

## PROFESSIONAL EXPERIENCE

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- **University of Michigan** (Aug 2023-Present)  
Assistant Professor in Electrical and Computer Engineering
- **University of California, Riverside** (Feb. 2018–June 2023)  
Assistant Professor in Electrical and Computer Engineering  
Cooperating Faculty in Computer Science and Engineering
- **The Voleon Group** (Jan 2017–Feb 2018)  
Member of Research Staff
- **Google Inc.** (June 2015–Jan 2017)  
Software Engineer
- **University of California, Berkeley** (Sept. 2014–June 2015)  
Postdoctoral Scholar at AMPLab  
Sponsor: Benjamin Recht
- **D. E. Shaw & Co.** (June 2013–Sept. 2013)  
Quantitative analyst intern
- **NEC Labs – Princeton** (June 2012–Sept. 2012)  
Research Intern

## EDUCATION

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- **California Institute of Technology**  
MS in Electrical Engineering (Sept. 2009–June 2011)  
PhD in Electrical Engineering (June 2011–June 2015)  
Advisor: Babak Hassibi
- **Bilkent University** (Sept. 2005–June 2009)  
BS in Electrical Engineering

## RESEARCH INTERESTS

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**My research** lies at the confluence of machine learning, optimization, and statistics. I am broadly interested in *finding principled solutions to contemporary machine learning and data science problems by using tools from mathematical optimization and statistics.*

**Central goal:** The gap between our fundamental understanding of artificial intelligence methodologies and AI products deployed in practice is widening. My research aims to bridge this gap via foundational advances that enable *learning and decision making with optimal statistical and computational efficiency.*

**Current research directions:** foundations of transformers and large language models, learning and optimization theory, high-dimensional problems, reinforcement learning, compute-efficient architectures

## HONORS AND AWARDS

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- **Google Research Scholar** award, 2022.
- **NSF CAREER Award**, 2021.
- **UCR Regents Faculty Development Award**, 2021.
- **Best Student Paper** at IEEE Int. Conf. on Semantic Computing, 2021.
- **UCR Regents Faculty Fellowship**, 2020.

- **Wilts Prize for Best Thesis in Electrical Engineering** Caltech, June 2015.
- **Simons–Berkeley Research Fellowship** on Information Theory, Spring 2015.
- **Ranked 1<sup>st</sup>** in Electrical Engineering Qualifying Exam, Caltech, 2010.
- Recipient of **Caltech’s Division Fellowship**, 2009-2010.
- Bilkent University **Undergraduate Fellowship**, 2005-2009.
- **Presidential Fellowship** awarded to **Top 100** students, 2005-2009, Turkey.
- **Top 50** in nationwide University Entrance Exam, 2005, Turkey.
- **Silver Medalist** in International Mathematical Olympiad (**IMO**), Mexico, 2005.
- **Silver Medalist** in Balkan Mathematical Olympiad (**BMO**), Romania, 2005.

## PROFESSIONAL ACTIVITIES & SERVICE

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- **Teaching experience:**
  - (a) **Instructor:**
    - “EE/CS 248 - Optimization for Machine Learning”, University of California, Riverside, Fall 2021. The course is introduced by me.
    - “EE/CS 228 - Introduction to Deep Learning”, University of California, Riverside, Spring 2021. The course is introduced by me.
    - “EE 260 - Seminar on Deep Learning”, University of California, Riverside, 2020.
    - “EE 215 - Stochastic Processes”, University of California, Riverside, 2018 & 2019.
    - “EE 114 - Probability, Random Variables, and Random Processes”, UC Riverside, 2018-2021.
    - Turkish Math Olympiad Team, 2008.
  - (b) **Teaching assistant:**
    - “Communication–System Fundamentals,” Caltech, 2010-2013.
    - “Stochastic and Adaptive Signal Processing,” Caltech, 2014.
- **Associate Editor:** Transactions on Signal Processing.
- **Area Chair:** Conference on Neural Information Processing Systems (NeurIPS) 2023, Artificial Intelligence and Statistics (AISTATS) 2021, 2022, AAAI Conference on Artificial Intelligence (2023).
- **NSF Panelist:** Once for Division of Computer and Network Systems (CISE/CNS), Once for Division of Computing and Communication Foundations (CISE/CCF)
- **Panelist for the Army Research Office**
- **Program Committee:** ACM Knowledge Discovery and Data Mining (SIGKDD) 2021, 2022, Conference on Learning Theory (COLT) 2021.
- **Review service**
  - (a) **Conferences:** Frequent reviewer for Neural Information Processing Systems (NeurIPS), Int. Conf. on Machine Learning (ICML), Int. Conf. on Learning Representations (ICLR), Conf. on Learning Theory (COLT), IEEE International Symposium on Information Theory (ISIT), Sampling Theory and Applications (SampTA), IEEE Computer Vision and Pattern Recognition (CVPR), IEEE International Conference on Acoustics, Speech, & Signal Processing (ICASSP).
  - (b) **Journals:** Nature, Nature Machine Intelligence, IEEE Access, SIAM Mathematics of Data Science (SIMODS), IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), IEEE Trans. on Info. Theory (TIT), Annals of Statistics, Journal of Machine Learning Research (JMLR), IEEE Trans. on Signal Proc. (TSP), IEEE Signal Proc. Letters (SPL), Bernoulli, Information and Inference, Mathematical Programming, Applied and Comp. Harmonic Analysis (ACHA), SIAM Journal on Matrix Analysis and Applications (SIMAX), SIAM Journal on Imaging Sciences (SIIMS).
- **UCR Data Science Program.** Member of the committee designing the upcoming Master’s program in Computational Data Science. Also introduced a new data science specific course for the program titled *Fundamentals of Data Science*.
- **Student and Postdoc advising**

