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## Nicholas Mastronarde

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### Office Address

University at Buffalo  
Department of Electrical Engineering  
226 Davis Hall  
Buffalo, NY 14260

### RESEARCH INTERESTS

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- **AI/ML for Wireless Networks:** Reinforcement learning (RL) for energy harvesting wireless sensors, Internet of Things (IoT), 5G scheduling, and digital twin.
- **NextG Wireless Networks:** Active-passive coexistence, software-defined networking, mmWave networks, device-to-device (D2D) relays, unmanned aerial vehicle (UAV) networks and applications, citizens broadband radio service (CBRS).
- **Modeling, Simulation, and Field Experimentation for Future Networks:** UB-ANC (unmanned aerial vehicle networking simulation/emulation), RF-SITL (software-defined transceiver and channel emulation), NeXT (digital twin-enabled multi-fidelity network simulator), UnionLabs (cloud-based platform for testbed sharing).

### EMPLOYMENT HISTORY

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- 8/2017 - Present University at Buffalo, The State University of New York, Buffalo, NY  
Associate Professor, Department of Electrical Engineering
- 8/2011 - 8/2017 University at Buffalo, The State University of New York, Buffalo, NY  
Assistant Professor, Department of Electrical Engineering

### EDUCATION

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- 2006-2011: University of California, Los Angeles (UCLA)  
Ph.D. Electrical Engineering  
**Dissertation:** Online learning for energy-efficient multimedia systems  
**Advisor:** Prof. Mihaela van der Schaar
- 2005-06: University of California, Davis (UC Davis)  
M.S. Electrical Engineering  
**Thesis:** Video streaming over wireless multi-hop mesh networks  
**Advisor:** Prof. Mihaela van der Schaar
- 2001-05: University of California, Davis (UC Davis)  
B.S. Electrical Engineering

### HONORS, AWARDS, AND FELLOWSHIPS

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- UB's Teaching Innovation Award 2022
- IEEE Connecting the Unconnected Challenge, Technical Proof of Concept 2<sup>nd</sup> Place 2021
- SEAS Senior Teacher of the Year 2020

- Dimitris N. Chorafas Foundation Award 2011
- UCLA Graduate Division Dissertation Year Fellowship 2010-2011
- IBM Research Watson Lab Graduate Intern Fellowship 2010
- Intel Corporation Graduate Intern Fellowship 2007
- UCLA EE First Year Department Fellowship 2006-2007
- UC Davis ECE Department Fellowship 2005-2006
- UC Davis ECE B.S. with Highest Honors and Department Citation 2005

### ACHIEVEMENTS POST-TENURE

<b>Research expenditures</b>	<ul style="list-style-type: none"> <li>• \$876,822</li> </ul>
<b>Journal articles</b>	<ul style="list-style-type: none"> <li>• 13 published</li> <li>• 4 in review</li> </ul>
<b>Conference papers</b>	<ul style="list-style-type: none"> <li>• 26 published</li> </ul>
<b>Student mentorship</b>	<ul style="list-style-type: none"> <li>• 3 PhD students graduated</li> <li>• 3 PhD students in progress (1 co-advised)</li> <li>• 4 MS thesis students graduated</li> <li>• 2 MS thesis students in progress</li> <li>• 16 undergraduate research students mentored</li> </ul>

