degree “Diplom-Mathematiker”, University of Leipzig
09/2001	Degree “Dr. rer. nat.”, University of Duisburg
12/2006	Habilitation in mathematics, Degree “Dr. rer. nat. habil.” Otto-von-Guericke-University Magdeburg

## Scientific experience

12/1997–08/1998	Scientific researcher, University of Leipzig, Institute of Mathematics and Computer sciences,
09/1998–06/2001	Scientific researcher, University of Duisburg, Department of Mathematics and Computer sciences,
07/2001–06/2002	PostGraduate Researcher, University of California, Davis, Center for Image Processing and Industrial Computing (CIPIC),
07/2002–12/2003	Visiting Research Assistant Professor, University of California, Davis, Department of Mathematics,
02/2004–09/2008	Scientific assistant (C1), Otto-von-Guericke-University Magdeburg, Institute for Mathematical Optimization,
10/2008–09/2008	Substituting professor for Algorithmic Discrete Mathematics Technische Universität Darmstadt, Department of Mathematics
10/2009–11/2009	Substituting professor for Combinatorial Optimization Technische Universität Munich, Department of Mathematics
11/2009–	Professor for Combinatorial Optimization Technische Universität Munich, Department of Mathematics

## Teaching experience

Fall 2002	Short Calculus	Davis, CA, USA
Winter 2003	Linear Algebra	Davis, CA, USA
Spring 2003	Linear Algebra	Davis, CA, USA
	Mathematical Programming	Davis, CA, USA
Fall 2003	Integral Calculus	Davis, CA, USA
SS 2004	Computer oriented Mathematics	Magdeburg
WS 2004/05	Linear Optimization	Magdeburg
SS 2005	Computer oriented Mathematics	Magdeburg
WS 2005/06	Integral bases	Magdeburg
SS 2006	Computer oriented Mathematics	Magdeburg
	Short rational generating functions	Magdeburg
SS 2007	Computer oriented Mathematics	Magdeburg
WS 2007/08	Gröbner bases	Magdeburg
SS 2008	Linear Optimization	Magdeburg
WS 2008/09	Algorithmic Geometry	Darmstadt
	Linear Algebra for Physicists I	Darmstadt
SS 2009	Linear Algebra for Physicists II	Darmstadt
	Algorithmic Discrete Mathematics	Darmstadt
	Integer Programming in fixed Dimension	Darmstadt
WS 2009/10	Introduction to Discrete Optimization	Munich
SS 2010	Discrete Optimization	Munich
	Geometric and Algebraic Methods in Integer Programming	Munich
WS 2010/11	Algorithmic Discrete Mathematics	Munich
	Combinatorial Optimization	Munich

## Grants

- 2003 Faculty Research Grant, UC Davis  
“Algebraic and geometric techniques for the automatic computation of counting formulas”  
with Jesus De Loera (UC Davis)
- 2010 Banff International Research Station (BIRS) Focused Research Group  
“Nonlinear Discrete Optimization”  
with Jesus De Loera (UC Davis), Matthias Köppe (UC Davis), Jon Lee (IBM), Shmuel Onn (Technion Haifa), Robert Weismantel (ETH Zurich)

## Prizes

- 2010 2nd prize, “UTIA Best 2010 Paper competition”, UTIA Prague  
R. Hemmecke, M. Studený and J. Vomlel.  
A geometric view on learning Bayesian network structures.  
*International Journal of Approximate Reasoning* **51** (2010), 573–586.

## Organized Workshops

- 2008 Model Selection Day, Magdeburg, [www.model-selection-day.de](http://www.model-selection-day.de)
- 2009 Model Selection Day, Darmstadt, [www.model-selection-day.de](http://www.model-selection-day.de)
- 2011 Workshop “Combinatorial Optimization, Statistics, and Applications”,  
Munich, [www.cosa-workshop.de](http://www.cosa-workshop.de)

## Mentored theses

- 3 mentored and completed diploma theses (University of Magdeburg, TU Darmstadt)
- 11 mentored and completed Bachelor theses (TU Munich)
- 1 “Jugend-forscht”-Project  
2006, M. Walter: “Solving linear Diophantine systems of equations and inequalities”

## Software Development

- 4ti2      Software-Package for algebraic, geometric and combinatorial problems  
in linear spaces  
<http://www.4ti2.de>  
(jointly with M. Köppe, P. Malkin und M. Walter)
- LattE      Software-Package to count lattice points in rational polyhedra and to  
compute Hilbert series  
<http://www.math.ucdavis.edu/~latte>  
(jointly with J. DeLoera, D. Haws, P. Huggins, M. Köppe, J. Tauzer und  
R. Yoshida)

## Invited talks and Courses

- 10/2002      “Hilbert bases”  
Fifth Biannual Bay Area Discrete Math Day, Berkeley
- 12/2004      “Test sets in integer programming: recent developments”  
Workshop “Randomness, Geometry, and Counting”, Berlin
- 08/2005      “Effective computation of Gröbner bases and Markov bases of toric ideals”  
Conference “Theoretical Effectivity and Practical Effectivity of Gröbner Bases”,  
Tokyo
- 10/2006      “4ti2–Computation of Hilbert bases, Graver bases, toric Gröbner bases and  
more”  
Workshop “Software for Algebraic Geometry”, IMA, Minneapolis
- 05-06/2007      Mini-Kurs “Representations of lattice point sets”  
(Pre)Doc Course “Integer Points in Polyhedra”, Berlin
- 06/2009      “Optimality Certificates, N-fold IPs and Nash Equilibria”  
Mixed Integer Programming Workshop Series, MIP 2009, Berkeley

## Refereeing experience

Since 1999 I have been active as a referee for a variety of international journals, for example:

- Journal of Symbolic Computation
- Discrete Mathematics

- Discrete Optimization
- Journal of Discrete Applied Mathematics
- Mathematical Programming
- SIAM Journal on Optimization
- Mathematical Methods of Operations Research
- Operations Research Letters
- Mathematical Research Letters
- European Journal of Operational Research
- Annals of Combinatorics
- Australasian Journal of Combinatorics
- Journal of Multivariate Analysis
- Journal on Linear Algebra and its Applications
- Ann. Inst. Statist. Math.
- International Journal of Approximate Reasoning
- Information Processing Letters

## References

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