YASAMAN GHASEMPOUR

GENERAL

Email: ghasempour@rice.edu
Phone: +1 (713) 503-9091
Address: 6100 Main St., MS 366, Houston, TX 77005
Website: https://www.yghasempour.rice.edu/
Google Scholar Profile
LinkedIn Profile

EDUCATION

Ph.D. Candidate, Rice University May 2016 - May 2020 (Expected)
Electrical and Computer Engineering
GPA: 4.17/4.0
Thesis: Sensing-Assisted mmWave and THz Communications for High-Rate Applications and Dense Networks
Committee: Edward W. Knightly (*Chair*), Ashutosh Sabharwal, Lin Zhong, Nathan Dautenhahn

M.S., Rice University Aug. 2014 - May 2016
Electrical and Computer Engineering
GPA: 4.03/4.0
Thesis: Scaling 60 GHz WLANs: Creating and Identifying Opportunities for Multi-User Transmission
Committee: Edward W. Knightly (*Chair*), Behnaam Aazhang, Aydin Babakhani

B.Sc., Sharif University of Technology Aug. 2010 - May 2014
Electrical Engineering
GPA: 3.83/4.0

RESEARCH OBJECTIVE

My research interests lie at the intersection of wireless networking and wireless sensing with a focus on millimeter-wave and terahertz bands. In particular, I design and develop mathematical foundations, node architectures, and custom-built testbeds in order to realize joint communication and sensing in mmWave and THz spectrum. My work offers a solid foundation for a broad scope of applications including wireless security, scaling to high client densities, autonomous drones, and high-resolution passive motion sensing.

RESEARCH EXPERIENCE

Research Assistant, Rice University Aug. 2014 - Present
Under Supervision of Prof. Edward Knightly
Contributions:

- Design and development of the first single-shot single-antenna motion tracking system for THz networks
- The first experimental demonstration of multi-user MIMO in the mmWave spectrum
- Design and hardware implementation of a first-of-its-kind mmWave path sensing platform that repurposes the built-in antenna arrays, channel sparsity, and GHz-scale sampling rate to discover all high-rate paths
- Development of the first programmable and highly-configurable 60 GHz software defined radio testbed
- Design and implementation of novel user and beam selection strategies in multi-stream mmWave networks
- Design and prototyping the first light-controlled radio system that exploits light intensity measurements from off-the-shelf sensors to adapt directional 60 GHz beams

Research Intern, NEC Labs America May 2016 - Aug. 2016
Under Supervision of Dr. Prasad and Dr. Khojastepour
Contributions:

- Casting a downlink MU-MIMO scheduling problem as a difference of submodular set functions
- Optimizing the beam parameters to maximize the number of concurrent links in 5G cellular networks

PUBLICATIONS

[1] **Y. Ghasempour**, R. Shrestha, A. Charous, E. Knightly, and D. Mittleman, "Single Shot Link Discovery for Terahertz Wireless Networks," under review for publication in *Nature Communications*.

[2] **Y. Ghasempour**, C. Yeh, R.Shrestha, D. Mittleman, E. Knightly, "Single Shot Single Antenna Path Discovery in THz Networks," to appear in *ACM MobiCom*, 2020 *(acceptance rate: 17.2%)*.

[3] **Y. Ghasempour**, M.K. Haider, E. Knightly, "Multi-User Multi-Stream mmWave WLANs with Efficient Path Discovery and Beam Steering," in *IEEE Journal on Selected Areas in Communications (JSAC)*, 2019.

[4] S.K. Saha, **Y. Ghasempour**, M.K. Haider, T. Siddiqui, P. De Melo, N. Somanchi, L. Zakrajsek, A. Singh, O. Torres, D. Uvaydov, J.M. Jornet, "X60: A Programmable Testbed for Wideband 60 GHz WLANs with Phased Arrays," *Computer Communications*, 2019.

[5] **Y. Ghasempour**, M.K. Haider, E. Knightly,"Decoupling Beam Steering and User Selection for MU-MIMO 60 GHz WLANs," in *IEEE/ACM Transactions on Networking (TON)*, 2018.

[6] **Y. Ghasempour**, M.K. Haider, C. Cordeiro, D. Koutsonikolas, E. Knightly, "Multi-Stream Beam-Training for mmWave MIMO Networks," in *Proceedings of ACM MobiCom*, 2018 *(acceptance rate: 22%)*.

[7] M.K. Haider, **Y. Ghasempour**, D. Koutsonikolas, E. Knightly, "LiSteer: mmWave Beam Acquisition and Steering by Tracking Indicator LEDs on Wireless APs," in *Proceedings of ACM MobiCom*, 2018 *(acceptance rate: 22%)*.

[8] M.K. Haider, **Y. Ghasempour**, E. Knightly,"SearchLight: Tracking Device Mobility using Indoor Luminaries to Adapt 60 GHz Beams," in *Proceedings of ACM MobiHoc*, 2018 *(acceptance rate: 16.8%)*.

[9] **Y. Ghasempour**, C. Cordeiro, C. DaSilva, E. Knightly, "IEEE 802.11ay: Next-Generation 60 GHz Communication for 100 Gb/s Wi-Fi," in *IEEE Communications Magazine*, 2017.

[10] **Y. Ghasempour**, E. Knightly,"Decoupling Beam Steering and User Selection for Scaling Multi-User 60 GHz WLANs," in *Proceedings of ACM MobiHoc*, 2017 *(acceptance rate: 17%)*.

