CV – YASSINE HAMOUDI

OVERVIEW

- First/Last name: Yassine Hamoudi
- Postal address: Simons Institute for the Theory of Computing, Office 120, Melvin Calvin Laboratory, #2190, Berkeley, CA 94720, United States
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Research	My primary research interest is *quantum computing*. I study the impact of quantum mechanics on algorithm design and computational complexity theory. I have contributed to new quantum *algorithms* in diverse areas such as optimization, statistical analysis, streaming data, graph problems and cryptanalysis. I am also interested in new algorithmic and *lower-bound* methods for understanding the interplay between the computational resources available to quantum computers, with a particular focus on time-space tradeoffs.
Teaching	I was a teaching assistant (180 hrs) at Université de Paris during my PhD studies.

EMPLOYMENT

Postdoctoral researcher

- University of California, Berkeley – September 2021 to Today.
- *Simons Quantum Postdoctoral Fellow* hosted by Umesh Vazirani.

EDUCATION

Doctoral degree

- IRIF, Université de Paris, France – September 2017 to June 2021.
- Supervisors: Frédéric Magniez and Miklos Santha.
- PhD Thesis on "Quantum Algorithms for the Monte Carlo Method".

Bachelor's and Master's Degrees in Computer Science

- Ecole Normale Supérieure de Lyon, France – September 2013 to August 2017.
- Master's Thesis on "Communication Complexity", prepared at Carnegie Mellon University (United States) under the supervision of Anil Ada – January 2016 to June 2016.

PUBLICATIONS

Peer-reviewed conferences

- "A Sublinear-Time Quantum Algorithm for Approximating Partition Functions", In *Proceedings of the 34th Symposium on Discrete Algorithms (SODA)*, 2023. With Arjan Cornelissen. To appear.

- "Classical and Quantum Algorithms for Variants of Subset-Sum via Dynamic Programming", In *Proceedings of the 30th European Symposium on Algorithms (ESA)*, pages 6:1–6:18, 2022. With Jonathan Allcock, Antoine Joux, Felix Klingelhöfer and Miklos Santha. DOI: 10.4230/lipics.esa.2022.6.

- "Near-Optimal Quantum Algorithms for Multivariate Mean Estimation", Contributed talk at the *25th Conference on Quantum Information Processing (QIP)* and In *Proceedings of the 54th Symposium on Theory of Computing (STOC)*, pages 33–43, 2022. With Arjan Cornelissen and Sofiene Jerbi. DOI: 10.1145/3519935.3520045.

- "Quantum Sub-Gaussian Mean Estimator", In *Proceedings of the 29th European Symposium on Algorithms (ESA)*, pages 50:1–50:17, 2021. DOI: 10.4230/lipics.esa.2021.50.

- "Quantum Time-Space Tradeoff for Finding Multiple Collision Pairs", In *Proceedings of the 16th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC)*, pages 1:1–1:21, 2021. With Frédéric Magniez. DOI: 10.4230/lipics.tqc.2021.1. **"Outstanding Paper Award"**.

- "Quantum Chebyshev's Inequality and Applications", In *Proceedings of the 46th International Colloquium on Automata, Languages, and Programming (ICALP)*, pages 69:1–69:16, 2019. With Frédéric Magniez. DOI: 10.4230/lipics.icalp.2019.69.

- "Simultaneous Multiparty Communication Complexity of Composed Functions", In *Proceedings of the 43rd International Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 14:1–14:15, 2018. DOI: 10.4230/lipics.mfcs.2018.14.

Peer-reviewed journals

- "Preparing Many Copies of a Quantum State in the Black-Box Model", *Physical Review A*, volume 105, pages 062440, 2022. DOI: 10.1103/physreva.105.062440.

- "Quantum Algorithms for Hedging and the Learning of Ising Models", *Physical Review A*, volume 103, pages 012418, 2021. With Maharshi Ray, Patrick Rebentrost, Miklos Santha, Xin Wang and Siyi Yang. DOI: 10.1103/physreva.103.012418.

- "Quantum and Classical Algorithms for Approximate Submodular Function Minimization", *Quantum Information & Computation*, volume 19, pages 1325–1349, 2019. With Patrick Rebentrost, Ansis Rosmanis et Miklos Santha. DOI: 10.26421/qic19.15-16-5.

