ABOLFAZL HASHEMI

CONTACT INFORMATION

- Address: 1 University Station C0803, Austin, TX 78712-0240
- Email: abolfazl@utexas.edu
- Homepage: https://abolfazlh.github.io
- Google Scholar: https://scholar.google.com/citations?user=Se7mocgAAAAJ&hl=en
- GitHub: https://github.com/realabolfazl
- LinkedIn: https://www.linkedin.com/in/abolfazlh
- ResearchGate: https://www.researchgate.net/profile/Abolfazl_Hashemi2

EDUCATION

Doctor of Philosophy (Ph.D.), Electrical Engineering — June 2016–August 2020 (expected)
University of Texas at Austin, Austin, Texas, USA
Adviser: Prof. Haris Vikalo, GPA: 4.0/4.0

Master of Science in Engineering (M.S.E.), Electrical Engineering — August 2014–May 2016
University of Texas at Austin, Austin, Texas, USA
Adviser: Prof. Haris Vikalo, GPA: 3.89/4.0

Bachelor of Science (B.S.), Electrical Engineering — September 2010–July 2014
Sharif University of Technology, Tehran, Iran
Adviser: Prof. Babak H. Khalaj, GPA: 3.90/4.0

RESEARCH INTERESTS

- Convex and Nonconvex Optimization
- Signal and Information Processing
- Decision and Control
- Machine Learning

EXPERIENCES

University of Texas at Austin — August 2014-present

- Graduate Research Assistant: *Collaborative Sensing and Learning of Structured Data*
- Graduate Teaching Assistant, Statistical Machine Learning (Fall 2019), Digital Signal Processing (Fall 2014 and Spring 2015), Estimation Theory (Fall 2017)

Cognitive Scale, Austin, Texas — Summer 2017

- Data Scientist Intern: *Relation Extraction for clinical text data using Deep Neural Network.*

Hong Kong University of Science and Technology — Summer 2013

- Undergraduate Research Intern: *Performance analysis of robust estimators of Covariance matrices, Designed and developed simulations in MATLAB.*

Sharif University of Technology — September 2012-July 2014

- Undergraduate Research Assistant: *Developed a novel camera vision based Gait Analysis method exploiting human body-parts proportion.*

- Undergraduate Teaching Assistant: *Voluntarily teaching assistant positions for several courses in Electrical Engineering to help other students in their study to be prosperous throughout their education.*

SCHOLASTIC HONORS

1. One of four invited student speakers at 15th CSL student conference at UIUC, February 2020
   (Link: https://studentconference.csl.illinois.edu/overview/technical-sessions/tech-mlsp/)
2. ICML Travel Award, June 2019
3. One of five finalists for the best student paper award, American Control Conference, June 2018
4. American Control Conference Travel Award, June 2018
5. NSF Travel Award, August 2017
6. One of four invited student speakers at 12th CSL student conference at UIUC, selected from more than 100 abstract submissions, February 2017
   (Link: https://publish.illinois.edu/studentconference2017/speakers/invited-students/)
7. Professional Development Award, Office of Graduate Studies at UT Austin, December 2016, July 2019
8. IEEE Signal Processing Society Travel Award, September 2016
9. Inclusive Classrooms Leadership Certificate, UT Austin, February 2015
10. Professional Teaching Assistant Certificate, UT Austin, August 2014
11. Qualied as an Exceptional Talent eligible to enter Graduate Studies without entrance exam, Sharif University of Technology, December 2013
12. Ranked 79th among more than 277,000 participants in the Nationwide University Entrance Exam for B.Sc. degree, 2010.
13. Recipient of Iranian National Elite Foundation fellowship, 2010-2014

PUBLICATIONS

Preprints:

1. Ghasemi, M., Hashemi, A, Vikalo, H., Topcu, U., "Online Learning in Adversarial Markov Decision Processes: Some Regret Bounds," *Submitted*, 2020.
2. Hashemi, A, Vikalo, H., de Veciana, G., "Progressive Stochastic Greedy Sparse Reconstruction and Support Selection," *Submitted*, 2020.
   Link: https://arxiv.org/abs/1907.09064
3. Chen, Y., Hashemi, A., Vikalo, H., "Communication-Efficient Algorithms for Distributed Optimization Over Directed Graphs," *Submitted*, 2020.
4. Hashemi, A., Shafipour, R., Vikalo, H., Mateos, G., "Accelerated Sampling of Bandlimited Graph Signals," *Submitted*, 2019.
   Link: https://arxiv.org/abs/1807.07222

