Mehrdad Tahmasbi

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ACADEMIC POSITIONS

Postdoctoral scholar (Future Faculty Fellow), University of Illinois Urbana-Champaign, Champaign, IL, United States 2023 -

Postdoctoral scholar, Tufts University, Medford, MA, United States 2022 - 2023

Postdoctoral scholar, Centrum Wiskunde & Informatica/University of Amsterdam, Amsterdam, Netherlands 2020 - 2022

EDUCATION

Doctor of Philosophy (PhD), Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA, 2015 - 2020
GPA: 4.00 / 4.00
Thesis: *Covert Communication: from classical channels to quantum channels*

Master of Science (MS), Mathematics, *Georgia Institute of Technology*, Atlanta, GA, 2015 - 2019
GPA: 4.00 / 4.00

Master of Science (MS), Electrical and Computer Engineering, *Georgia Institute of Technology*, Atlanta, GA, 2015 - 2018
GPA: 4.00 / 4.00

Bachelor of Science (BS), Electrical Engineering *Sharif University of Technology*, Tehran, Iran, 2010 - 2014
GPA: 17.92 / 20

Bachelor of Science (BS), Pure Mathematics *Sharif University of Technology*, Tehran, Iran, 2010 - 2014
GPA: 19.40 / 20

FIELDS OF INTEREST

Quantum information theory, Quantum crytography, Quantum complexity theory

HONORS AND AWARDS

The Illinois Quantum Information Science and Technology Center (IQUIST) postdoctoral scholarship

Georgia Tech Sigma Xi Best Ph.D. Thesis Award, 2021.

Graduate Research Assistant Excellence Award, School of ECE, Georgia Tech, 2019.

Silver Medal in International Olympiad in Informatics, Waterloo, Canada, September 2010.

Gold Medal in Iranian National Olympiad in Informatics, Tehran, Iran, March 2009.

Bronze Medal in Iranian National Physics Olympiad, Tehran, Iran, September 2009.

PUBLICATIONS

Postdoc Publications

1. S. Mehraban and **M. Tahmasbi**[1] "Improved bounds for testing low stabilizer complexity states," to be presented at *STOC 2025*, available at arxiv:2410.24202
2. S. Mehraban and **M. Tahmasbi**[2] "Quadratic Lower bounds on the Approximate Stabilizer Rank: A Probabilistic Approach," presented at *QIP 2024* and *STOC 2024*, available at arxiv:2305.10277
3. M. Bullock, A. Sheikholeslami, **M. Tahmasbi**, R. Macdonald, S. Guha, B. Bash Covert "Communication over Classical-Quantum Channels," to be published at *IEEE Transactions on Information Theory*, available at arxiv: 1601.06826
4. L. Farràs, J. Has, M. Ozol, C Schaffner, **M Tahmasbi**[3] "Parallel repetition of local simultaneous state discrimination", submitted to *Quantum*, available at arxiv:2211.06456.
5. C Majenz, C Schaffner, **M Tahmasbi**[4] "Limitations on Uncloneable Encryption and Simultaneous One-Way-to-Hiding", available at arxiv:2103.14510.
6. C Majenz, M Ozols, C Schaffner, **M Tahmasbi**[5] "Local Simultaneous State Discrimination", presented at *QIP* 2022, to be published in *Physical Review A*, available at arxiv:2111.01209.

Journal Papers

1. **M. Tahmasbi**, A. Shahrasbi and A. Gohari, "Critical Graphs in Index Coding," in *IEEE Journal on Selected Areas in Communications*, vol. 33, no. 2, pp. 225-235, Feb. 2015.
2. **M. Tahmasbi** and M. R. Bloch, "First and Second Order Asymptotics in Covert Communication," *IEEE Transactions on Information Theory*, vol. 65, no. 4, pp. 2190–2212, Apr. 2019.
3. **M. Tahmasbi** and M. R. Bloch, "Framework for Covert and Secret Key Expansion over Classical-Quantum Channels," *Physical Review A*, vol. 99, no. 5, p. 052329, May 2019
4. **M. Tahmasbi**, M. R. Bloch, "Covert Secret Key Generation with an Active Warden," *IEEE Transactions on Information Forensics and Security*, vol. 15, pp. 1026 - 1039, Aug. 2019.
5. **M. Tahmasbi**, M. R. Bloch and A. Yener, "Learning Adversary's Actions for Secret Communication," *IEEE Transactions on Information Theory*, vol. 66, no. 3, pp. 1607-1624, March 2020.
6. **M. Tahmasbi**, A. Savard and M. R. Bloch, "Covert Capacity of Non-Coherent Rayleigh-Fading Channels," *IEEE Transactions on Information Theory*, vol. 66, no. 4, pp. 1979-2005, Apr. 2020.
7. **M. Tahmasbi** and M. R. Bloch, "Covert and secret key expansion over quantum channels under collective attacks," IEEE Transactions on Information Theory, vol. 66, no. 11, pp. 7113–7131, Nov. 2020.
8. I. A. Kadampot, **M. Tahmasbi**, and M. R. Bloch, "Multilevel-Coded Pulse-Position Modulation for Covert Communications over Binary-Input Discrete Memoryless Channels," IEEE Transactions on Information Theory, vol. 66, no. 10, pp. 6001–6023, Oct. 2020.

[1]The authors order is alphabetical
[2]The authors order is alphabetical
[3]The authors order is alphabetical
[4]The authors order is alphabetical
[5]The authors order is alphabetical

9. **M. Tahmasbi** and M. R. Bloch, "Steganography Protocols for Quantum Channels," Journal of Mathematical Physics, vol. 61, no. 8, p. 082201, Aug. 2020.
10. **M. Tahmasbi** and M. R. Bloch, "Towards Undetectable Quantum Key Distribution over Bosonic Channels," IEEE Journal on Selected Areas in Information Theory, vol. 1, no. 2, pp. 585–598, Aug. 2020.
11. **M. Tahmasbi** and M. R. Bloch, "On Covert Quantum Sensing and the Benefits of Entanglement," IEEE Journal on Selected Areas in Information Theory, vol. 2, no. 1, pp. 352–365, Mar. 2021.