Preprints

- "Quantum-Classical Tradeoffs in the Random Oracle Model", 2022. With Qipeng Liu and Makrand Sinha. To appear.

TALKS

Invited talks and courses

- Invited speaker at the *American Physical Society (APS) March Meeting*, Las Vegas, United States, March 2023 (upcoming event).
- Lecturer at the Park City Mathematics Institute (PCMI) Graduate Summer School on Quantum Computation, Princeton, United States, July 2023 (upcoming event).

Conference talks

- *European Symposium on Algorithms (ESA)*, Hasso Plattner Institut, Germany, 7 September 2022 (virtual). Video: `https://youtu.be/EIO2dxqVQ8U`.
- *Symposium on Theory of Computing (STOC)*, Rome, Italy, 20 June 2022. Video: `https://youtu.be/DO0VreIL9so`.
- *European Symposium on Algorithms (ESA)*, Instituto Superior Técnico, Portugal, 7 September 2021 (virtual). Video: `https://youtu.be/dlvme3gUJcY`.
- *Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC)*, University of Latvia, 6 July 2021 (virtual). Video: `https://youtu.be/eXvznaL2d-M`.
- *International Colloquium on Automata, Languages and Programming (ICALP)*, University of Patras, Greece, 9 July 2019.
- *International Symposium on Mathematical Foundations of Computer Science (MFCS)*, University of Liverpool, United Kingdom, 27 August 2018.

Seminars

- *Stanford Theory Lunch*, Stanford University, United States, 9 June 2022.
- *Quantum Brainstorming Session*, Simons Institute for the Theory of Computing, United States, 19 November 2021.
- *GT Info-Quantique*, Laboratoire Bordelais de Recherche en Informatique (LaBRI), France, 9 November 2021 (virtual).
- *QuSoft Seminar*, Centrum Wiskunde & Informatica (CWI), Netherlands, 8 October 2021 (virtual).
- *Bristol QIT Seminar*, University of Bristol, United Kingdom, 4 March 2020.
- *Centre for Quantum Technologies Seminar*, National University of Singapore (NUS), Singapore, 6 March 2019.

Workshops

- *Quantum Algorithms and Complexity*, Institute for Quantum Computing (IQC), University of Waterloo, Canada, 25 October 2019.
- *Quantum Algorithms and Applications* (QUANTALGO), Centrum Wiskunde & Informatica (CWI), Netherlands, 18 September 2019.

- *Quantum Algorithms for Massive Data* (QUDATA), Institut de Recherche en Informatique Fondamentale (IRIF), France, 10 January 2019.
- *Journées Informatique Quantique* (JIQ), Laboratoire lorrain de recherche en informatique et ses applications (Loria), France, 8 November 2018.
- *Quantum Algorithms and Applications* (QUANTALGO), Institut de Recherche en Informatique Fondamentale (IRIF), France, 25 September 2018.

OTHER RESEARCH ACTIVITIES

Program committees and reviewer

- Program committee member: QTML 2022.
- Conference reviewer: FOCS 20,21; FSTTCS 20,21; ICALP 19,21,22; ITCS 20; MFCS 18,21,22; QIP 21,22,23; SAC 21; SoCG 22; SODA 21,22,23; STACS 21,23; TQC 22.
- Journal reviewer: Algorithmica, Discrete Mathematics & Theoretical Computer Science (DMTCS), IEEE Transactions on Computers (TC), International Journal of Quantum Information (IJQI), Quantum, Quantum Information & Computation (QIC).

Invited visits

- Columbia University, United States, October 2022.
- University of Bristol, United Kingdom, March 2020.
- University of Waterloo, Canada, October 2019.
- Centre for Quantum Technologies, Singapore, April–June 2017.
- Carnegie Mellon University, United States, January–June 2016.

Seminar organization

- Organizer of the group seminar "Algorithms and Complexity" at IRIF from 2017 to 2021. List of all sessions at: `https://www.irif.fr/en/seminaires/algocomp/`.

Co-developer of a question-answering system

- Development of a natural language question-answering system from 2014 to 2017. Project's website at: `http://projetpp.github.io/`. Acquired by LEXISTEMS in 2017.