

# CV – YASSINE HAMOUDI

## OVERVIEW

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- First/Last name: Yassine HAMOUDI
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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

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### Postdoctoral researcher .....

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

## EDUCATION

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### 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

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### Peer-reviewed conferences .....

- “A Sublinear-Time Quantum Algorithm for Approximating Partition Functions”,  
*Contributed talk at the 26th Conference on Quantum Information Processing (QIP)*, 2023.  
*Proceedings of the 34th Symposium on Discrete Algorithms (SODA)*, 2023.  
Arjan Cornelissen and Yassine Hamoudi.  
ArXiv: 2207.08643.
- “Classical and Quantum Algorithms for Variants of Subset-Sum via Dynamic Programming”,  
*Proceedings of the 30th European Symposium on Algorithms (ESA)*, 2022.  
Jonathan Allcock, Yassine Hamoudi, Antoine Joux, Felix Klingelhöfer and Miklos Santha.  
DOI: 10.4230/lipics.esa.2022.6. ArXiv: 2111.07059.
- “Near-Optimal Quantum Algorithms for Multivariate Mean Estimation”,  
*Contributed talk at the 25th Conference on Quantum Information Processing (QIP)*, 2022.  
*Proceedings of the 54th Symposium on Theory of Computing (STOC)*, 2022.  
Arjan Cornelissen, Yassine Hamoudi and Sofiene Jerbi.  
DOI: 10.1145/3519935.3520045. ArXiv: 2111.09787.
- “Quantum Sub-Gaussian Mean Estimator”,  
*Proceedings of the 29th European Symposium on Algorithms (ESA)*, 2021.  
Yassine Hamoudi.  
DOI: 10.4230/lipics.esa.2021.50. ArXiv: 2108.12172.
- “Quantum Time-Space Tradeoff for Finding Multiple Collision Pairs”,  
*Proceedings of the 16th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC)*, 2021. **“Outstanding Paper Award”**.  
Yassine Hamoudi and Frédéric Magniez.  
DOI: 10.4230/lipics.tqc.2021.1. ArXiv: 2002.08944.
- “Quantum Chebyshev’s Inequality and Applications”,  
*Proceedings of the 46th International Colloquium on Automata, Languages, and Programming (ICALP)*, 2019.  
Yassine Hamoudi and Frédéric Magniez.  
DOI: 10.4230/lipics.icalp.2019.69. ArXiv: 1807.06456.
- “Simultaneous Multiparty Communication Complexity of Composed Functions”,  
*Proceedings of the 43rd International Symposium on Mathematical Foundations of Computer Science (MFCS)*, 2018.  
Yassine Hamoudi.  
DOI: 10.4230/lipics.mfcs.2018.14. ArXiv: 1710.01969.

### Peer-reviewed journals .....

- “Preparing Many Copies of a Quantum State in the Black-Box Model”,  
*Physical Review A*, 2022.  
Yassine Hamoudi.  
DOI: 10.1103/physreva.105.062440. ArXiv: 2207.11014.

- “Quantum Algorithms for Hedging and the Learning of Ising Models”,  
*Physical Review A*, 2021.  
Yassine Hamoudi, Maharshi Ray, Patrick Rebentrost, Miklos Santha, Xin Wang and Siyi Yang.  
DOI: 10.1103/physreva.103.012418. ArXiv: 2002.06003.
- “Quantum and Classical Algorithms for Approximate Submodular Function Minimization”,  
*Quantum Information & Computation*, 2019.  
Yassine Hamoudi, Patrick Rebentrost, Ansis Rosmanis and Miklos Santha.  
DOI: 10.26421/qic19.15-16-5. ArXiv: 1907.05378.

## Preprints .....

- “Quantum-Classical Tradeoffs in the Random Oracle Model”,  
*In submission*, 2022.  
Yassine Hamoudi, Qipeng Liu and Makrand Sinha.  
ArXiv: 2211.12954.

## TALKS

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### 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/EI02dxqVQ8U>.
- *Symposium on Theory of Computing (STOC)*, Rome, Italy, 20 June 2022. Video: <https://youtu.be/D00VreIL9so>.
- *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

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### 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.