

SHAONING HAN

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RESEARCH INTERESTS

Mixed-integer programming, Nonsmooth optimization, Sparse learning, Conic programming, Machine learning, Large-scale optimization

ACADEMIC EMPLOYMENT

Postdoctoral researcher, University of Southern California, 2023
• Advisor: Jong-Shi Pang

EDUCATION

Ph.D in Industrial and Systems Engineering, University of Southern California, 2022
• Advisor: Andrés Gómez
B.S. in Mathematics, University of Science and Technology of China, 2017

PUBLICATIONS

1. He, Z., Han, S., Gómez, A., Cui, Y., and Pang, J.-S. (2023). Comparing solution paths of sparse quadratic minimization with a Stieltjes matrix. *Mathematical Programming*
2. Han, S., Gómez, A., and Atamtürk, A. (2023a). 2×2 -convexifications for convex quadratic optimization with indicator variables. *Mathematical Programming*
3. Pang, J.-S. and Han, S. (2022). Some strongly polynomially solvable convex quadratic programs with bounded variables. *SIAM Journal on Optimization (Forthcoming)*
4. Han, S., Gómez, A., and Atamtürk, A. (2022a). The equivalence of optimal perspective formulation and Shor's SDP for quadratic programs with indicator variables. *Operations Research Letters*, 50(2):195–198
5. Han, S., Gómez, A., and Prokopyev, O. A. (2022c). Fractional 0-1 programming and submodularity. *Journal of Global Optimization*
6. Atamtürk, A., Gómez, A., and Han, S. (2021). Sparse and smooth signal estimation: Convexification of ℓ_0 -formulations. *Journal of Machine Learning Research*, 22(52):1–43

PREPRINTS

1. Han, S. and Gómez, A. (2021a). Compact extended formulations for low-rank functions with indicator variables. *Major Revision at Mathematics of Operations Research*

2. Han, S., Zhang, X., and Pang, J.-S. (2023b). On the number of pivots of Dantzig's simplex methods for linear and convex quadratic programs. *Major Revision at Operations Research Letters*
3. Han, S., Gómez, A., and Pang, J.-S. (2022b). On polynomial-time solvability of combinatorial Markov random fields. *Submitted*
4. Han, S. and Pang, J.-S. (2022). Continuous selections of solutions to parametric variational inequalities. *Submitted*
5. Han, S. and Gómez, A. (2021b). Single-neuron convexifications for binarized neural networks. *Technical Report*

TEACHING EXPERIENCE

- **ISE 599 (PhD) Mixed-Integer Programming**
Teaching assistant, University of Southern California, 2021 Spring
- **ISE 530 (MS) Optimization Methods for Analytics**
Teaching assistant, University of Southern California, 2019 Fall
- **ENGR 0020 (BS) Probability and Statistics for Engineers**
Teaching assistant, University of Southern California, 2019 Spring
- **ENGR 0020 (BS) Probability and Statistics for Engineers**
Teaching assistant, University of Pittsburgh, 2018 Fall
- **ENGR 0020 (BS) Probability and Statistics for Engineers**
Teaching assistant, University of Pittsburgh, 2018 Spring
- **IE 2086 (MS) Decision Models**
Teaching assistant, University of Pittsburgh, 2017 Fall

INVITED TALKS

- *Mixed-binary convex quadratic optimization and its applications in inference with sparsity.* The Academy of Mathematics and Systems Science (AMSS) of the Chinese Academy of Sciences, March 2023
- *On polynomial-time solvability of combinatorial Markov random fields.* INFORMS Annual Meeting, Indianapolis, IN, October 2022
- *Convexification for low-rank functions with indicator variables.* International Conference on Continuous Optimization, Bethlehem, PA, July 2022
- *Strongly polynomial algorithm for box-constrained quadratic programs with H_0 -matrix.* INFORMS Optimization Society Conference, Greenville, SC, March 2022
- *Fractional 0-1 programming and submodularity.* INFORMS Annual Meeting, Anaheim, CA, October 2021
- *On SDP formulations for quadratic optimization with indicator variables.* INFORMS Annual Meeting, virtual, November 2020

**PROFESSIONAL Journal/Conference Reviewer
ACTIVITIES**

- Mathematical Programming, SIAM Journal on Optimization, Mathematics of Operations Research, Journal of Global Optimization, Optimization Letters, IPCO 2023

Invited Session Chair

- TBD in nonsmooth optimization, 2023 INFORMS Annual Meeting, Phoenix, AZ, October 2023
- TBD in global optimization, 2023 INFORMS Annual Meeting, Phoenix, AZ, October 2023
- Algorithms for discrete optimization problems, 2022 INFORMS Optimization Society Conference, Greenville, SC, March 2022

Member

- INFORMS 2018 - Present
- INFORMS Optimization Society 2018 - Present

**VOLUNTEER
EXPERIENCE**

Virtual volunteer at INFORMS Annual Meeting, Anaheim, CA, October 2021. Responsible for five rooms during one shift day to ensure the smooth progress of meetings.

SKILLS

Python, Matlab, Julia, PyTorch, Gurobi, Mosek