

SHUAI SHAO

University of Wisconsin-Madison, Madison, WI 53706, USA

Email: sh@cs.wisc.edu

<http://pages.cs.wisc.edu/~sh>

EDUCATION

University of Wisconsin-Madison (UW-Madison) Sept. 2015 - present

- Ph.D. Student, Advisor: Jin-Yi Cai
- M.A. in Mathematics
- M.S. in Computer Sciences

University of Science and Technology of China (USTC) Aug. 2010 - June 2014

- B.Sc. in Mathematics, HUA Loo-Keng Talent Program (Honors Program)

ACADEMIC EXPERIENCE

Lab of Electromagnetic Space Information, USTC & Chinese Academy of Sciences (CAS)

- Research Intern, Advisor: Honggang Hu July 2014 - June 2015

Academy of Mathematics and Systems Science, CAS

- Visiting Student Sept. 2013 - June 2014

RESEARCH INTERESTS

Computational Complexity Theory, Information Theory.

RESEARCH ARTICLES

Unless specified otherwise, authors are listed in alphabetical order.

1. New Planar P-time Six-Vertex Models and a Complete Complexity Classification
Jin-Yi Cai, Zhiguo Fu and Shuai Shao
In submission.
2. A Dichotomy for Real Boolean Holant Problems
Shuai Shao and Jin-Yi Cai
IEEE Symposium on Foundations of Computer Science (FOCS) 2020, to appear.
3. Beyond #CSP: A Dichotomy for Counting Weighted Eulerian Orientations with ARS
Jin-Yi Cai, Zhiguo Fu and Shuai Shao
Information and Computation, in press.
4. Contraction: A Unified Perspective of Correlation Decay and Zero-Freeness of 2-Spin Systems
Shuai Shao and Yuxin Sun
International Colloquium on Automata, Languages and Programming (ICALP) 2020.
5. From Holant to Quantum Entanglement and Back
Jin-Yi Cai, Zhiguo Fu and Shuai Shao
International Colloquium on Automata, Languages and Programming (ICALP) 2020.

6. On the Dual of the Coulter-Matthews Bent Functions
 Honggang Hu, Qingsheng Zhang and Shuai Shao³
IEEE Transactions on Information Theory, vol. 63, pp. 2454 - 2463, 2017.
7. The Proof of Lin's Conjecture via the Decimation-Hadamard Transform
 Honggang Hu, Shuai Shao², Guang Gong and Tor Helleseth
IEEE Transactions on Information Theory, vol. 60, pp. 5054 - 5064, 2014.
 Preliminary version: *IEEE International Symposium on Information Theory (ISIT)* 2014.

INVITED TALKS

- On the Complexity of Holant Problems
- Theory Seminar, Institute of Software, CAS Jan. 2020
 - The 4th Shenzhou Forum, Harbin Institute of Technology Dec. 2019
- Complexity Classification of Six-Vertex Models
- China Theory Week, Tsinghua University Sept. 2018

TEACHING EXPERIENCE

- Instructor: Advanced Computer Science for High School Students, UW-Madison Summer 2018
- Teaching Assistant: Numerical Linear Algebra, UW-Madison Spring 2019
- Teaching Assistant: Introduction to Algorithms, UW-Madison Fall 2018, Summer 2017
- Teaching Assistant: Numerical Methods, UW-Madison Fall 2017, Fall & Spring 2016, Fall 2015
- Teaching Assistant: Linear Algebra, USTC Spring 2013

AWARDS & HONORS

- Chinese Graduate Student TA Award, UW-Madison 2019
- Departmental Summer RA Award, UW-Madison 2016
- National Elite Program in Fundamental Sciences Fellowship, USTC 2011 - 2014
- Bachelor's Thesis Prize (top 5%), USTC 2014
- National Undergraduate Innovation Project Prize (top 5%), USTC 2014
- Undergraduate Research Project Prize (top 5%), USTC 2013
- First Prize in Chinese Undergraduates Math Contest, Chinese Mathematical Society (CMS) 2012
- First Prize in Chinese High School Students Mathematics Contest, CMS 2009