

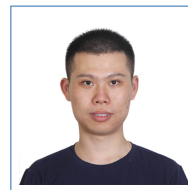
# Jin Sima

## Curriculum Vitae

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### Academic Appointments

- 2022–present **Postdoctoral Researcher**, *University of Illinois Urbana-Champaign*, Urbana, IL  
Coordinated Science Laboratory.  
Host: Prof. Olgica Milenkovic
- 2023–present **Postdoctoral Researcher**, *Purdue University*, West Lafayette, IN  
Center for Science of Information.  
Host: Prof. Wojciech Szpankowski

### Education

- 2016–2022 **Ph.D. in Electrical Engineering**, *California Institute of Technology*, Pasadena, CA  
Advisor: Prof. Jehoshua Bruck.  
Thesis: Correcting Errors in DNA Storage
- 2013–2016 **M.Sc. in Electronic Engineering**, *Tsinghua University*, Beijing, China  
Advisor: Prof. Wei Chen.  
Thesis: On the Capacity Region of Broadcast Channels with Receiver Side Information.
- 2009–2013 **B.Eng. in Electronic Engineering**, *Tsinghua University*, Beijing, China

### Research Interests

My research interests lie in the intersection of Information Theory, Machine Learning, and Theory of Computation, with emphasis on developing models and algorithms for next-generation information (storage, computation, communication, etc.) systems. Most of the information systems I am focusing on are inspired or motivated by biology.

### Honors and Awards

- 2023 IEEE Information Theory Society Thomas M. Cover Dissertation Award
- 2020–2021 IEEE Communication Society Data Storage Best Paper Award
- 2022 Charles Wilts Prize for outstanding doctoral thesis in electrical engineering at Caltech
- 2019 IEEE Jack Keil Wolf ISIT Student Paper Award
- 2015 National Scholarship at Tsinghua University
- 2009 Gold medal in 2009 Chinese Mathematical Olympiad

### Journal Papers

\* indicates equal contributions

- [J1] **J. Sima**, N. Raviv, M. Schwartz, and J. Bruck, "Error Correction for DNA Storage," *accepted by IEEE BITS the Information Theory Magazine*, 2023.
- [J2] **J. Sima**, and J. Bruck, "Correcting Multiple Deletions and Insertions in Multiple-Heads Racetrack

- Memories," *IEEE Transactions on Information Theory*, vol. 69, no. 9, pp. 5619 - 5639, 2023.
- [J3] **J. Sima**, and J. Bruck, "On Optimal k-Deletion Correcting Codes," *IEEE Transactions on Information Theory*, vol. 67, no. 6, pp. 3360 - 3375, 2021. **2020-2021 IEEE Communication Society Data Storage Best Paper Award**
- [J4] **J. Sima**, N. Raviv, and J. Bruck, "On Coding Over Sliced Information," *IEEE Transactions on Information Theory*, vol. 67, no. 5, pp. 2793 - 2807, 2021.
- [J5] **J. Sima**, N. Raviv, and J. Bruck, "Two Deletion Correcting Codes from Indicator Vectors," *IEEE Transactions on Information Theory*, vol. 66, no. 4, pp. 2375-2391, 2020.
- [J6] **J. Sima**, N. Raviv, and J. Bruck, "Robust Indexing - Optimal Codes for DNA Storage," *under review in IEEE Transactions on Information Theory*. (arXiv:2308.07793.)
- [J7] S. Prakash\*, **J. Sima\***, C. Pan\*, E. Chien, and O. Milenkovic, "Federated Classification in Hyperbolic Spaces via Secure Aggregation of Convex Hulls," *accepted by Transactions on Machine Learning Research*. (arXiv:2308.06895.)
- [J8] S. Wang, Y. Tang, **J. Sima**, R. Gabrys, and F. Farnoud, "Non-binary Codes for Correcting a Burst of at Most  $t$  Deletions," *accepted by IEEE Transactions on Information Theory*.
- [J9] C. Wang, **J. Sima**, and N. Raviv, "Break-Resilient Codes for Forensic 3D Fingerprinting," *to be submitted*. (arXiv:2310.03897.)
- [J10] **J. Sima**, R. Gabrys, and J. Bruck, "Syndrome Compression and Codes Correcting Deletions in Binary and Non-binary Cases," *to be submitted*.