- PhD students
  - \* Mingchen Li (2018-present)
  - \* Yahya Sattar (2018-present)
  - \* Yingcong Li (2020-present)
  - \* Xuechen Zhang (2020-present, co-advised with Jiasi Chen)
  - \* Xiangyu Chang (2020-present, co-advised with Amit Roy-Chowdhury)
  - \* Emrullah Ildiz (2022-present)
- Postdocs mentored:
  - \* Zhe Du
  - \* Karthik Elamvazhuthi
  - \* Yuzhen Qin
  - \* Davoud Ataee Tarzanagh
- Supervised ten undergraduate student researchers.
- Supervised seven master’s students: One led to MS thesis, two led to MS projects, three joined my research group as PhD students.

## AWARDED FUNDING

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**Total share:** \$2M

1. **Samet Oymak**, Necmiye Ozay “*Foundations of Sequence Models for Learning, Estimation, and Control of Dynamical Systems*”, MIDAS Propelling Original Data Science (PI, share: \$35,000).
2. Nael Abu-Ghazaleh, **Samet Oymak**, Khaled Khasawneh “*Collaborative Research: SHF: Medium: Approximate Computing for Machine Learning Security: Foundations and Accelerator Design*”, NSF Software & Hardware Foundation (Co-PI, share: \$400,000).
3. **Samet Oymak** “*Personalized Training Strategies for Heterogeneous Data*”, Google Research Scholar (single PI: \$60,000).
4. **Samet Oymak** “*CAREER: Foundations of Resource Efficient Machine Learning*”, NSF Comm & Information Foundations (single PI: \$559,000).
5. ShiNung Ching, Bruno Sinopoli, Ilya Monosov, Thomas Papouin, Fabio Pasqualetti, **Samet Oymak**, MURI Award from Army Research Office, “*Understanding and Implementing Multi-Scale Neuro-Glial Dynamics for Robust Non-Markovian Learning and Decision-Making*” (share: \$556,000).
6. Necmiye Ozay, Dimitra Panagou, **Samet Oymak**, Sze Zheng Yong “*CPS: Medium: Collaborative Research: Data-Driven Modeling and Preview-Based Control for Cyber-Physical System Safety*”, NSF Cyber Physical Systems (share: \$290,000).
7. **Samet Oymak** “*Semi-supervised Federated Learning*,” UCR Regents’ Faculty Fellowship (\$6,000).
8. **Samet Oymak** “*Efficient Subnets: Algorithmic Foundations and Applications to Multitask Learning*,” UCR Regents Faculty Development Award (\$5,000).
9. **Samet Oymak**, Jiasi Chen, KK Ramakrishnan “*Augmented Reality for the Infrared Spectrum*,” UCR Collaborative Seed Grant (\$10,000).

## PUBLICATIONS (My students underlined)

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**Google Scholar profile:** <https://scholar.google.com/citations?user=AY6InkoAAAAJ>

- **Citations:** 3800+
- **h-index:** 32

### Preprints

- P1.** Davoud Ataee Tarzanagh, Yingcong Li, Xuechen Zhang, **Samet Oymak**, “Margin Maximization in Attention Mechanism”, in submission, 2023.
- P2.** Yingcong Li, Kartik Sreenivasan, Angeliki Giannou, Dimitris Papailiopoulos, and **Samet Oymak**, “Dissecting Chain-of-Thought: A Study on Compositional In-context Learning of MLPs”, in submission, 2023.

- P3. Davoud Ataee Tarzanagh, Mingchen Li, Pranay Sharma, and **Samet Oymak**, “Federated Multi-Sequence Stochastic Approximation with Local Hypergradient Estimation”, in submission, 2023.
- P4. Xuechen Zhang, Mingchen Li, Xiangyu Chang, Jiasi Chen, Amit Roy-Chowdhury, Ananda Theertha Suresh, and **Samet Oymak**, “FedYolo: Augmenting Federated Learning with Pretrained Transformers”, in submission, 2023.
- P5. Xiangyu Chang, Basak Guler, Srikanth Krishnamurthy, Ananthram Swami, **Samet Oymak**, Amit Roy-Chowdhury, “*FLUSH: Federated Learning under Diverse Heterogeneities*,” in submission, 2023.
- P6. Sk Miraj Ahmed, Raychaudhuri, **Samet Oymak**, Amit Roy-Chowdhury, “*MeTA: Multi-source Test Time Adaptation*,” in submission, 2023.
- P7. Yingcong Li, Mingchen Li, Salman Asif, **Samet Oymak**, “*Provable and Efficient Continual Representation Learning*,” in submission, 2022.
- P8. Yahya Sattar, Zhe Du, Davoud Ataee Tarzanagh, Necmiye Ozay, Laura Balzano, **Samet Oymak**, “*Identification and Adaptive Control of Markov Jump Systems: Sample Complexity and Regret Bounds*,” in submission, 2022.
- P9. Xuechen Zhang, **Samet Oymak**, Jiasi Chen, “*Post-hoc Models for Inference Performance Estimation*,” in submission, 2021.
- P10. Mingchen Li, Yahya Sattar, Christos Thrampoulidis, **Samet Oymak**, “*Exploring Optimization and Generalization in Model Pruning*”, in submission, 2021.

