

Mohamed (Seif) Mohamed

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🇺🇸 U.S. Permanent Resident

About Me

Research engineer specializing in privacy-preserving and communication-efficient AI systems for large-scale distributed networks. My work combines distributed learning, graph analytics, and generative AI to enable scalable edge intelligence and trustworthy AI deployment. Co-inventor of two pending U.S. patents and author of 35+ peer-reviewed publications in top-tier venues (ICML, ACL, IEEE JSAC, T-IFS, TSP, ISIT, ICC, Globecom, DySPAN).

Core Expertise

- Privacy-preserving & Communication-efficient Machine Learning
- Wireless Communications & Signal Processing
- Statistical Learning on Graphs & Network Data
- Generative AI & Trustworthy AI Systems





Employment & Research Experience

Princeton University Researcher, Wireless Systems Lab Host: Dr. Andrea J. Goldsmith, and Dr. H. Vincent Poor	NJ, USA Jun 2022 - present
Nokia Bell Labs Visiting Researcher, Artificial Intelligence Research Lab Host: Dr. Iraj Sainne	NJ, USA Sep 2024 - Oct 2024
The University of Arizona Graduate Research Assistant, Wireless Network and Cyber Security Research Lab Advisors: Dr. Ravi Tandon, and Dr. Ming Li	AZ, USA Jan 2017 - May 2022
Nile University Graduate Research Assistant, Wireless Intelligent Networks Center Advisors: Dr. Karim Seddik, Dr. Amr El-keyi, and Dr. Mohammed Nafie	Giza, Egypt Oct 2014 - Dec 2016
Egypt-Japan University of Science and Technology Undergraduate Research Intern, Wireless Research Center Advisor: Dr. Moustafa Youssef	Alexandria, Egypt Jun 2013 - Oct 2013 Jul 2014 - Aug 2014
Alexandria University Undergraduate Research Assistant, Electrical Engineering Department Advisor: Dr. Essam Sourour	Alexandria, Egypt Oct 2013 - Jul 2014

Education

Ph.D. The University of Arizona , Electrical and Computer Engineering • Minor: Systems and Industrial Engineering • Dissertation: Security and Privacy in Information Systems: Algorithms and Fundamental Limits	AZ, USA May 2022
M.Sc. Nile University , Communications and Information Technology • Thesis: Interference Management in Spectrally and Energy Efficient Wireless Networks	Giza, Egypt Aug 2016
B.Sc. Alexandria University , Electrical Engineering - Communications Section • Graduation Project: Baseband Physical Layer Implementation of Software Defined Radio - WiFi 802.11 ac & LTE release 10 (🏆 Best Graduation Project)	Alexandria, Egypt Jul 2014