Journal Papers:

1. Hashemi, A., Ghasemi, M., Vikalo, H., Topcu, U., "Randomized greedy sensor selection: Leveraging weak submodularity," *IEEE Transactions on Automatic Control, To appear*, Jan. 2021.
   Link: https://arxiv.org/abs/1807.08627
2. Hashemi, A. and Vikalo, H., "Evolutionary Self-Expressive Models for Subspace Clustering," *IEEE Journal of Selected Topics in Signal Processing,* vol. 12, no. 6, pp. 1534–1546, Dec. 2018.
   Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8502063

3. Hashemi, A. and Vikalo, H., "Accelerated Orthogonal Least-Squares for Large-Scale Sparse Reconstruction," *Digital Signal Processing,* vol. 82, pp. 91–105, Nov. 2018.
Link: https://www.sciencedirect.com/science/article/pii/S1051200418305311

4. Hashemi, A., Zhu, B., Vikalo, H., "Sparse Tensor Decomposition for Haplotype Assembly of Diploids and Polyploids," *BMC Genomics,* vol. 19, no. 4, pp. 1–15, Mar. 2018.
Link: https://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-018-4551-y

Conference Papers:

1. Ghasemi, M., Hashemi, A., Vikalo, H., Topcu, U., "Identifying Low-Dimensional Structures in Markov Chains: A Nonnegative Matrix Factorization Approach," *American Control Conference (ACC),* Denver, CO, July 2020.
Link: https://arxiv.org/abs/1909.12898

2. Ghasemi, M., Hashemi, A., Vikalo, H., Topcu, U., "On Submodularity of Quadratic Observation Selection in Constrained Networked Sensing Systems," *American Control Conference (ACC),* Philadelphia, PA, July 2019.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8814899

3. Shafipour, R., Hashemi, A., Mateos, G., Vikalo, H., "Online topology inference from streaming stationary graph signals," *IEEE Data Science Workshop (DSW)*, Minneapolis, MN, June 2019.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8755560

4. Hashemi, A., Ghasemi, M., Vikalo, H., Topcu, U., "Submodular Observation Selection and Information Gathering for Quadratic Models," *International Conference on Machine Learning (ICML)*, Long Beach, CA, June 2019.
Link: http://proceedings.mlr.press/v97/hashemi19a/hashemi19a.pdf

5. Hashemi, A. and Vikalo, H., "Evolutionary Subspace Clustering: Discovering Structure In Self-expressive Time-series Data," *International Conference on Acoustic, Speech and Signal Processing (ICASSP),* UK, May 2019.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8682405

6. Consul, S., Hashemi, A., Vikalo, H., "A MAP Framework for Support Recovery of Sparse Signals Using Orthogonal Least Squares," *International Conference on Acoustic, Speech and Signal Processing (ICASSP),* Brighton, UK, May 2019.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8683151

7. Hashemi, A., Kilic, O.F., Vikalo, H., "Near-Optimal Distributed Estimation for a Network of Sensing Units Operating Under Communication Constraints," *Conference on Decision and Control (CDC),* Miami, FL, Dec. 2018.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8618717

8. Hashemi, A., Shafipour, R., Vikalo, H., Mateos, G., "A Novel Scheme for Support Identification and Iterative Sampling of Bandlimited Graph Signals," *Global Conference on Signal and Information Processing (GlobalSIP),* Anaheim, CA, Nov. 2018.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8646488

9. Hashemi, A., Ghasemi, M., Vikalo, H., Topcu, U., "A Randomized Greedy Algorithm for Near-Optimal Sensor Scheduling in Large-Scale Sensor Networks," *American Control Conference (ACC),* Milwaukee, WI, Jun. 2018.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8431563

10. Hashemi, A., Shafipour, R., Vikalo, H., Mateos, G., "Sampling and Reconstruction of Graph Signals via Weak Submodularity and Semidefinite Relaxation," *International Conference on Acoustic, Speech and Signal Processing (ICASSP),* Calgary, Alberta, Canada, Apr. 2018.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8461925

11. Hashemi, A. and Vikalo, H., "Sparse Recovery via Branch and Bound Least-Squares," *International Conference on Acoustic, Speech and Signal Processing (ICASSP),* New Orleans, LA, Mar. 2017.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7953060

12. Hashemi, A. and Vikalo, H., "Sparse Linear Regression via Generalized Orthogonal Least-Squares," *Global Conference on Signal and Information Processing (GlobalSIP),* Washington, DC, Dec. 2016.
Link: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7906052

Workshops:

1. Hashemi, A., Zhu, B., Vikalo, H., "Sparse Tensor Decomposition for Haplotype Assembly of Diploids and Polyploids," *The 4th International Workshop on Computational Network Biology: Modeling, Analysis, Control (CNB-MAC),* Boston, MA, Aug. 2017.