#### Journal papers

- J1. Yue Sun, **Samet Oymak**, Maryam Fazel, “*Finite Sample Identification of Low-order LTI Systems via Nuclear Norm Regularization*,” IEEE Open Journal of Control Systems, 2022.
- J2. Yahya Sattar and **Samet Oymak**, “*Non-asymptotic and Accurate Learning of Nonlinear Dynamical Systems*”, Journal of Machine Learning Research (JMLR), 2022.
- J3. Yuzhen Qin, Tommaso Menara, **Samet Oymak**, ShiNung Ching, Fabio Pasqualetti, “*Non-Stationary Representation Learning for Sequential Linear Bandits*,” IEEE Open Journal of Control Systems, 2021.
- J4. **Samet Oymak**, “*Provable Super-Convergence with a Large Cyclical Learning Rate*,” IEEE Signal Processing Letters 2021.
- J5. **Samet Oymak** and Necmiye Ozay, “*Revisiting Ho-Kalman based system identification: robustness and finite-sample analysis*”, IEEE Trans. on. Automatic Control, 2021.
- J6. Nhat Le, A.B. Siddique, Fuad Jamour, **Samet Oymak**, Vagelis Hristidis “*Generating Predictable and Adaptive Dialog Policies in Single- and Multi-domain Goal-oriented Dialog Systems*”, IEEE Int. Journal of Semantic Computing (IJSC) 2021.
- J7. **Samet Oymak** and Mahdi Soltanolkotabi, “*Learning a deep convolutional neural network via tensor decomposition*,” Information & Inference 2021.
- J8. Yahya Sattar and **Samet Oymak**, “*Quickly finding the best linear model in high-dimensions*”, IEEE Transactions on Signal Processing 2020.
- J9. **Samet Oymak** and Mahdi Soltanolkotabi, “*Towards moderate overparameterization: Global convergence guarantees for training neural networks*,” IEEE Journal on Selected Areas in Information Theory 2020.
- J10. **Samet Oymak**, Mahdi Soltanolkotabi, and Benjamin Recht “*Sharp Time–Data Tradeoffs for Linear Inverse Problems*,” IEEE Transactions on Information Theory, June 2018.
- J11. **Samet Oymak** and Joel Tropp “*Universality Laws for Randomized Dimension Reduction, with Applications*,” Information & Inference, Nov 2017.
- J12. **Samet Oymak** and Mahdi Soltanolkotabi “*Fast and Reliable Parameter Estimation from Nonlinear Observations*,” SIAM Journal on Optimization, Oct 2017.
- J13. **Samet Oymak**, Mahdi Soltanolkotabi, and Benjamin Recht “*Isometric sketching of any set via the Restricted Isometry Property*,” Information & Inference, March 2018.

- J14.** **Samet Oymak**, Amin Jalali, Maryam Fazal, Yonina Eldar, and Babak Hassibi, “*Simultaneously Structured Models with Application to Sparse and Low-rank Matrices*,” IEEE Transactions on Information Theory, 61(5), 2886-2908, 2015.
- J15.** **Samet Oymak** and Babak Hassibi, “*Sharp MSE Bounds for Proximal Denoising*,” Foundations of Computational Mathematics, October 2015.
- J16.** Kishore Jaganathan, **Samet Oymak**, and Babak Hassibi, “*Sparse Phase Retrieval: Uniqueness Guarantees and Recovery Algorithms*,” IEEE Transactions on Signal Processing, May 2017.