Conference Papers

1. **M. Tahmasbi**, A. Shahrasbi and A. Gohari, "Critical Graphs in Index Coding," in Proc. of *IEEE International Symposium on Information Theory*, Honolulu, HI, 2014, pp. 281-285.
2. **M. Tahmasbi** and F. Fekri, "On the Capacity Achieving Probability Measures for Molecular Receivers," in Proc. of *IEEE Information Theory Workshop*, Jeju, 2015, pp. 109-113.
3. **M. Tahmasbi** and M. R. Bloch, "Second-Order Asymptotics of Covert Communications over Noisy Channels," in Proc. of *IEEE International Symposium on Information Theory, Barcelona*, Spain, Jul. 2016, pp. 2224–2228.
4. **M. Tahmasbi** and M. R. Bloch, "Second-Order Asymptotics for Degraded Wiretap Channels: How Good Are Existing Codes?," in *54th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, Sep. 2016, pp. 830–837.
5. **M. Tahmasbi**, M. R. Bloch and A. Yener, "Learning Adversary's Actions for Secret Communication," in Proc. of *IEEE International Symposium on Information Theory*, Aachen, Germany, Jun. 2017, pp. 2713–2717.
6. K. S. Kumar Arumugam, I. A. Kadampot, **M. Tahmasbi**, S. Shah, M. Bloch and S. Pokutta, "Modulation Recognition Using Side Information and Hybrid Learning," in Proc. *IEEE Int. Symp. Dynamic Spectrum Access Networks (DySPAN)*, Piscataway, NJ, Mar. 2017, pp. 1–2.
7. **M. Tahmasbi**, M. R. Bloch and V. Y. F. Tan, "Error Exponent for Covert Communications over Discrete Memoryless Channels," in Proc. of *IEEE Information Theory Workshop*, Kaohsiung, Taiwan, Nov. 2017, pp. 304–308.
8. **M. Tahmasbi** and M. R. Bloch, "Covert Secret Key Generation," in Proc. of *IEEE Conference on Communications and Network Security, Workshop on Physical-Layer Methods for Wireless Security*, Las Vegas, NV, Oct. 2017, pp. 540–544.
9. I. A. Kadampot, **M. Tahmasbi** and M. R. Bloch, "Multilevel-Coded Pulse-Position Modulation for Covert Communications," in Proc. of *IEEE International Symposium on Information Theory*, Vail, CO, Jun. 2018, pp. 1864–1868.
10. I. A. Kadampot, **M. Tahmasbi**, and M. R. Bloch, "Codes for Covert Communication over Additive White Gaussian Noise Channels," in Proc. of *IEEE International Symposium on Information Theory*, Paris, France, Jul. 2019, pp. 977–981.
11. **M. Tahmasbi** and M. Bloch, "Steganography Protocols for Quantum Channels," in Proc. of *IEEE International Symposium on Information Theory*, Paris, France, Jul. 2019, pp. 2179–2183.

12. **M. Tahmasbi**, M. Bloch, and A. Yener, "In-Band Sensing of the Adversary's Channel for Secure Communication in Wireless Channels." in Proc. of *IEEE International Symposium on Information Theory*, Paris, France, Jul. 2019, pp. 2184–2188.
13. **M. Tahmasbi** and M. Bloch, "Covert Communication with Unknown Code at Warden," to be appeared in Proc. of *Annual Allerton Conference on Communication, Control, and Computing (Allerton).*
14. **M. Tahmasbi** and M. R. Bloch, "Active Covert Sensing," in Proc. of IEEE International Symposium on Information Theory, Los Angeles, CA, Jun. 2020, pp. 840–845.

TEACHING EXPERIENCES

Teaching Quantum Information in TCS (**UIUC**)
Teaching staff for Prob & Stat for Computer Sci (**UIUC**)
Teaching Quantum Information & Communication (**University of Amsterdam**)
TA for Information Theory (**University of Amsterdam**)
TA for Statistical Machine Learning (**Georgia Tech**)
TA for Probability and Statistics (**Georgia Tech**)
TA for Wireless Communication (**Georgia Tech**)
TA for Adaptive Filtering (**Georgia Tech**)
TA for Computer Structure and Microprocessor
TA for Communication Systems
TA for Digital Signal Processing
TA for Mathematical Analysis 1
TA for Advanced Programming (JAVA)
Part-time Teacher at Allemeh Helli High School Teaching Graph Theory

MENTORING

Jonas Has (undergraduate student at University of Amsterdam)

REVIEWER

Journals

IEEE Transactions on Information Theory
IEEE Transactions on Forensics and Security
IEEE Transactions on Communications
IEEE Transactions on Wireless Communication
IEEE Transactions on Molecular, Biological, and Multi-Scale Communications
Advances in Mathematics of Communications
Journal of Selected Topics in Signal Processing
International Journal of Communication Systems

Conferences

IEEE International Symposium on Information Theory 2016, 2017, 2018, 2019
IEEE Information Theory Workshop 2017
IEEE Wireless Communications and Networking Conference 2018
The International Symposium on Information Theory and Its Applications 2018
Eurocrypt 2021
QIP 2022, 2023
STOC 2024

COMPUTER SKILLS

Programming Languages: C++, MATLAB, R, Python
Operating Systems: Mac, Linux (Ubuntu), Windows

REFERENCES

Matthieu Bloch
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Georgia Institute of Technology
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