2. Hashemi, A., Zhu, B., Vikalo, H., "A Tensor Factorization Framework for Haplotype Assembly of Diploids and Polyploids," *RECOMB Satellite Workshop on Massively Parallel Sequencing,* Hong Kong, May 2017.

PRESENTATIONS

1. Weak Submodular Optimization: Theory, Algorithm, Application, *Department of Computer Science at UIUC*, Urbana-Champaign, Illinois, Feb. 2020.

2. Progressive Stochastic Greedy Sparse Reconstruction and Support Selection, *15th CSL student conference at UIUC*, Urbana-Champaign, Illinois, Feb. 2020.

3. Tutorial on Submodular Maximization, *The Oden Institute for Computational Engineering and Sciences at UT Austin*, Austin, TX, Nov. 2019.

4. Tutorial on Submodular Minimization, *The Oden Institute for Computational Engineering and Sciences at UT Austin*, Austin, TX, Oct. 2019.

5. Submodular Observation Selection and Information Gathering for Quadratic Models, *International Conference on Machine Learning (ICML)*, Long Beach, CA, June 2019.

6. Near-Optimal Distributed Estimation for a Network of Sensing Units Operating Under Communication Constraints," *Conference on Decision and Control (CDC),* Miami, FL, Dec. 2018.

7. A Randomized Greedy Algorithm for Near-Optimal Sensor Scheduling in Large-Scale Sensor Networks, *American Control Conference (ACC),* Milwaukee, WI, Jun. 2018.

8. Sparse Tensor Decomposition for Haplotype Assembly of Diploids and Polyploids, *12th CSL student conference at UIUC*, Urbana-Champaign, Illinois, Feb. 2017.

9. Sparse Linear Regression via Generalized Orthogonal Least-Squares, *Global Conference on Signal and Information Processing (GlobalSIP),* Washington, DC, Dec. 2016.

PROFESSIONAL MEMBERSHIPS AND SERVICES

Technical program committees:

1. The 21st IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)

2. The 14th International Multi-Conference on Computing in the Global Information Technology (ICCGI), Rome, Italy, 2019.

3. The 11th International Conference on Mobile, Hybrid, and Online Learning (eLmL), Athens, Greece, 2019.

4. The 12th International Conference on Advanced Engineering Computing and Applications in Sciences (ADVCOMP), Athens, Greece, 2018.

5. The 13th International Multi-Conference on Computing in the Global Information Technology (ICCGI), Venice, Italy, 2018.

Memberships:

- Institute of Electrical and Electronics Engineers (IEEE) 2016-present
- Member of Society for Industrial and Applied Mathematics (SIAM) 2016-present

Journal Reviews:

- IEEE Transactions on Signal Processing
- IEEE Transactions on Cybernetics
- IEEE Journal of Selected Areas in Information Theory
- IEEE Signal Processing Letters
- IEEE Transactions on Signal and Information Processing over Networks
- Elsevier Signal Processing
- IET Signal Processing
- Nature Scientific Reports
- PLOS One
- Taylor and Francis Journal on Forensic Sciences Research

Conference Reviews:

- SPAWC 2020, ICML 2020, ACC 2020, CDC 2018, eLmL 2019, ADVCOMP 2019, ICCGI 2018, ICCGI 2019

UNDERGRADUATE AND GRADUATE MENTORSHIP

- Ahmed Al Kurdestani (B.S.): First-order optimization methods for large-scale matrix completion
- Sara Abdi (B.S.): Efficient matrix and tensor completion models for study of sequencing data
- Banghua Zhu (B.S.): Sparse tensor decomposition for haplotype assembly
- Hussain Almattar (B.S.): Distributed vs. federated learning: Exploring the trade-offs in collaborative learning schemes
- Yiuye Chen (MSE): Distributed consensus and convex optimization over resource constrained networks

COMPUTER SKILLS

- Proficient in Python, MATLAB, C++ (past experience)
- Experienced in R, TensorFlow/Theano/Keras, Pyspark, Shell Scripting

REFERENCES

- Haris Vikalo
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  University of Texas at Austin
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