**Conference papers**

- C1.** **Samet Oymak**, Ankit Singh Rawat, Mahdi Soltanolkotabi, and Christos Thrampoulidis, “On the Role of Attention in Prompt-tuning”, Int. Conf. on Machine Learning (ICML), 2023.
- C2.** Yingcong Li, Emrullah Ildiz, Dimitris Papailiopoulos, and **Samet Oymak**, “Transformers as Algorithms: Generalization and Stability in In-context Learning”, International Conference on Machine Learning (ICML), 2023.
- C3.** Karthik Elamvazhuthi, Xuechen Zhang, **Samet Oymak**, and Fabio Pasqualetti, “Learning on Manifolds: Universal Approximations Properties using Geometric Controllability Conditions for Neural ODEs”, L4DC (oral presentation) 2023.
- C4.** Yingcong Li and **Samet Oymak**, “Provable Pathways: Learning Multiple Tasks over Multiple Paths”, AAAI Conference on Artificial Intelligence, 2023.
- C5.** Yuzhen Qin, Yingcong Li, Fabio Pasqualetti, Maryam Fazal, **Samet Oymak**, “Stochastic Contextual Bandits with Long Horizon Rewards” AAAI Conference on Artificial Intelligence 2023.
- C6.** Yingcong Li and **Samet Oymak**, “On the Fairness of Multitask Representation Learning”, ICASSP 2023.
- C7.** Yahya Sattar, **Samet Oymak**, Necmiye Ozay, “Finite Sample Identification of Bilinear Dynamical Systems”, IEEE Conference on Decision and Control (CDC) 2022.
- C8.** Davoud Ataee Tarzanagh, Mingchen Li, Christos Thrampoulidis, **Samet Oymak**, “*FedNest: Federated Bilevel, Minimax, and Compositional Optimization*,” **ICML 2022, oral acceptance**
- C9.** Zhe Du, Yahya Sattar, Davoud Ataee Tarzanagh, Laura Balzano, Necmiye Ozay, **Samet Oymak**, “*Data-Driven Control of Markov Jump Systems: Sample Complexity and Regret Bounds*,” American Control Conference (ACC) 2022.
- C10.** Yahya Sattar, Zhe Du, Davoud Ataee Tarzanagh, **Samet Oymak**, Laura Balzano, Necmiye Ozay, “*Certainty Equivalent Quadratic Control for Markov Jump Systems*,” ACC 2022.
- C11.** Yuzhen Qin, Tommaso Menara, **Samet Oymak**, ShiNung Ching, Fabio Pasqualetti, “*Representation Learning for Context-Dependent Decision-Making*,” ACC 2022.
- C12.** Mingchen Li, Xuechen Zhang, Christos Thrampoulidis, Jiasi Chen, **Samet Oymak**, “*AutoBalance: Optimized Loss Functions for Imbalanced Data*,” Thirty-fifth Conference on Neural Information Processing Systems (**NeurIPS 2021**).
- C13.** Yue Sun, Adhyyan Narang, Halil Ibrahim Gulluk, **Samet Oymak**, Maryam Fazal, “*Towards Sample-Efficient Overparameterized Meta-Learning*”, **NeurIPS 2021**.
- C14.** Ganesh R. Kini, Orestis Paraskevas, **Samet Oymak**, Christos Thrampoulidis, “*Label-Imbalanced and Group-Sensitive Classification under Overparameterization*,” **NeurIPS 2021**.
- C15.** **Samet Oymak**, Mingchen Li, Mahdi Soltanolkotabi, “*Generalization Guarantees for Neural Architecture Search with Train-Validation Split*,” Int. Conf. on Machine Learning (**ICML**) 2021.
- C16.** Mohammad Reza Zare Shahneh, **Samet Oymak**, Amr Magdy, “*A-GWR: Fast and Accurate Geospatial Inference via Augmented Geographically Weighted Regression*,” full paper at **ACM SIGSPATIAL**, 2021.
- C17.** Sk Miraj Ahmed, Dripta S. Raychaudhuri, Sujoy Paul, **Samet Oymak**, Amit K. Roy-Chowdhury, “*Unsupervised Multi-source Domain Adaptation Without Access to Source Data*,” Conf. on Computer Vision and Pattern Recognition (**CVPR**) 2021, **oral presentation**.
- C18.** **Samet Oymak** and Talha Cihad Gulcu, “*A Theoretical Characterization of Semi-supervised Learning with Self-training for Gaussian Mixture Models*, The 24th International Conference on Artificial Intelligence and Statistics (**AISTATS**) 2021.

