Mehdi Zafari

Ph.D. Candidate, UC Irvine

Signal processing and AI/ML for next-generation (5G/6G) wireless systems

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Updated October 2026

Education



Ph.D. in Electrical Engineering and Computer Science

June 2024 – December 2028, expected

University of California, Irvine, CA, USA

GPA: 4/4

Advisor: Prof. A. Lee Swindlehurst



M.S. in Electrical and Computer Engineering

August 2021 – May 2024

Rice University, Houston, TX, USA

GPA: 3.92/4

Thesis: Distributed Multi-User Beamforming in the Presence of CFO: An Analytical and Experimental Study



B.S. in Electrical and Computer Engineering

September 2015 – September 2019

University of Tehran, Tehran, Iran

GPA: 3.7/4

Thesis: Design and Hardware Implementation of a MIMO-OFDM System Using High-Level Synthesis Techniques

Research interests

Wireless communications	Cell-Free MIMO, Integrated Sensing and Communication, Resource Allocation, Beamforming
ML and optimization	AI/ML for Wireless, Distributed Optimization, Generative AI for Sensing and Wildfire Prediction

Experience

Jul 2024 – present

Graduate Student Researcher

EECS, UC Irvine

- Conduct research on reinforcement learning and graph neural network (GNN)-based models for cooperative ISAC networks
- Design distributed algorithms based on ADMM/consensus for beamforming and resource allocation in cell-free ISAC systems
- Develop large-scale network simulations and implement optimization/learning pipelines using Python/PyTorch, CVXPY, Gurobi
- Supervisor: Prof. A. Lee Swindlehurst

Jun – Sep 2026

Wireless AI Engineering Intern

Tiami Networks, Sacramento, CA

- Investigated ISAC channel models and constructed high-fidelity RF digital twins using NVIDIA Sionna and ray-tracing engines
- Analyzed spatial propagation characteristics to optimize sensing algorithms and facilitate integration with Open RAN architectures

Aug 2021 – Apr 2024 **Graduate Research Assistant** ECE, Rice University

- Conducted research on distributed multi-user MIMO beamforming for next-generation wireless networks
- Performed over-the-air experiments using the RENEW massive MIMO testbed to evaluate distributed multi-user beamforming
- Published four research papers and released over 200 datasets collected via the RENEW platform
- Datasets: Distributed Multi-User MIMO Datasets on IEEE DataPort
- Supervisor: Dr. Rahman Doost-Mohammady

Jan – Apr 2024 **Research Fellow** Rice D2K Lab

- Mentored five undergrad students on a Rice EMS-sponsored project to analyze operational data across multiple domains
- Developed time-series prediction models to anticipate future requirements in each area

Dec 2018 – Dec 2020 **Undergraduate Research Assistant** Array Processing Lab, University of Tehran

- Conducted research on the hardware implementation of MIMO OFDM systems using the Xilinx ZedBoard platform
- Designed full-stack OFDM system, from theoretical modeling in MATLAB/Python to hardware implementation via Vivado-HLS
- Developed OFDM and SC-FDE systems on Xilinx FPGAs using High-Level Synthesis (HLS)
- Supervisor: Dr. Aliazam Abbasfar

May – Nov 2020 **Part-Time R&D Engineer** Transportation Innovation Center, Tehran

- Designed and implemented hybrid radio links (FM analog and OFDM digital) for radio-controlled camera drones
- Researched telemetry system implementation strategies for vehicular communication in drone networks

May – Nov 2020 **Part-Time R&D Engineer** Sadr Electronic Dena, Tehran

- Developed a 2.4GHz ISM band IoT system to enable remote control functionality for elevator central control boards
- Engineered embedded C/C++ firmware for AVR and ARM microcontrollers with serial data transmission protocols

Jul – Oct 2018 **Full-Time Intern** Pionaria, Tehran

- Simulated parabolic and patch antennas in HFSS and CST, improving VSWR and gain
- Implemented point-to-point and point-to-multipoint wireless links using wireless network standards and software-defined radio (SDR) concepts

Publications

Journal and magazine papers

CORDIS: A Scalable Coordinated Resource Allocation Framework for Distributed Cell-Free ISAC

M. Zafari, B. Ottersten, and A. L. Swindlehurst

IEEE TWC Submitted to IEEE Transactions on Wireless Communications

Under review

Robust Wildfire Forecasting under Partial Observability: From Reconstruction to Prediction

C. Yang, **M. Zafari**, Z. Duan, and A. L. Swindlehurst

IEEE TGRS — Submitted to IEEE Transactions on Geoscience and Remote Sensing

Under review

Multi-Domain Optimization Framework for ISAC: From Electromagnetic Shaping to Network Cooperation