Selected Publications

- Complete list of publications can be found [here](#) 
- 1. **Mohamed Seif**, Yasaman Ghasempour, H. Vincent Poor, Doru Calin, and Andrea Goldsmith, “Protecting Human Activity Signatures in Compressed IEEE 802.11 CSI Feedback”, *IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, 2026
- 2. Hojjat Vavidan, **Mohamed Seif**, H. Vincent Poor, Ingrid Moreman, and Adnan Shahid, “Closed-loop Intelligence using Large Language Models in Wireless Networks,”, *Proceedings of the 2025 IEEE/IFIP Wireless and Mobile Networking Conference (WMNC)*, 2025 ( **Demo Paper**)
- 3. **Mohamed Seif**, Liyan Xie, Andrea Goldsmith, and Vincent Poor, “Differentially Private Online Community Detection for Censored Block Models: Algorithms and Fundamental Limits”, *IEEE Transactions on Information Forensics & Security*, 2025
- 4. **Mohamed Seif**, Yuqi Nie, Andrea Goldsmith, and Vincent Poor, “Collaborative Inference over Wireless Channels with Feature Differential Privacy”, *IEEE Journal of Selected Areas in Communications*, Special Issue on Intelligent Communications for Real-Time Computer Vision (Comm4CV), 2025
- 5. Joohyung Lee, **Mohamed Seif**, Jungchan Cho, and H. Vincent Poor, "Optimizing Privacy and Latency Tradeoffs in Split Federated Learning over Wireless Networks: A Joint Cut Layer Selection and Differential Privacy Approach", *IEEE Wireless Communication Letters*, 2024
- 6. Rajarshi Saha, **Mohamed Seif**, Andrea Goldsmith, and Vincent Poor, “Privacy Preserving Semi-Decentralized Mean Estimation over Intermittently-Connected Networks”, *IEEE Transactions on Signal Processing*, 2024
- 7. **Mohamed Seif**, Yanxi Chen, Andrea Goldsmith, and Vincent Poor, “Differentially Private Sketch-and-Solve for Community Detection via Semidefinite Programming”, *IEEE Journal of Selected Areas in Information Theory*, Special Issue on Information-Theoretic Methods for Trustworthy and Reliable Machine Learning, 2024
- 8. Bo Jiang, **Mohamed Seif**, Ravi Tandon and Ming Li, “Answering Count Query for Genomic Data under Perfect Privacy”, *IEEE Transactions on Information Forensics & Security*, 2023
- 9. **Mohamed Seif**, Wei-Ting Chang, and Ravi Tandon, “Privacy Amplification for Federated Learning via User Sampling and Wireless Aggregation”, *IEEE Journal of Selected Areas in Communications*, Special Issue on Distributed Learning over Wireless Edge Networks, 39 (12): 3821-3835, 2021.
- 10. Bo Jiang*, **Mohamed Seif***, Ravi Tandon, and Ming Li, “Context-Aware Local Information Privacy”, *IEEE Transactions on Information Forensics & Security*, vol. 16: 3694-3708, 2021 (***:co-first authors, alphabetical order**)
- 11. **Mohamed Seif**, Dung Nguyen, Anil Vullikanti, and Ravi Tandon, “Differentially Private Community Detection for Stochastic Block Models”, *International Conference on Machine Learning (ICML)*, 2022 ( **Spotlight Presentation**)
- 12. **Mohamed Seif**, Ravi Tandon, and Ming Li, “Wireless Federated Learning with Local Differential Privacy”, *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, 2020 ( **Best Poster Award, Graduate Poster Symposium**)
- Pending Papers (under review):
 1. Liyan Xie, Muhammad Siddeek, **Mohamed Seif**, Andrea Goldsmith, and Mengdi Wang, “Detecting Post-generation Edits to Watermarked LLM Outputs via Combinatorial Watermarking”, *Conference on Language Modeling (COLM)*, 2026
 2. Hojjat Navidan, Mohammad Cheraghinia, Jaron Fontaine, **Mohamed Seif**, Eli De Poorter, H Vincent Poor, Ingrid Moreman, and Adnan Shahid, “Toward Autonomous O-RAN: A Multi-Scale Agentic AI Framework for Real-Time Network Control and Management”, *IEEE Network*, 2026
- Patents:
 1. Liyan Xie, **Mohamed Seif**, Mengdi Wang, and Andrea Goldsmith, “Watermarking and Post Edits Detection in Large Language Models”, 2025 (filed)
 2. **Mohamed Seif**, Andrea Goldsmith, and Vincent Poor, “Privacy-preserving AI over Next Generation Networks”, U.S. Patent Application, No. 63/544,870, 2023 (filed)

Honors and Awards

- Invited Talk, 60th Annual **Allerton** Conference on Communication, Control, and Computing Sep 2024
- Invited Talk, 2023 **INFORMS** Annual Meeting (🏆 **Community Choice**) Oct 2023
- **Spotlight** Presentation, International Conference on Machine Learning (**ICML**) July 2022
- Full Participation Grant Award, **ICML** July 2022
- Best Poster Award, ECE Department, **The University of Arizona** Mar 2020
- North American School of Information Theory Travel Grant, **Boston University** Jul 2019
- Travel Grant Award, College of Engineering, **The University of Arizona** May 2018
- Best Graduation Project Award, EE Department, **Alexandria University** Aug 2014
- **Vodafone** Sponsorship for B.Sc. graduation project, **Alexandria University** Aug 2013
- Academic Distinction Award, **Alexandria University** 2011 – 2014