- C19.** Xiangyu Chang, Yingcong Li, **Samet Oymak**, Christos Thrampoulidis “*Provable Benefits of Overparameterization in Model Compression: From Double Descent to Pruning Neural Networks*”, The Thirty-Fifth **AAAI** Conference on Artificial Intelligence 2021.
- C20.** Yao-Chun Chan, Mingchen Li and **Samet Oymak**, “*On the Marginal Benefit of Active Learning: Does Self-Supervision Eat Its Cake?*”, International Conference on Acoustics, Speech, & Signal Processing (IEEE **ICASSP**) 2021.
- C21.** Halil Ibrahim Gulluk, Yue Sun, **Samet Oymak**, Maryam Fazel, “*Sample Efficient Subspace-based Representations for Nonlinear Meta-Learning*”, International Conference on Acoustics, Speech, & Signal Processing (IEEE **ICASSP**) 2021.
- C22.** Nhat Le, A.B. Siddique, Fuad Jamour, **Samet Oymak**, Vagelis Hristidis “*Predictable and Adaptive Goal-oriented Dialog Policy Generation*”, IEEE International Conference of Semantic Computing (ICSC) 2021 (**Best Student Paper award**).
- C23.** Christos Thrampoulidis, **Samet Oymak**, Mahdi Soltanolkotabi, “*Theoretical Insights Into Multiclass Classification: A High-dimensional Asymptotic View*,” Conference on Neural Information Processing Systems (**NeurIPS**) 2020.
- C24.** Abu Bakar Siddique, **Samet Oymak**, Vagelis Hristidis “Unsupervised Paraphrasing via Deep Reinforcement Learning”, ACM Special Interest Group on Knowledge Discovery and Data Mining (**SIGKDD**) 2020.
- C25.** Yue Sun, **Samet Oymak**, and Maryam Fazel “Finite Sample System Identification: Optimal Rates and the Role of Regularization”, Learning for Dynamics and Control (**L4DC**) 2020.
- C26.** Mingchen Li, Mahdi Soltanolkotabi, **Samet Oymak**, “*Gradient Descent is Provably Robust to Label Noise for Overparameterized Neural Networks*,” Artificial Intelligence and Stats (**AISTATS**) 2020.
- C27.** Ahmet Demirkaya, Jiasi Chen and **Samet Oymak**, “*Exploring the Role of Loss Functions in Multiclass Classification*”, Conference on Information Sciences and Systems (CISS) 2020.
- C28.** Yahya Sattar and **Samet Oymak**, “*A Simple Framework for Learning Stabilizable Systems*”, IEEE Int. Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP) 2019.
- C29.** Hisham Alhulayyil, Kittipat Apicharttrisorn, Jiasi Chen, Karthik Sundaresan, **Samet Oymak** and Srikanth Krishnamurthy “WOLT: Auto-Configuration of Integrated Enterprise PLC-WiFi Networks”, International Conference on Distributed Computing Systems (**ICDCS**) 2020.
- C30.** Zachary Zimmerman, Nader Shakibay Senobari, Gareth Funning, Evangelos Papalexakis, **Samet Oymak**, Philip Brisk, and Eamonn Keogh, “*Matrix Profile XVIII: Time Series Mining in the Face of Fast Moving Streams using a Learned Approximate Matrix Profile*,” IEEE International Conference on Data Mining (**ICDM**), long paper, 2019.
- C31.** **Samet Oymak**, Zalan Fabian, Mingchen Li, Mahdi Soltanolkotabi, “*Generalization, Adaptation and Low-Rank Representation in Neural Networks*” *ASILOMAR Conference on Signals, Systems, and Computers, 2019*.
- C32.** **Samet Oymak**, Jiasi Chen, and Mehrdad Mahdavi, “Learning Feature Nonlinearities with Non-Convex Regularized Binned Regression,” *IEEE Int. Symp. on Info. Theory (ISIT) 2019*.
- C33.** **Samet Oymak** and Salman Asif, “Exactly decoding a vector through ReLU activation”, *International Conference on Acoustics, Speech, & Signal Processing (IEEE ICASSP), 2019*.
- C34.** **Samet Oymak**, “Overparameterized Nonlinear Optimization with Applications to Neural Nets,” *Sampling Theory and Applications (SampTA) 2019, invited paper*.
- C35.** **Samet Oymak** and Necmiye Ozay, “Non-asymptotic Identification of LTI Systems from a Single Trajectory,” *American Control Conference (ACC) 2019*.
- C36.** **Samet Oymak** and Mahdi Soltanolkotabi, “Overparameterized Nonlinear Learning: Gradient Descent Takes the Shortest Path?,” *International Conf. on Machine Learning (ICML) 2019*.
- C37.** **Samet Oymak**, “Stochastic Gradient Descent Learns State Equations with Nonlinear Activations,” *Conference on Learning Theory (COLT) 2019*.
- C38.** **Samet Oymak**, “Learning Compact Neural Networks with Regularization,” *International Conference on Machine Learning (ICML), 2018*.