[11] S.K. Saha*, **Y. Ghasempour***, M.K. Haider*, T. Siddiqui, P. De Melo, N. Somanchi, L. Zakrajsek, A. Singh, O. Torres, D. Uvaydov, J.M. Jornet ,"X60: A Programmable Testbed for Wideband 60 GHz WLANs with Phased Arrays," in *Proceedings of ACM WiNTECH*, 2017. ***Second Place, Best Paper Award.*** $*$ *Primary co-authors*

[12] **Y. Ghasempour**, N. Prasad, M. Khojastepour, S. Rangarajan,"Managing Analog Beams in mmWave Networks," in *Proceedings of Asilomar Conference on Signals, Systems and Computers*, 2017.

[13] **Y. Ghasempour**, N. Prasad, M. Khojastepour, S. Rangarajan,"Link Packing in mmWave Networks," in *Proceedings of IEEE ICC*, 2017.

[14] **Y. Ghasempour**, N. Prasad, M. Khojastepour, S. Rangarajan,"Novel Combinational Results on Downlink MU-MIMO Scheduling with Applications," in *Proceedings of IEEE WONS*, 2017.

[15] **Y. Ghasempour**, "Scaling 60 GHz WLANs: Creating and Identifying opportunities for Multi-User Transmission," Master's Thesis, 2016.

PATENTS

- "Link Packing in mmWave Networks", US Patent App. 15/678,681.
- "Managing Analog Beams in mmWave Networks", US Patent App. 15/676,517.

HONORS & AWARDS

- Selected as **EECS Rising Star** 2019
- Second Place Winner of the **Best Ph.D. Presenter Award** at Rice ECE 2019
- Recipient of CRA-W Fellowship 2019
- Recipient of N2Women **Young Researcher Fellowship** 2018
- Recognized as **Star Doctoral Student**, ECE Department, Rice University 2018
- Recipient of ACM SIGMOBILE Travel Grant 2016, 2017, 2018
- Finalist for **Best Paper Award** at ACM WiNTECH 2017
- Recipient of Society of Iranian-American Women for Education Fellowship 2015 and 2017
- Recipient of **Texas Instruments Distinguished Fellowship** 2014
- Recipient of Rice Electrical and Computer Engineering Fellowship 2014
- Ranked 7th among 320,000 participants of Iranian Nationwide Annual University Entrance Exam 2010
- Dean's Honorary Award by President of Sharif University of Technology 2010

INVITED TALKS

[1] ECE Seminar, University of Washington, March 2019
"Scaling Wireless Communications in Date Rate and User Density"

[2] NSF RCN Workshop, New York City, NY., July 2018
"Multi-Stream Beam Training for mmWave MIMO Systems"

[3] Millimeter Networks (mmNets) Workshop, Snowbird, UT., October 2017
"Multi-User 60 GHz WLANs: from Standards to User Selection Policies"

[4] ECE Affiliates Conference, Rice University, March 2018
"mmWave Beam Acquisition and Steering with Practical Phased Array Antennas"

[5] Keck Seminar, Brown University, October 2016
"Spatial Multiplexing in Millimeter-Wave Networks"

[6] Keck Seminar, Rice University, November 2015
"Maximizing Spatial Streams in THz band"

[7] ECE Affiliates Conference, Rice University, March 2015
"Next Generation Millimeter-Wave Wireless Communications: Achieving Multi-Gigabit Data Rates"

PROFESSIONAL ACTIVITIES

- Organizer of the Girls in Science Day Houston, 2019
  (to encourage 6^{th}-12^{th} grades girls to pursue higher education in the STEM fields)
- Organizer of the N2 Women event Los Angeles, 2018
  (a networking event for women in ACM community)
- Co-Chair of the ACM S^3 Workshop NYC, 2016
  (S^3 stands for Wireless of the Students, by the Students, and for the Students)
- Mentoring ECE students at Rice University as part of Women's Leadership Group Since 2014
- **Reviewer for:**
  - IEEE Transactions on Communications
  - IEEE Transactions on Wireless Communications
  - IEEE Transactions on Mobile Computing
  - IEEE Transactions on Vehicular Technology
  - IEEE Wireless Communication Letters
  - Proceedings of IEEE
  - Elsevier Computer Networks
  - IEEE WCNC
  - IEEE WONS
  - IEEE DySPAN
  - IEEE SECON
  - ACM Millimeter-Wave Networked System (mmSys)

TEACHING EXPERIENCE

- High Performance Computer Architecture — Spring 2018
- Intro to Communication Networks — Fall 2016 and Fall 2017
- Electronic Measurement Systems — Spring 2016 and Spring 2017
- Intro to Random Processes — Fall 2015
- Communication Systems — Fall 2013
- Computer and Microprocessor Architecture — Fall 2013
- Electronic Principles — Fall 2013
- Analog Circuits — Spring 2013
- Logic Circuits — Spring 2013

SKILLS

Specialized Software:	NS3, Simulink, LabVIEW, OPNET, ModelSim, Code Vision AVR
Programming Languages:	Python, C++, C, Java, MATLAB, Assembly, HTML, LaTeX
Hardware:	WARP platform, Verilog, PCB design, DSP

REFERENCES

Prof. Edward Knightly
Sheafor-Lindsay Professor
Electrical and Computer Engineering
Rice University
knightly@rice.edu

Prof. Ashutosh Sabharwal
Professor and Department Chair
Electrical and Computer Engineering
Rice University
ashu@rice.edu

Dr. Carlos Cordeiro
Senior Principal Engineer and Senior Director
Intel Corporation
carlos.cordeiro@intel.com

Prof. Daniel Mittleman
Professor
Electrical Engineering
Brown University
daniel_mittleman@brown.edu