## Conference Papers

\* indicates equal contributions

- [C1] **J. Sima\***, C. Wu\*, O. Milenkovic, and W. Szpankowski, "Online Distribution Learning with Local Private Constraints," *under review*.
- [C2] C. Pan\*, **J. Sima\***, S. Prakash\*, V. Rana, and O. Milenkovic, "Machine Unlearning of Federated Clusters," *International Conference on Learning Representations (ICLR)*, 2023.
- [C3] **J. Sima**, Y.-H. Li, I. Shomorony, and O. Milenkovic, "On Constant-Weight Binary  $B_2$ -Sequences," *IEEE International Symposium on Information Theory (ISIT)*, 2023.
- [C4] **J. Sima**, C. Pan, and O. Milenkovic, "Perturbation-Resilient Sets for Dynamic Service Balancing," *IEEE International Symposium on Information Theory (ISIT)*, 2023.
- [C5] K. M. Kilic, **J. Sima**, and J. Bruck, "On the Information Capacity of Associative Computation," *IEEE International Symposium on Information Theory (ISIT)*, 2023.
- [C6] Y.-H. Li, R. Gabrys, **J. Sima**, I. Shomorony, and O. Milenkovic, "Finding a Burst of Positives via Nonadaptive Semiquantitative Group Testing," *IEEE International Symposium on Information Theory (ISIT)*, 2023.
- [C7] K. M. Kilic, **J. Sima**, and J. Bruck, "On Algebraic Constructions of Neural Networks with Small Weights," *IEEE International Symposium on Information Theory (ISIT)*, 2022.

- [C8] **J. Sima**, and J. Bruck, "Trace Reconstruction with Bounded Edit Distance," *IEEE International Symposium on Information Theory (ISIT)*, 2021.
- [C9] S. Wang, **J. Sima**, and F. Farnoud, "Non-binary Codes for Correcting a Burst of at Most 2 Deletions," *IEEE International Symposium on Information Theory (ISIT)*, 2021.
- [C10] **J. Sima**, F. Zhao, and S.-L. Huang, "Exact Recovery in the Balanced Stochastic Block Model with Side Information," *IEEE IEEE Information Theory Workshop (ITW)*, 2021.
- [C11] F. Zhao, **J. Sima**, and S.-L. Huang, "On the Optimal Error Rate of Stochastic Block Model with Symmetric Side Information," *IEEE IEEE Information Theory Workshop (ITW)*, 2021.
- [C12] **J. Sima**, N. Raviv, and J. Bruck, "Robust Indexing - Optimal Codes for DNA Storage," *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- [C13] **J. Sima**, R. Gabrys, and J. Bruck, "Optimal Codes for the  $q$ -ary Deletion Channel," *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- [C14] **J. Sima**, R. Gabrys, and J. Bruck, "Syndrome Compression for Optimal Redundancy Codes," *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- [C15] **J. Sima**, R. Gabrys, and J. Bruck, "Optimal Systematic  $t$ -Deletion Correcting Codes," *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- [C16] **J. Sima** and J. Bruck, "Optimal  $k$ -Deletion Correcting Codes," *IEEE International Symposium on Information Theory (ISIT)*, 2019. **2019 IEEE Jack Keil Wolf ISIT Student Paper Award**
- [C17] **J. Sima** and J. Bruck, "Correcting Deletions in Multiple-Heads Racetrack Memories," *IEEE International Symposium on Information Theory (ISIT)*, 2019.
- [C18] **J. Sima**, N. Raviv, and J. Bruck, "On Coding Over Sliced Information," *IEEE International Symposium on Information Theory (ISIT)*, 2019.
- [C19] **J. Sima**, N. Raviv, and J. Bruck, "Two Deletion Correcting Codes from Indicator Vectors," *IEEE International Symposium on Information Theory (ISIT)*, 2018.
- [C20] A. Jiang, P. Upadhyaya, Y. Wang, K. R. Narayanan, H. Zhou, **J. Sima**, and J. Bruck, "Stopping set elimination for LDPC codes," *Allerton Conference on Communication, Control and Computing (Allerton)*, 2018.
- [C21] **J. Sima** and W. Chen, "Polar codes for broadcast channels with receiver message side information and noncausal state available at the encoder," *IEEE International Symposium on Information Theory (ISIT)*, 2016.
- [C22] **J. Sima** and W. Chen, "Multicasting Messages over Gaussian Broadcast Channels with Receiver Message Side Information," *IEEE International Symposium on Information Theory (ISIT)*, 2015.
- [C23] **J. Sima** and W. Chen, "Joint network and Gelfand-Pinsker coding for 3-receiver Gaussian broadcast channels with receiver message side information," *IEEE International Symposium on Information Theory (ISIT)*, 2014.

- [C24] **J. Sima** and W. Chen, "Joint Network and Dirty-Paper Coding for Multi-way Relay Networks with Pairwise Information Exchange," *IEEE Global Communications Conference (Globecom)*, 2014.

## Teaching Experience

- Spring 2018 **Information and Logic**, *California Institute of Technology*, Teaching Assistant  
Spring 2019  
Fall 2014 **Communication and Networks**, *Tsinghua University*, Teaching Assistant

## Professional Service

**Reviewer for Journals:** Transactions on Information Theory, Journal on Selected Areas in Information Theory (JSAIT), Transactions on Communications, Communication Letters, Finite Fields and their Applications, Transactions on Magnetics.

**Reviewer for Conferences:** International Symposium on Information Theory (ISIT), Information Theory Workshop (ITW), Symposium on Foundations of Computer Science (FOCS), Symposium on Discrete Algorithms (SODA), International Colloquium on Automata, Languages and Programming (ICALP), International Conference on Communication (ICC), ACM Web Conference (WWW), Conference on Uncertainty in Artificial Intelligence (UAI).