- C39.** *Samet Oymak, Christos Thrampoulidis and Babak Hassibi, “Near-Optimal Sample Complexity Bounds for Circulant Binary Embedding,” International Conference on Acoustics, Speech, & Signal Processing (IEEE ICASSP), 2017 Special Session.*
- C40.** *Christos Thrampoulidis, Samet Oymak, and Babak Hassibi, “Regularized linear regression: A precise analysis of the estimation error,” Proc. of the Conf. on Learning Theory (COLT), 2015.*
- C41.** *Samet Oymak and Babak Hassibi, “The proportional mean decomposition: A bridge between the Gaussian and Bernoulli ensembles,” International Conference on Acoustics, Speech, & Signal Processing (IEEE ICASSP), 2015.*
- C42.** *Xinghao Pan, Dimitris Papailiopoulos, Samet Oymak, Benjamin Recht, Kannan Ramchandran, Michael I. Jordan, “Parallel Correlation Clustering on Big Graphs”, Neural Information Processing Systems (NeurIPS) 2015.*
- C43.** *Ramya Vinayak Korlakai, Samet Oymak, and Babak Hassibi, “Graph Clustering With Missing Data: Convex Algorithms and Analysis,” Neural Information Processing Systems (NeurIPS) 2014.*
- C44.** *Samet Oymak and Babak Hassibi, “A Case for Orthogonal Measurements in Linear Inverse Problems,” Int. Symp. on Info. Theory (IEEE ISIT) 2014.*
- C45.** *Christos Thrampoulidis, Samet Oymak, and Babak Hassibi, “Simple Error Bounds for Regularized Noisy Linear Inverse Problems,” Int. Symp. on Info. Theory (IEEE ISIT) 2014.*
- C46.** *Ramya Vinayak Korlakai\*, Samet Oymak\*, and Babak Hassibi, “Sharp Performance Bounds for Graph Clustering via Convex Optimization,” International Conference on Acoustics, Speech, & Signal Processing (IEEE ICASSP), 2014, (\* equal contribution).*
- C47.** *Samet Oymak, Amin Jalali, Maryam Fazel, and Babak Hassibi, “Noisy Estimation of Simultaneously Structured Models: Limitations of Convex Relaxation,” 52nd IEEE Conference on Decision and Control (CDC 2013).*
- C48.** *Samet Oymak, Christos Thrampoulidis, and Babak Hassibi, “The Squared-Error of Generalized LASSO: A Precise Analysis,” 51st Annual Allerton Conference on Communication, Control and Computing, 2013, extended paper at arXiv:1311.0830.*
- C49.** *Kishore Jaganathan, Samet Oymak, and Babak Hassibi, “Sparse Phase Retrieval: Convex Algorithms and Limitations,” Int. Symp. on Info. Theory (IEEE ISIT) 2013.*
- C50.** *Samet Oymak and Babak Hassibi, “On a Relation between the Minimax Risk and the Phase Transitions of Compressed Recovery,” 50th Annual Allerton Conference on Communication, Control and Computing, 2012.*
- C51.** *Kishore Jaganathan, Samet Oymak, and Babak Hassibi, “On Robust Phase Retrieval for Sparse Signals,” 50th Annual Allerton Conference on Communication, Control and Computing, 2012.*
- C52.** *Samet Oymak, Amin Khajehnejad and Babak Hassibi, “Recovery Threshold for Optimal Weight  $\ell_1$  Minimization,” International Symposium on Information Theory (IEEE ISIT) 2012.*
- C53.** *Kishore Jaganathan, Samet Oymak, and Babak Hassibi, “Recovery of Sparse 1-D Signals from the Magnitudes of their Fourier Transform,” Int. Symposium on Info. Theory (IEEE ISIT) 2012.*
- C54.** *Kishore Jaganathan, Samet Oymak, and Babak Hassibi, “Phase Retrieval for Sparse Signals Using Rank Minimization,” Int. Conf. on Acoustics, Speech, and Signal Proc. (ICASSP), 2012.*
- C55.** *Cheuk Ting Li, Samet Oymak, and Babak Hassibi, “Deterministic Phase Guarantees for Robust Recovery in Incoherent Dictionaries,” International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2012.*
- C56.** *Anilesh K. Krishnaswamy, Samet Oymak, and Babak Hassibi, “A Simpler Approach to Weighted  $\ell_1$  Minimization,” Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP), 2012.*
- C57.** *Samet Oymak, Karthik Mohan, Maryam Fazel, and Babak Hassibi, “A Simplified Approach to Recovery Conditions for Low Rank Matrices,” Int. Symp. on Info. Theory (IEEE ISIT) 2011.*
- C58.** *Samet Oymak, Amin Khajehnejad, and Babak Hassibi, “Subspace Expanders and Matrix Rank Minimization,” International Symposium on Information Theory (IEEE ISIT) 2011.*
- C59.** *Samet Oymak and Babak Hassibi, “Tight Recovery Thresholds and Robustness Analysis for Nuclear Norm Minimization,” International Symposium on Information Theory (IEEE ISIT) 2011.*

- C60.** Amin Khajehnejad, **Samet Oymak**, and Babak Hassibi, “Subspace Expanders and Fast Recovery of Low rank Matrices,” *International Conference on Sampling Theory and Applications*, 2011.
- C61.** **Samet Oymak**, Amin Khajehnejad, and Babak Hassibi, “Improved Thresholds for Rank Minimization,” *International Conf. on Acoustics, Speech, and Signal Processing (ICASSP)* 2011.
- C62.** Mainak Chowdhury, **Samet Oymak**, Amin Khajehnejad, and Babak Hassibi, “Robustness Analysis of A List Decoding Algorithm For Compressed Sensing,” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* 2011.
- C63.** **Samet Oymak**, Amin Khajehnejad, and Babak Hassibi, “Weighted Compressed Sensing and Rank Minimization,” *International Conf. on Acoustics, Speech, and Signal Processing (ICASSP)* 2011.
- C64.** Xin Liu, **Samet Oymak**, Athina Petropulu, and Kapil R. Dandekar “Collision Resolution Based on Pulse Shape Diversity,” *Signal Processing Advances in Wireless Communications (SPAWC)*, 2009.