### SPONSORED RESEARCH

**Total: \$5,244,698; Total as PI: \$1,184,288; My share: \$1,900,389.**

### EXTRAMURAL SUPPORT

- [1] “Development of RFSoc-based Mesh Networked UAV Swarm,” US Air Force Research Laboratory, Oct. 2023 – Sept. 2026, total **\$900,000** (my role: co-PI; my share: **\$450,000**; PI: Zhangyu Guan; part of a collaborative project with Florida Atlantic University (FAU)).
- [2] “SUNY OpenIoT Lab: The SUNY laboratory federation for wireless intelligent internet of things,” SUNY Innovative Instructional Technology Grant (ITTG), July 2023 – June 2024, total **\$60,000** (my role: co-PI; my share: **\$30,000**; PI: Zhangyu Guan).
- [3] “Modeling, simulation, and emulation of InfoNets with the UB-ANC Emulator,” US Air Force Research Laboratory, Oct. 2022 – Jan. 2023, total **\$200,000** (my role: **PI**; my share: **\$130,000**; co-PI: Zhangyu Guan; part of a collaborative project with FAU). To be continued in FY 2024 with additional funding.
- [4] “ZTSwarm: Toolchain development for digital twin-assisted zero touch swarm control,” US Air Force Research Laboratory, Jan. 2023 – Dec. 2024, total **\$1,200,000** (my role: co-PI; my share: **\$200,000**; PI: Zhangyu Guan, co-PI: Karthik Dantu; part of a collaborative project with FAU).
- [5] “DEEPMission: Digital twin-Enabled nEtworKing and Planning for mission-driven autonomous UAV systems,” US Air Force Research Laboratory, March 2022 – Feb. 2023, total **\$285,000** (my role: co-PI; my share: **\$94,050**; PI: Zhangyu Guan, co-PI: Karthik Dantu).
- [6] “New RFID Production Technologies,” ARMOR-IIMAK, July 2021 – Dec. 2022, total **\$79,658** (my role: co-PI; my share: **\$26,287**; PI: Zhangyu Guan, co-PI: Filippo Malandra).
- [7] “OVERCOME21: CBRS Deployment in the Fruit Belt Neighborhood in Buffalo, NY,” US Ignite/Schmidt Futures, April 2021 – March 2022, total **\$300,000** (my role: co-PI; my share: **\$6226**; PI: Filippo Malandra, co-PIs: Zhangyu Guan and Sunha Kim).

- [8] “Advanced UAS swarm network simulation with SwarmControl, the UB-ANC Emulator, and AFSIM,” US Air Force Research Laboratory, Dec. 18, 2020 – Sept. 30, 2021, total **\$241,752** (my role: **PI**; my share: **\$60,438**; co-PI: Zhangyu Guan; total includes sub-award to GE Aviation).
- [9] “Collaborative Research: SWIFT: LARGE: AI-Enabled Spectrum Coexistence between Active Communications and Passive Radio Services: Fundamentals, Testbed and Data,” National Science Foundation, Award No. ECCS 2030157, Oct. 1, 2020 – Sept. 30, 2024, total **\$900,000** (my role: **PI at UB**; my share: **\$198,000**; lead institution: Mississippi State University; collaborating institution: Clemson University).
- [10] “Autonomous interference avoiding networking on the Mxxx GE platform,” GE Aviation, Sept. 1, 2018 – Sept. 30, 2020, total **\$170,000** (my role: **PI at UB**; my share: **\$56,100**; lead institution: Florida Atlantic University; UB received funding as subaward through lead institution).
- [11] “Integration of EMANE and the UB-ANC Emulator,” US Air Force Research Laboratory, Mar. 1, 2019 – Dec. 31, 2020, total **\$50,000** (my role: **PI**; my share: **\$25,000**; co-PI: Karthik Dantu).
- [12] “CCSS: Collaborative Research: Ubiquitous sensing for VR/AR immersive communication: A machine learning perspective,” National Science Foundation, Award No. ECCS 1711335, July 1, 2017 – June 30, 2020, total **\$370,000** (my role: **PI at UB**; my share: **\$148,000**; lead institution: University of Alabama).
- [13] “Autonomous aerial swarms for continuous real-time intelligence, surveillance, and reconnaissance,” US Air Force Research Laboratory. Amendment to existing grant, total **\$60,000** (my role: **PI**; my share: **100%**).
- [14] “Scheduling mission-critical flows in congested and contested airborne network environments,” US Air Force Research Laboratory, Feb. 4, 2014 – Sept. 30, 2017, total **\$257,157** (my role: **PI**; my share: **100%**).
- [15] “Tactical environment emulation in UB’s Airborne Networking and Communications Testbed (UB-ANC),” Griffis Institute, Sept. 4, 2015 – Oct. 31, 2015, total **\$5000** (my role: **PI**; my share: **100%**).
- [16] “Scheduling heterogeneous flows in a bottleneck airborne network node,” Griffis Institute, Aug. 1, 2013 – Oct. 31, 2013, total **\$23,973** (my role: **PI**; my share: **100%**).
- [17] “Scheduling heterogeneous flows in a bottleneck airborne network node,” Rome Research Corporation, Aug. 5, 2013 – Nov. 4, 2013, total **\$18,000** (my role: **PI**; my share: **100%**).  
Equipment grant for purchasing 6 USRP N210 software-defined radios, 6 SBX USRP Daughterboards (400 MHz–4.4 GHz), 12 VERT2450 Antennas, and 5 Dell Latitude E6530 laptops.
- [18] Air Force Research Laboratory Research Fellowship, total **\$56,471** (my role: **PI**; my share: **100%**; Summer 2018, Summer 2016, Summer 2015, Summer 2013).

