

# Ahmad Mousavi

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## Education

- **University of Minnesota** Minneapolis, MN  
*Industrial Postdoctoral Fellow at Institute for Mathematics and its Applications* 2019-Present
- **University of Maryland, Baltimore County** Baltimore, MD  
*Ph.D. in Applied Mathematics (GPA: 4.00/4.00)* 2013 - 2019
  - Advisor: Prof. Jinglai Shen
  - Thesis topic: Topics in Sparse Recovery via Constrained Optimization: Least Sparsity, Solution Uniqueness, and Constrained Exact Recovery
- **University of Maryland, Baltimore County** Baltimore, MD  
*M.S. in Applied Mathematics (GPA: 4.00/4.00)* 2013 - 2015
- **Sharif University of Technology** Tehran, Iran  
*M.S. in Applied Mathematics (GPA: 18.18/20)* 2008 - 2011
- **The University of Guilan** Rasht, Iran  
*B.S. in Applied Mathematics (GPA: 16.93/20)* 2004-2008

## Research Interests

- General: Sparse Optimization, Large Scale Optimization, Machine Learning, Mathematical Modeling, and Numerical Linear Algebra.
- Specific (not restricted to):  $\ell_1$ -Minimization, Greedy Algorithms, Semidefinite Programming, Inexact Newton's Methods, Matrix Decomposition, and so on.

## Publications

- JINGLAI SHEN AND SEYEDAHMAD MOUSAVI. Least Sparsity of  $p$ -norm based Optimization Problems with  $p > 1$ , SIAM Journal on Optimization, Volume 28(3), pp. 2721-2751, 2018, <https://epubs.siam.org/doi/10.1137/17M1140066>.
- SEYEDAHMAD MOUSAVI AND JINGLAI SHEN. Solution Uniqueness of Convex Piecewise Affine Functions Based Optimization with Applications to Constrained  $\ell_1$  Minimization, ESAIM: Control, Optimisation, and Calculus of Variations, Volume 25, p. 56, 2019, <https://www.esaim-cocv.org/articles/cocv/abs/2019/01/cocv180023/cocv180023.html>.
- SEYEDAHMAD MOUSAVI, MOHAMMAD MEHDI REZAEI TAGHIABADI, AND RAMIN AYAN-ZADEH. A Survey on Compressive Sensing: Classical Results and Recent Advancements, Journal of Mathematical Modeling, Vol. 8, No. 3, 2020, pp. 309-344. [https://jmm.guilan.ac.ir/article\\_4155.html](https://jmm.guilan.ac.ir/article_4155.html).

- SEYEDAHMAD MOUSAVI, ZHEMING GAO, LANSHAN HAN, AND ALVIN LIM. Quadratic Surface Support Vector Machine with L1 Norm Regularization, arXiv, 2019, Revised version submitted to Journal of Industrial and Management Optimization, <https://arxiv.org/abs/1908.08616>.
- JINGLAI SHEN AND SEYEDAHMAD MOUSAVI. Exact Support and Vector Recovery of Constrained Sparse Vectors via Constrained Matching Pursuit, arXiv, 2019, <https://arxiv.org/abs/1903.07236>.
- RAMIN AYANZADEH, SEYEDAHMAD MOUSAVI, MILTON HALEM AND TIM FININ. Quantum Annealing Based Binary Compressive Sensing with Matrix Uncertainty, arXiv, 2019, <https://arxiv.org/abs/1901.00088>.
- SAI POPURI, NAGARAJ NEERCHAL, AMITA MEHTA AND AHMAD MOUSAVI. Density Estimation using Entropy Maximization for Semi-continuous Data, arXiv, 2020, <https://arxiv.org/abs/2011.08475>.
- HASSAN REZAPOUR, RAMIN NASIRI, AND SEYEDAHMAD MOUSAVI. The Hyper-Zagreb Index of Trees and Unicyclic Graphs, Iranian Journal of Mathematical Sciences and Informatics, Accepted to be Published, (arXiv, 2018, <https://arxiv.org/abs/1808.10441>).
- HASSAN REZAPOUR, SEYEDAHMAD MOUSAVI. Probability and Statistics (A Comprehensive Book for M.S. Nationwide Examination in Economics and Management Fields, Sobhan-e Mehr Publication, 2013, In Farsi).

## Honors and Awards

- Industrial Postdoctoral Fellowship, Institute for Mathematics and its Applications (IMA), University of Minnesota.
- Outstanding Graduate Research Award in Mathematics, College of Natural and Mathematical Sciences, UMBC, 2019.
- Lodging Support to Attend Foundation of Data Science Summer School, Georgia Institute of Technology, 2019.
- Full Graduate Assistantship from Department of Mathematics and Statistics, University of Maryland, Baltimore County, 2013-2019.
- ICERM Travel and Lodging Support to Attend Optimization Methods in Computer Vision and Image Processing Workshop, Providence, Rhode Island, USA, 2019.
- ICERM Lodging Support to Attend Computational Imaging Workshop, Providence, Rhode Island, USA, 2019.
- SIAM Student Travel Award to Attend SIAM Annual Meeting, Portland, Oregon, USA, 2018.
- UMBC Graduate School Professional Development Grant to Attend SIAM Annual Meeting, 2018, Portland, Oregon, USA.
- UMBC Graduate School Professional Development Grant to Attend Optimization Methods in Computer Vision and Image Processing Workshop, Providence, Rhode Island, USA, 2019.
- Ranked 13th in Nationwide Entrance Examination for Ph.D. Program in Mathematics, Iran, April 2011.