### Peer-reviewed workshops

1. **Samet Oymak**, Ankit Singh Rawat, Mahdi Soltanolkotabi, and Christos Thrampoulidis, “On the Role of Attention in Prompt-tuning”, ICLR Workshop on Mathematical and Empirical Understanding of Foundation Models, 2023.
2. Maryam Shahcheraghi, Trevor Cappon, **Samet Oymak**, Evangelos Papalexakis, Eamonn Keogh, Zachary Zimmerman, Philip Brisk, “*Matrix Profile Index Approximation for Streaming Time Series*”, IEEE BigData Workshop on Real-time Stream Analytics, 2021.
3. Yahya Sattar, Zhe Du, Davoud Ataee Tarzanagh, Necmiye Ozay, Laura Balzano, **Samet Oymak**, “*Identification and Adaptive Control of Markov Jump Systems: Sample Complexity and Regret Bounds*,” ICML Workshop on Reinforcement Learning Theory, 2021.
4. Yuzhen Qin, Tommaso Menara, **Samet Oymak**, ShiNung Ching, Fabio Pasqualetti, “*Non-Stationary Representation Learning in Sequential Multi-Armed Bandits*,” ICML Workshop on Reinforcement Learning Theory, 2021.
5. Ganesh R. Kini, Orestis Paraskevas, **Samet Oymak**, Christos Thrampoulidis, “*Label-Imbalanced and Group-Sensitive Classification under Overparameterization*,” ICML Workshop on Overparameterization: Pitfalls & Opportunities, 2021.
6. Xiangyu Chang, Yingcong Li, **Samet Oymak**, Christos Thrampoulidis “*Provable Benefits of Overparameterization in Model Compression: From Double Descent to Pruning Neural Networks*”, Workshop on the Theory of Overparameterized Machine Learning, **Contributed Talk (longer presentation)**, 2021.
7. Yue Sun, Halil Ibrahim Gulluk, Adhyyan Narang, **Samet Oymak**, Maryam Fazel, “*Towards Sample-Efficient Overparameterized Meta-Learning*”, Workshop on the Theory of Overparameterized Machine Learning, 2021.
8. Ganesh R. Kini, Orestis Paraskevas, **Samet Oymak**, Christos Thrampoulidis, “*Label-Imbalanced and Group-Sensitive Classification under Overparameterization*,” Workshop on the Theory of Overparameterized Machine Learning, 2021.
9. Yuan Zhao, Jiasi Chen and **Samet Oymak**, “*On the Role of Dataset Quality and Heterogeneity in Model Confidence*”, arXiv:2002.09831, ICML 2020 Workshop on Uncertainty and Robustness in Deep Learning, 2020.
10. Maryam Shahcheraghi, Trevor Cappon, **Samet Oymak**, Evangelos Papalexakis, Eamonn Keogh, Zachary Zimmerman, Philip Brisk, “*Matrix Profile Index Prediction for Streaming Time Series*”, NeurIPS Workshop on Machine Learning for Systems, 2020.
11. **Samet Oymak**, Zalan Fabian, Mingchen Li, Mahdi Soltanolkotabi, “*Generalization Guarantees for Neural Networks via Harnessing the Low-rank Structure of the Jacobian*,” ICML Workshop on Generalization in Deep Networks, **Oral presentation**, 2019.
12. Amir Taheri, **Samet Oymak**, Kevin Coombes, and Arindam Banerjee, “High Dimensional Data Enrichment: Interpretable, Fast, and Data-Efficient”, ICML Workshop on Adaptive and Multitask Learning 2019.

### Technical reports



1. **Samet Oymak** and Talha Cihad Gulcu, “*Statistical and Algorithmic Insights for Semi-supervised Learning with Self-training*,” arXiv:2006.11006, short version appeared at AISTATS 2021.
2. **Samet Oymak**, Zalan Fabian, Mingchen Li, Mahdi Soltanolkotabi, “*Generalization Guarantees for Neural Networks via Harnessing the Low-rank Structure of the Jacobian*,” short version appeared at ICML Workshop on Generalization in Deep Networks 2019.
3. Amir Taheri, **Samet Oymak**, Kevin Coombes, and Arindam Banerjee, “High Dimensional Data Enrichment: Interpretable, Fast, and Data-Efficient”, short version appeared at ICML Workshop on Adaptive and Multitask Learning 2019.
4. **Samet Oymak** “*Near-Optimal Sample Complexity Bounds for Circulant Binary Embedding*,” arXiv:1603.03178, short version published at IEEE ICASSP 2017.
5. **Samet Oymak** and Benjamin Recht “*Near-Optimal Bounds for Binary Embeddings of Arbitrary Sets*,” arXiv:1512.04433, 2017.
6. **Samet Oymak**, Chris Thrampoulidis, and Babak Hassibi, “*Simple Bounds for Noisy Linear Inverse Problems with Exact Side Info.*,” arXiv:1312.0641, related work published at IEEE ISIT 2014.
7. **Samet Oymak** and Babak Hassibi, “*Finding Dense Clusters via Low Rank + Sparse Decomposition*,” arXiv:1104.5186, related work published at IEEE ICASSP 2014.
8. **Samet Oymak** and Babak Hassibi, “*New Null Space Results and Recovery Thresholds for Matrix Rank Minimization*,” arXiv:1011.6326, short version published at IEEE ISIT 2011.