Selected Recent Talks

- Talk, IEEE International Symposium on Spectrum Innovation (**DySPAN**), Washignton, D.C. May 2026
- Guest Lecture, Computer Science Department, **Georgia Southern University** April 2026
- Talk, IEEE International Symposium on Information Theory (**ISIT**), Ann Arbor, MI Jun 2025
- Colloquium, Electrical Engineering and Computer Science Department, **Syracuse University** Mar 2025
- Colloquium, Industrial and Systems Engineering Department, **Texas A & M University** Feb 2025
- Colloquium, Electrical and Computer Engineering Department, **Johns Hopkins University** Jan 2025
- Invited Talk, Electrical Engineering Department, **Stanford University** Nov 2024
- Invited Talk, Wireless Systems Research Lab, **Intel** Oct 2024
- Talk, **Asilomar** Conference on Signals, Systems, and Computers, Pacific Grove, CA Oct 2024
- Invited Talk, Artificial Intelligence Research Lab, **Nokia Bell Labs** Sep 2024
- Talk, University Center of Excellence (UCoE) Meeting, **U.S. Air Force Research Laboratory (AFRL)** Aug 2024
- Invited Talk, Computer Science and Engineering Department, **University of North Texas** Apr 2024
- Invited Talk, Computer Engineering Department, **San Jose State University** Mar 2024
- Invited Talk, **INFORMS** Annual Meeting Oct 2023

Grant Writing Experience

1. “Identifying and Mitigating Privacy Threats in ISAC” (⌚ **under progress**) 2026
2. “Trustworthy Generative AI for NextG Information Systems” (⌚ **under progress**) 2025
3. “Frequency-agile and -heterogeneous IoT networks”, **BARI: Bilateral Academic Research Initiative** 2024
4. “Toward Privacy-preserving and Reliable Federated Learning for 6G Systems”, ODFR: Innovation Fund for New Industrial Collaborations, **MediaTek** and **Princeton University** 2024
5. “Graph Mining and Network Science with Differential Privacy: Efficient Algorithms and Fundamental Limits”, Secure and Trustworthy Cyberspace (SaTC), **U.S. National Science Foundation (NSF)** (💰 **Awarded \$1.2 Million**) 2022
6. “Context Aware Privacy: Foundations, Algorithms and Applications”, SaTC, **U.S. NSF** 2021

Teaching Experience

- ECE 539B: Special Topics in Information Sciences and Systems, **Princeton University** Spring 2023
- ECE 696B - 310: Advanced Topics in Machine Learning and Applications, **The University of Arizona** Spring 2021
- ECE 696B: Advanced Topics in Security, **The University of Arizona** Fall 2020
- MENG 512: Signals and Systems, **Nile University** Fall 2016

Mentorship and Advising

- Yuqi Nie, Princeton University (now at NovaQuant)
- Yanxi Chen, Princeton University (now at Alibaba Group)
- Atsutse Kludze, Princeton University
- Ashlynn Crisp, Portland State University
- Zewei Deng, University of Minnesota
- Faranak Solat, Gachon University (now at Sejong University)
- Rajarshi Saha, Stanford University (now at Amazon AWS)
- Merkebu Tekaw Girmay, Ghent University–imec (now at OAI Foundation)
- Mostafa Naseri, Ghent University–imec
- Hojjat Navidan, Ghent University–imec

Service

Guest Editor:

Entropy, Special Issue on Information-Theoretic Security and Privacy 2024–2026

Session Chair:

IEEE CISS 2024

TPC Member:

IEEE ICC 2026

IEEE ICNC 2025

IEEE GLOBECOM 2022–2026

Technical Reviewer: [\(Complete List\)](#)

Conferences: NeurIPS, ICML, AISTATS, GLOBECOM, ISIT, INFOCOM 2015–present

Journals: ComMag, JSAC, JSAIT, T-IFS, T-IT 2017–present

Selected Courses

Information Theory, Non-linear Optimization, Convex Optimization, Engineering Statistics, Optimization for Machine Learning, Detection and Estimation Theory, Wireless Communications, Digital Communication Systems, Communication Networks

Technical Skills

Programming: Python, MATLAB

Machine Learning & AI: PyTorch, scikit-learn, NumPy, SciPy, LLMs, Generative AI, Federated Learning, Edge AI

Privacy & Optimization: Differential Privacy, Gurobi, CVX

Wireless & Signal Processing: MIMO, OFDM, 5G NR fundamentals, Wi-Fi (802.11ac/ax), CSI feedback, beamforming