

## MOSEK related publications

August 19, 2011



# Chapter 1

## The MOSEK software and algorithms

Several research papers have been written which discuss the algorithms employed in MOSEK. Below is a list of those papers.

1. E. D. Andersen, C. Roos, and T. Terlaky. On implementing a primal-dual interior-point method for conic quadratic optimization. *Math. Programming*, 95(2), February 2003
2. E. D. Andersen. Certificates of primal and dual infeasibility in linear programming. *Computational Optimization and Applications*, 20(2):171–183, 2001
3. E. D. Andersen. On primal and dual infeasibility certificates in a homogeneous model for convex optimization. *SIAM J. on Optim.*, 11(2):380–388, 2000
4. E. D. Andersen and K. D. Andersen. The MOSEK interior point optimizer for linear programming: an implementation of the homogeneous algorithm. In H. Frenk, K. Roos, T. Terlaky, and S. Zhang, editors, *High Performance Optimization*, pages 197–232. Kluwer Academic Publishers, 2000
5. E. D. Andersen. On exploiting problem structure in a basis identification procedure for linear programming. *INFORMS Journal on Computing*, 11(1):95–103, 1999
6. E. D. Andersen and Y. Ye. On a homogeneous algorithm for the monotone complementarity problem. *Math. Programming*, 84(2):375–399, February 1999
7. E. D. Andersen and Y. Ye. A computational study of the homogeneous algorithm for large-scale convex optimization. *Computational Optimization and Applications*, 10:243–269, 1998

8. E. D. Andersen and Y. Ye. Combining interior-point and pivoting algorithms. *Management Sci.*, 42(12):1719–1731, December 1996
9. K. D. Andersen. A Modified Schur Complement Method for Handling Dense Columns in Interior-Point Methods for Linear Programming. *ACM Trans. Math. Software*, 22(3):348–356, 1996
10. E. D. Andersen and K. D. Andersen. Presolving in linear programming. *Math. Programming*, 71(2):221–245, 1995
11. E. D. Andersen. Finding all linearly dependent rows in large-scale linear programming. *Optimization Methods and Software*, 6:219–227, 1995

## Chapter 2

# Applications involving MOSEK

In this chapter a number publications that employs MOSEK are listed.

### 2.1 Engineering

1. Malorie Trillat, Joseph Pastor, and Pascal Francescato. Yield criterion for porous media with spherical voids. *Mech. Res. Comm.*, 33:320–328, 2006
2. Malorie Trillat and Joseph Pastor. Limit analysis and Gurson’s model. *European J. of Mech. and Solids*, 24:800–819, 2005
3. Tao Luo, David Newmark, and David Z. Pan. A new lp based incremental timing driven placement for high performance designs. In Ellen M. Sentovich, editor, *Proceedings of the 43rd annual conference on Design automation*, 2006
4. Rabih A. Jabr. Modeling network losses using quadratic cones. *IEEE Trans. Power Systems*, 20:505–506, 2005
5. Rabih A. Jabr and Zouk Mosbeh. Radial distribution load flow using conic programming. *IEEE Trans. Power Systems*, 21:1458– 1459, 2006

### 2.2 Computer science

1. L. Springborn Kharevych and B. Schröder. Discrete conformal mappings via circle patterns. To appear in *ACM Transactions on Graphics*, 2006

### 2.3 Finance

1. M. Koivu, T. Pennanen, and A. Ranne. Modeling assets and liabilities of a Finnish pension company: a VEqC approach. *Scand. Actuar. J.*, pages 46–76, 2005
2. T.F. Coleman S. Alexander and Y. Li. Minimizing CVaR and VaR for a portfolio of derivatives. *J. Banking & Finance*, 30:583–605, 2006

### 2.4 Other

1. David Craft, Tarek Halabi, and Thomas Bortfeld. Exploration of trade-offs in intensity-modulated radiotherapy. *Physics in medicine & biology*, 50:5857–5868, 2005
2. A. Makrodimopoulos and A. Martin. A novel formulation of upper bound limit analysis as a second-order cone programming problem. In R. J. Owen E. Onate, editor, *Proc. 8th Int. Conf. on Computational Plasticity*, 2005

### 2.5 Image analysis

1. Martin Heiler. *Image models for segmentation and recognition*. PhD thesis, Universitat Mannheim, 2006. Available at [http://deposit.ddb.de/cgi-bin/dokserv?idn=980735653&dok\\_var=d1&dok\\_ext=pdf&filename=980735653.pdf](http://deposit.ddb.de/cgi-bin/dokserv?idn=980735653&dok_var=d1&dok_ext=pdf&filename=980735653.pdf)

### 2.6 Machine learning

1. Martin Heiler and Christoph Schnorr. Learning sparse matrix representations by non-negative matrix factorization and sequential cone programming. *Journal on Machine Learning*, 7:1385–1407, 2006. Available at <http://jmlr.csail.mit.edu/papers/volume7/heiler06a/heiler06a.pdf>

## Chapter 3

# Publications of general interest

### 3.1 Convex optimization

1. Stephen Boyd and Lieven Vandenberghe. *Convex optimization*. Cambridge University Press, 2004. <http://www.stanford.edu/~boyd/cvxbook/>
2. A. Ben-Tal and A Nemirovski. *Lectures on Modern Convex Optimization: Analysis, Algorithms, and Engineering Applications*. MPS/SIAM Series on Optimization. SIAM, 2001

### 3.2 Conic quadratic optimization

1. F. Alizadeh and D. Goldfarb. Second-order cone programming. *Math. Programming*, 95(1):3–51, 2003

### 3.3 Integer optimization

1. D. Bertsimas and R. Weismantel. *Optimization over integers*. Dynamic Ideas, 2005. <http://www.dynamic-ideas.com>
2. L. A. Wolsey. *Integer programming*. John Wiley and Sons, 1998

### 3.4 Portfolio optimization

A large number of the MOSEK users employs for financial applications.

1. Gerard Cornuejols and Reha Tütüncü. *Optimization methods in finance*. Cambridge University Press, New York, 2007

2. M. S. Lobo and M. Fazel, and S. Boyd. Portfolio optimization with linear and fixed transaction costs. Technical report, CDS, California Institute of Technology, 2005. To appear in Annals of Operations Research. <http://www.cds.caltech.edu/~maryam/portfolio.html>
3. Bernd Scherer. *Portfolio construction and risk budgeting*. Risk Books, 2 edition, 2004



## Chapter 4

# Courses using MOSEK

### 4.1 2007

- Computational Optimization at University of British Columbia
- Image reconstruction course at Rice University
- Advanced VLSI Circuit Design at Stanford University

### 4.2 2006

- Image reconstruction course at Rice University