### Book chapters

1. Christos Thrampoulidis, **Samet Oymak**, and Babak Hassibi. ”Recovering Structured Signals in Noise: Least-Squares Meets Compressed Sensing.” as a part of “Compressed Sensing and its Applications” Springer 2014.

### Patents

1. Guosen Yue, Narayan Prasad, Sampath Rangarajan, **Samet Oymak**. ”Low-complexity precoder design for large-scale mimo communication systems.” US Patent US9450657B2, Sept. 2016.

### INVITED TALKS

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1. “Benefits of Attention Mechanism for Context-aware Learning”, SIAM Conference on Optimization, 2023.
2. “Learning Multiple Tasks over Multiple Paths”, UCR Statistics Seminar, Nov 2022.
3. “Learning Multiple Tasks over Multiple Paths”, Google Research New York, Nov 2022.
4. “Learning Multiple Tasks over Multiple Paths”, KTH Decision and Control Systems Seminar, Nov 2022.
5. “Understanding Overparameterization through Feature Covariance and High-dimensional Analysis”, University of California, Riverside, Data Science Seminar, May 2022.
6. “Understanding Overparameterization through Feature Covariance and High-dimensional Analysis”, University of Michigan, ECE Seminar, April 2022.
7. “Towards Fair and Generalizable Machine Learning with Large Models”, Harvard University, EE Seminar, March 2022.
8. “Towards Fair and Efficient Machine Learning with Large Models”, University of Washington, ECE Seminar, February 2022.
9. “Towards Fair and Efficient Machine Learning with Large Models”, University of Pennsylvania, ESE Seminar, February 2022.
10. “Towards Fair and Efficient Machine Learning with Large Models”, University of California, Santa Barbara, ECE Seminar, February 2022.
11. “Towards Fair and Efficient Machine Learning with Large Models”, Pennsylvania State University, CSE Seminar, February 2022.
12. “Principles of Efficient & Fair Learning with Overparameterization”, University of Southern California, ML Symposium, December 2021.

13. Upcoming ICASSP 2022 Tutorial with Christos Thrampoulidis and Yue Lu: “Exploring and Exploiting High-Dimensional Phenomena in Estimation and Learning: A Friendly Tour for Signal-Processing Researchers”
14. “Architecture and Loss Function Design for Optimized Accuracy and Fairness”, Statistics Seminar, Stanford University, August 2021.
15. “Architecture and Loss Function Design for Optimized Accuracy and Fairness”, Alibaba Research, August 2021.
16. “Provable Benefits of Overparameterization in Model Compression”, University of Iowa, May 2021.
17. “Provable Benefits of Overparameterization in Model Compression”, Ecole polytechnique federale de Lausanne (EPFL), March 2021.
18. “Provable Benefits of Overparameterization in Model Compression”, Uppsala University, Feb. 2021.
19. “Overparameterized Nonlinear Optimization with Applications to Neural Nets”, Sampling Theory and Applications (SampTa) 2019.
20. “Overparameterization without Overfitting: From Compressed Sensing to Deep Learning”, UC San Diego HDSI Seminar, April 2019.
21. “Overparameterization without Overfitting: From Compressed Sensing to Deep Learning”, UC Riverside, Economics Seminar, April 2019.
22. “Overparameterization without Overfitting: From Compressed Sensing to Deep Learning”, California Institute of Technology, March 2019.
23. “Overparameterization without Overfitting: From Compressed Sensing to Deep Learning”, UC Riverside Data Science Seminar, March 2019.
24. “Learning from Big but Finite Data: Algorithms and Insights for Neural Networks,” University of Michigan, Sept 2018.
25. “Learning from Big but Finite Data: From Neural Networks to Linear Dynamical Systems,” Bilkent University, June 2018.
26. “Learning from Big but Finite Data: From Neural Networks to Linear Dynamical Systems,” Data Science Seminar, UC Riverside, May 2018.
27. “Sharp tradeoffs for high-dimensional estimation: Overcoming nonconvex and nonlinear constraints,” University of Colorado Boulder, 2017.
28. “Sharp tradeoffs for high-dimensional estimation: Overcoming nonconvex and nonlinear constraints,” Bilkent University, Turkey, 2017.
29. “Sharp tradeoffs for high-dimensional estimation: Overcoming nonconvex and nonlinear constraints,” University of California, Riverside, 2017.
30. “Universality laws for randomized dimension reduction,” World Congress of Probability and Statistics, July 2016.
31. “Universality of Compressed Sensing Phase Transitions,” Simons Institute, May 2015.
32. “A General Theory of Noisy Linear Inverse Problems,” Renaissance Technologies, February 2014.
33. “A General Theory of Noisy Linear Inverse Problems,” University of Washington, January 2014.
34. “On a Relation between the Minimax Risk and the Phase Transitions of Compressed Recovery,” Allerton 2012 at UIUC, Monticello, IL.
35. “Subspace Expanders and Fast Recovery of Low Rank Matrices,” Sampling Theory and Applications (SampTa) 2011, Singapore.

## **Immigration Status**

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U.S. Permanent Resident  
 Citizenship and birthplace: Turkey