R. Liu, M. Li, **M. Zafari**, B. Ottersten, and A. L. Swindlehurst

IEEE WCM — IEEE Wireless Communications (magazine)

An Analytical and Experimental Study of Distributed Uplink Beamforming in the Presence of Carrier Frequency Offsets

M. Zafari, D. Pandey, and R. Doost-Mohammady

IEEE TVT — IEEE Transactions on Vehicular Technology

Conference papers

Feasible but Not Safe: Constraint Violations and Report-Channel Attacks in Learned Cell-Free ISAC Association

M. Zafari, I. Mohammadi, and A. L. Swindlehurst

MobiCom 2026 S3 — 17th ACM Workshop on Wireless of the Students, by the Students, and for the Students (S3 '26), co-located with ACM MobiCom 2026

Accepted

TiamiTwin: A Digital Twin for Bistatic ISAC Drone Sensing, Validated Against Measurements

M. Zafari, S. Enayati, A. L. Swindlehurst, and A. Mukherjee

MILCOM 2026 Workshop — IEEE MILCOM 2026 Workshop on Integrated Sensing and Communication for Critical Infrastructure Protection (ISAC4CIP)

Accepted

ASSENT: Learning-Based Association Optimization for Distributed Cell-Free ISAC

M. Zafari and A. L. Swindlehurst

ICC 2026 — IEEE International Conference on Communications (ICC)

Coordinated Decentralized Resource Optimization for Cell-Free ISAC Systems

M. Zafari, R. Liu, and A. L. Swindlehurst

Asilomar 2025 — 59th Asilomar Conference on Signals, Systems, and Computers

Best Paper Award Finalist

ADMM for Downlink Beamforming in Cell-Free Massive MIMO Systems

M. Zafari, D. Pandey, R. Doost-Mohammady, and C. A. Uribe

Asilomar 2024 — 58th Asilomar Conference on Signals, Systems, and Computers

ML-Based Feedback-Free Adaptive MCS Selection for Massive Multi-User MIMO

Q. An, **M. Zafari**, C. Dick, S. Segarra, A. Sabharwal, and R. Doost-Mohammady

Asilomar 2023 — 57th Asilomar Conference on Signals, Systems, and Computers

Robustness of Distributed Multi-User Beamforming: An Experimental Evaluation

R. Doost-Mohammady, **M. Zafari**, and A. Sabharwal

SAM 2022 — IEEE 12th Sensor Array and Multichannel Signal Processing Workshop (SAM)

Datasets and software

3gpp-tr-library: Hand-verified, section-level 3GPP Technical Reports as queryable Markdown, CSV and YAML

M. Zafari

GitHub GitHub repository and the tr3gpp Python package on PyPI, archived on Zenodo

Deep-Gen-Project: Spatiotemporal Generative Models for Wildfire Spread Prediction

M. Zafari, E. Finkelstein, and C. Yang

GitHub GitHub repository

ASSENT-CellFree-ISAC: Simulation Framework

M. Zafari

GitHub GitHub repository

Distributed Cell-Free ISAC Simulation Framework

M. Zafari

GitHub GitHub repository

Distributed Multi-User MIMO Datasets

M. Zafari

IEEE DataPort IEEE DataPort

Talks

Oct 2026 Workshop talk

Feasible but Not Safe: Constraint Violations and Report-Channel Attacks in Learned Cell-Free ISAC Association

17th ACM Workshop on Wireless of the Students, by the Students, and for the Students (S3 '26) at ACM MobiCom 2026, Austin, TX

Oct 2026 Lecture

CORDIS-Track: Tracking-Aware Coordinated Resource Allocation for Distributed Cell-Free ISAC

60th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA

Oct 2026 Workshop talk

TiamiTwin: A Digital Twin for Bistatic ISAC Drone Sensing, Validated Against Measurements

IEEE MILCOM 2026 Workshop on Integrated Sensing and Communication for Critical Infrastructure Protection (ISAC4CIP), Rockville, MD

Joint work with Tiami Networks.

Mar 2026 Competition talk

When Wireless Signals Become Our Eyes

UCI Grad Slam finals, Irvine, CA

3rd place.

Oct 2025 Lecture

Coordinated Decentralized Resource Optimization for Cell-Free ISAC Systems

59th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA

Best Paper Award finalist; also presented a poster in the Student Paper Contest.

