

Ewin Tang

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EDUCATION

University of Washington

2018 – Present

PhD in Computer Science

Advisor: James Lee

University of Texas at Austin

2014 – 2018

Bachelor of Science in Computer Science

Bachelor of Science in Pure Mathematics

Thesis: A quantum-inspired classical algorithm for recommendation systems

Advisor: Scott Aaronson

PREPRINTS

Jeongwan Haah, Robin Kothari, and Ewin Tang. *Optimal learning of quantum Hamiltonians from high-temperature Gibbs states*. To appear in FOCS 2022, presented at QIP 2022. 2021. arXiv: 2108.04842 [quant-ph].

PUBLICATIONS

Ewin Tang. “Dequantizing algorithms to understand quantum advantage in machine learning”. In: *Nature Reviews Physics* (Sept. 2022). [Review article]. DOI: 10.1038/s42254-022-00511-w.

András Gilyén, Zhao Song, and Ewin Tang. “An improved quantum-inspired algorithm for linear regression”. In: *Quantum* 6 (June 2022), p. 754. DOI: 10.22331/q-2022-06-30-754. arXiv: 2009.07268 [cs.DS].

Nai-Hui Chia et al. “Sampling-based sublinear low-rank matrix arithmetic framework for dequantizing quantum machine learning”. In: *Journal of the ACM* (Aug. 2022). Appeared in STOC 2020, presented at QIP 2020. DOI: 10.1145/3549524. arXiv: 1910.06151 [cs.DS].

András Gilyén, Seth Lloyd, and Ewin Tang. “Quantum-inspired low-rank stochastic regression with logarithmic dependence on the dimension”. In: *31st International Symposium on Algorithms and Computation (ISAAC 2020)*. 2020. DOI: 10.4230/LIPIcs.ISAAC.2020.47. arXiv: 1811.04909 [cs.DS].

Ewin Tang. “Quantum principal component analysis only achieves an exponential speedup because of its state preparation assumptions”. In: *Phys. Rev. Lett.* 127 (6 Aug. 2021). Presented at QIP 2020 (joint with 1807.04271), p. 060503. DOI: 10.1103/PhysRevLett.127.060503. arXiv: 1811.00414 [cs.IR].

Ewin Tang. “A quantum-inspired classical algorithm for recommendation systems”. In: *Proceedings of the 51st Annual ACM SIGACT Symposium on Theory of Computing (STOC 2019)*. Presented in **plenary talk** at QIP 2020 (joint with 1811.00414). ACM Press, 2019. DOI: 10.1145/3313276.3316310. arXiv: 1807.04271 [cs.IR].

Sunita Chepuri, Neeraja Kulkarni, Joe Suk, and Ewin Tang. “Factorizations of k -nonnegative matrices”. In: *Journal of Combinatorics* 13.2 (2022), pp. 201–250. DOI: 10.4310/joc.2022.v13.n2.a2. arXiv: 1710.10867 [math.CO]. URL: <https://doi.org/10.4310/joc.2022.v13.n2.a2>.

INVITED TALKS

“Optimal learning of quantum Hamiltonians from high-temperature Gibbs states” [HKT21].

- MIT A+C seminar. *March 2022*
- Simons Institute Quantum Wave in Computing Reunion *July 2021*

Talks surveying quantum-inspired classical linear algebra algorithms:

- Perimeter Institute colloquium *October 2021*
- University of Illinois IQIST seminar series *April 2021*
- Simons Institute Quantum Colloquium *March 2021*
- Simons Quantum Algorithms workshop *February 2020*
- Simons Quantum Wave in Computing boot camp *January 2020*
- Santa Fe Institute workshop *July 2019*
- TQC (**plenary talk**) *June 2019*
- TCS+ *May 2019*
- CIFAR Quantum Information Systems Meeting *May 2019*
- Microsoft Research QuArC seminar *November 2018*

“A quantum-inspired classical algorithm for recommendation systems” [Tan19]

- Microsoft Research AI seminar *December 2018*
- UW Theory Seminar *October 2018*
- Quantum Cluster, Simons Institute (informal) *June 2018*

RECOGNITION

QIP 2020 Best Student Paper *2020*

For “Quantum-inspired algorithms for recommendation systems, principal component analysis, and supervised clustering” [Tan19; Tan21]

NSF Graduate Research Fellowship recipient *2019*

Forbes 30 Under 30 *2019*

Dean’s Honored Graduate *2018*

Research and academic distinction given to the top 1% of graduating students of UT College of Natural Sciences

Best Undergraduate Thesis *2018*

For “A quantum-inspired classical algorithm for recommendation systems”, selected from all undergraduate computer science honors students

SERVICE

QIP program committee *2022*

QIP program committee *2020*