- Ranked 16th among 10763 Participants in the Nationwide Entrance Examination for M.S. Program in Mathematics, Iran, February 2008.
- Ranked 4th among Fellow M.S. Students in Applied Mathematics, Department of Mathematical Sciences, Sharif University of Technology.
- Ranked 1st among Fellow B.S. Students, Faculty of Mathematical Sciences, The University of Guilan.
- Accepted with Full Reimbursement for Autumn School Algorithmic Optimization, Trier University, 2016 (However, I could not attend).

## Work Experience

- Research and Development Intern, Precima, R&D division, Chicago, IL, Summer 2019.

## Conference and Workshops Presentation and Attendance

- (Presentation) Some Topics in Sparse Optimization, <http://www.norbertwiener.umd.edu/seminars/>, The Norbert Wiener Center, University of Maryland, College Park, MD, 2018.
- (Presentation) Solution Uniqueness of Convex Piecewise Affine Functions Based Optimization with Applications to Constrained  $\ell_1$  Minimization, [http://meetings.siam.org/sess/dsp\\_programsess.cfm?SESSIONCODE=65264](http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=65264), SIAM Annual Meeting, Portland, OR, 2018.
- (Poster Presentation) Solution Uniqueness of Convex Piecewise Affine Functions Based Optimization with Applications to Constrained  $\ell_1$  Minimization. Princeton Day of Optimization, 2018, ICERM Computational Imaging Workshop, 2019, and ICERM Optimization Methods in Computer Vision and Image Processing Workshop, 2019.
- (Presentation) A Mathematical Introduction to Compressive Sensing, University of Maryland, Baltimore County, Optimization Seminar, Baltimore, MD, 2016.
- (Attendance) Workshop on Intersections between Control, Learning, and Optimization, UCLA, Los Angeles, CA., 2019.
- (Attendance) SIAM Annual Meeting, Pittsburgh, PA, 2017.
- (Attendance) American Mathematical Society Spring Eastern Sectional Meeting, Baltimore, MD, 2014.
- Attendance: 3rd and 4th International Conference of Iranian Operations Research Society, Tehran and Rasht, Iran, May 2010 and 2011.
- (Attendance) 3rd and 4th Workshop on Optimization and its Applications, Tehran, Iran, 2011 and 2012.
- (Attendance) 40th Annual Iranian Mathematics Conference, Tehran, Iran, 2009.

## Teaching Experience

- Instructor at University of Maryland, Baltimore County.
  - MATH 225: Introduction to Differential Equations, Summer and Winter 2018, and Winter 2019.

- Instructor at Islamic Azad University.
  - Numerical Computations: Spring 2016.
- Teaching Assistant at University of Maryland, Baltimore County.
  - MATH 152: Calculus and Analytic Geometry II, Fall 2014, Spring 2015, Fall 2015, Fall 2016, Spring 2017, Summer 2017.
  - MATH 151: Calculus and Analytic Geometry I, Summer 2015, Fall 2017, Fall 2018.
  - MATH 155: Applied Calculus, Spring 2014.
- Teaching Assistant at Sharif University of Technology.
  - Introduction to Differential Equations, Spring 2008, Fall 2009.

### Other Scientific Activities

- Reviewed for many scientific journals such as Signal Processing, Journal of Optimization Theory and Applications, Optimization Methods and Software, Digital Signal Processing, Physica A: Statistical Mechanics and its Applications, Mathematical Problems in Engineering, and so on.

### Service

- Vice President of Mathematics and Statistics Graduate Student Association (MSGSA) at University of Maryland, Baltimore County, 2015.
- Orientation Advisor at UMBC in Summer 2017.

### Miscellaneous

- **Computer Skills:** MATLAB, Python, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office.
- **Memberships:** Society for Industrial and Applied Mathematics (SIAM), Iranian Operations Research Society.

### References

- Hui Zou: Professor at University of Minnesota, School of Statistics, zouxx019@umn.edu
- Shuzhong Zhang: Professor at University of Minnesota, Industrial and Systems Engineering, zhangs@umn.edu
- Jinglai Shen: Professor at University of Maryland, Baltimore County, Department of Mathematics and Statistics, shenj@umbc.edu
- Florian Potra: Professor at University of Maryland, Baltimore County, Department of Mathematics and Statistics, potra@umbc.edu
- Muddappa Seetharama Gowda: Professor at University of Maryland, Baltimore County, Department of Mathematics and Statistics, gowda@umbc.edu
- Muruhan Rathinam: Professor at University of Maryland, Baltimore County, Department of Mathematics and Statistics, muruhan@umbc.edu
- Maziar Salahi: Professor at The Univesisty of Guilan, Faculty of Mathematical Sciences, salahim@guilan.ac.ir