Oct 2024 **Lecture**

ADMM for Downlink Beamforming in Cell-Free Massive MIMO Systems

58th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA

Oct 2023 **Poster**

ML-Based Feedback-Free Adaptive MCS Selection for Massive Multi-User MIMO

57th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA

Sep 2023 **Poster**

Distributed optimization for beamforming in massive MIMO systems

Texas Colloquium on Distributed Learning (TL;DR 2023), Rice University, Houston, TX

Jan 2023 **Project presentation**

DNN-based feedback-free adaptive modulation for massive MIMO

POWDER-RENEW Mobile and Wireless Week, University of Utah, Salt Lake City, UT

1st prize for the project.

Honors and awards

2026	**Wireless History Foundation Scholarship Award**	Wireless History Foundation
2026	**Pia Gratton Endowed Graduate Student Award**	UC Irvine
2026	**1st Place, UCI EECS Annual Technology Showcase**	UC Irvine
2026	**3rd Place, UCI Grad Slam Competition**	UC Irvine
2025	**Best Paper Award Finalist, 59th Asilomar Conference**	IEEE Asilomar Conference
2024	**Graduate Dean's Recruitment Fellowship Award**	UC Irvine
2022, 2023	**SIAWE Scholarship Award for Distinguished International Students** Society of Iranian-American Women for Education (SIAWE).	Rice University
2023	**1st Prize, POWDER-RENEW Mobile and Wireless Week**	University of Utah
2021	**Rice University Graduate Fellowship**	Rice University
2019	**Exceptional Talent Award** Top 5% GPA.	University of Tehran
2016	**National Elites Foundation Fellowship**	Iranian National Elites Foundation
2015	**Ranked 47th, Iranian National University Entrance Exam (Konkoor)**	
2013	**Ranked 3rd, Iranian National Mathematics Olympiad**	

Service

2024–2026 — **Peer reviewer**

- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Geoscience and Remote Sensing (TGRS)
- IEEE Transactions on Aerospace and Electronic Systems (TAES)
- IEEE Wireless Communications Letters (WCL)
- IEEE Signal Processing Letters (SPL)
- IEEE Communications Magazine

Teaching

Fall 2026	**Introduction to Control Systems + Lab** EECS 160A/LA	UC Irvine
Spring 2025	**Introduction to Digital Logic Laboratory**	UC Irvine
Spring 2024	**Applied Machine Learning & Data Science**	Rice University
Fall 2023	**Modern Communication: Theory and Practice**	Rice University
Fall 2022	**Modern Communication: Theory and Practice**	Rice University
Spring 2020	**Wireless Multimedia Communications**	University of Tehran
Fall 2019	**Signals and Systems Analysis**	University of Tehran
Spring 2019	**Digital Communications**	University of Tehran

Teaching assistant for every course listed.

Skills

Key skills	Wireless Communications, Signal Processing, Optimization, Applied Machine Learning
Programming	C++, Python, TensorFlow, PyTorch, CVXPY, Gurobi, MATLAB, Verilog
Software-defined radios	USRP B210/X410, NVIDIA Aerial, GNU Radio, Iris SDR, Agora
Simulation tools	NVIDIA Sionna, Ray-Tracing Engines, ns-3, Wireshark, Ansys HFSS, Simulink
Embedded and FPGA	ARM STM32, DSP, Atmel AVR, Xilinx ZedBoard, Vivado HLS

Relevant coursework

Fall 2025	**Deep Generative Models** Grade: A	UC Irvine
Fall 2024	**Machine Learning for Signal Processing** Grade: A+	UC Irvine
Spring 2024	**Optimization: Algorithms, Complexity, & Approximations** Grade: A	Rice University
Spring 2023	**Distributed Methods for Optimization and Machine Learning** Grade: A+	Rice University

Fall 2022	**Machine Learning (Introduction to Deep Learning)** Grade: A	Rice University
Spring 2022	**Advanced Wireless Networks** Grade: A	Rice University
Fall 2021	**Modern Communication: Theory and Practice** Grade: A	Rice University
Fall 2017	**Advanced Object-Oriented Programming** Grade: A	University of Tehran

Selected conferences and workshops

Oct 2026	**ACM International Conference on Mobile Computing and Networking (MobiCom)**	Austin, TX
Oct 2026, 2025, 2024, 2023	**Asilomar Conference on Signals, Systems, and Computers**	Pacific Grove, CA
Oct 2026	**IEEE Military Communications Conference (MILCOM)**	Rockville, MD
Oct 2025	**IEEE Military Communications Conference (MILCOM)**	Los Angeles, CA
Sep 2023	**Texas Colloquium on Distributed Learning**	Houston, TX