#### UNIVERSITY AT BUFFALO SUPPORT

- [1] “Advancing field testing of structures,” UBVPR Buffalo Blue Sky, June 2022 – May 2023. **\$10,000** (my role: co-PI; my share: **\$5,000**; PI: Pinar Okumus, co-PI: Zhangyu Guan).
- [2] “Multi-drone sensor system for search and rescue,” UBVPR Buffalo Blue Sky, Feb. 8, 2019 – Aug. 31, 2020. **\$10,000** (my role: **PI**; my share: **\$4,000**; co-PIs: Jun Hwan Choi and Jee Eun Kang).
- [3] SUNY Open Educational Resources (OER) Services, **\$1,687** (my share: **100%**).
- [4] STEM Mentoring for Undergraduate Research Initiative (SMURI), Spring 2014, **\$1,000** (my share: **100%**).
- [5] Startup: **\$45,000** (my share: **100%**).

## PUBLICATIONS

**Summary:** 28 peer-reviewed journal papers published; 4 peer-reviewed journal papers in review; 61 peer-reviewed conference papers published.

**Citations total:** 1587 citations (1033 since 2018); h-index 22; i10-index 37 (retrieved from Google Scholar on 10/21/2023).

**Research supervision:** Dr. Mastronarde’s supervised graduate students are underlined in the references below. Supervised undergraduate students are underlined and italicized.

### PEER-REVIEWED JOURNAL PAPERS (post-tenure)

- [1] F. Ghanei, J. Modares, **N. Mastronarde**, and K. Dantu, “Minimum energy coverage path planning for UAVs,” *in review*.
- [2] M. Koosha and **N. Mastronarde**, “Coexistence of Satellite-borne Passive Radiometry and Active Terrestrial Wireless Networks in the Restricted 1400-1427 MHz Passive Band,” *in review*.
- [3] S. K. Moorthy, Z. Guan, **N. Mastronarde**, E. S. Bentley, and M. Medley, “Hiding specification complexity for zero-touch software-defined wireless networks,” *in review*.
- [4] N. Accurso, **N. Mastronarde**, and F. Malandra, “A comprehensive MDP-based approach to model and optimize discontinuous reception (DRX) in cellular IoT networks,” *in review*.
- [5] S. K. Moorthy, **N. Mastronarde**, E. S. Bentley, M. Medley, and Z. Guan, “OSWireless: Hiding specification complexity for zero-touch software-defined wireless networks,” *Computer Networks*, to appear.
- [6] J. Hu, Z. Zhao, M. McManus, S. K. Moorthy, Y. Cui, **N. Mastronarde**, E. S. Bentley, M. Medley, Z. Guan, “NeXT: Architecture, prototyping and measurement of a software-defined testing framework for integrated RF network simulation, experimentation, and optimization,” *Computer Communications*, vol. 210, pp. 342-355, Oct. 2023.
- [7] M. McManus, Z. Guan, Y. Cui, Z. Zhang, **N. Mastronarde**, J. Hu, S. K. Moorthy, E. S. Bentley, and M. Medley, “Digital twin-enabled domain adaptation for zero-touch UAV networks: survey and challenges,” *Computer Networks*, vol. 236, Nov. 2023.
- [8] S. K. Moorthy, **N. Mastronarde**, S. Pudlewski, and E. S. Bentley, and Z. Guan, “Swarm UAV Networking with Collaborative Beamforming and Automated ESN Learning in the Presence of Unknown Blockages,” *Computer Networks*, vol. 231, July 2023.
- [9] J. Hu, S. K. Moorthy, A. Harindranath, Z. Zhang, Z. Zhao, **N. Mastronarde**, E. S. Bentley, S. Pudlewski, and Z. Guan, “A mobility-resilient spectrum sharing framework for operating wireless UAV in the 6 GHz band,” *IEEE/ACM Trans. on Networking*, pp. 1 – 15, May 2023.
- [10] J. Sun, N. Sharma, J. Chakareski, **N. Mastronarde**, Y. Lao, “Hardware acceleration for post-decision state reinforcement learning in IoT systems,” *IEEE Internet of Things Journal*, vol. 9, no. 12, pp. 9889 – 9903, June 2022.
- [11] **N. Mastronarde**, N. Sharma, J. Chakareski, “Improving data-driven reinforcement learning in wireless IoT systems using domain knowledge,” *IEEE Communications Magazine*, vol. 59, no. 11, Nov. 2021.
- [12] Z. Hajibabaei, A. Vosoughi, and **N. Mastronarde**, “Optimal power allocation for M-ary distributed detection in the presence of channel uncertainty,” *Signal Processing*, vol. 169, April 2020.
- [13] N. Sharma, **N. Mastronarde**, and J. Chakareski, “Accelerated structure-aware reinforcement learning for delay-sensitive energy harvesting wireless sensors,” *IEEE Trans. on Signal Processing*, vol. 68, pp. 1409-1424, Feb. 2020.

- [14] N. Sharma, **N. Mastronarde**, and J. Chakareski, “Delay-sensitive energy harvesting wireless sensors: optimal scheduling, structural properties, and approximation analysis,” *IEEE Trans. on Communications*, vol. 68, no. 4, pp. 2509-2524, Nov. 2019.
- [15] J. Modares, **N. Mastronarde**, and K. Dantu, “Simulating unmanned aerial vehicle swarms with the UB-ANC Emulator,” *International Journal of Micro Air Vehicles*, April 2019.
- [16] J. Chakareski, S. Naqvi, **N. Mastronarde**, J. Xu, F. Afghah, and A. Razi, “An energy efficient framework for UAV-assisted millimeter wave 5G heterogeneous cellular networks,” *IEEE Trans. on Green Communications and Networking*, vol. 3, no. 1, pp. 37-44, March 2019.
- [17] S. Wu, R. Atat, **N. Mastronarde**, and L. Liu, “Improving the coverage and spectral efficiency of millimeter-wave cellular networks using device-to-device relays,” *IEEE Trans. On Communications*, vol. 66, no. 5, pp. 2251-2265, May 2018. **Selected to be featured in IEEE COMSOC MMTC Communications R-Letter, ed. C. Chen, Nov. 2018.**

#### PEER-REVIEWED JOURNAL PAPERS (M.S., doctoral, and tenure-track work)

- [1] R. Atat, L. Liu, **N. Mastronarde**, and Y. Yi, “Energy harvesting-based relay-assisted D2D cellular networks,” *IEEE Trans. on Communications*, vol. 65, no. 3, pp. 1289-1302, March 2017.
- [2] **N. Mastronarde**, V. Patel, J. Xu, L. Liu, and M. van der Schaar, “To relay or not to relay: learning device-to-device relaying strategies in cellular networks,” *IEEE Trans. on Mobile Computing*, vol. 15, no. 6, pp. 1569-1585, June 2016.
- [3] K. Kanoun, D. Atienza, **N. Mastronarde**, and M. van der Schaar. “Online energy-efficient task-graph scheduling for multicore platforms,” *IEEE Trans. on Computer-Aided Design of Integrated Circuits and Systems*, vol. 33, no. 8, pp. 1194-1207, Aug. 2014.
- [4] **N. Mastronarde** and M. van der Schaar, “Joint physical-layer and system-level power management for delay-sensitive wireless communication,” *IEEE Trans. on Mobile Computing*, vol. 12, no. 4, pp. 694-709, April 2013.
- [5] **N. Mastronarde**, K. Kanoun, D. Atienza, P. Frossard, and M. van der Schaar, “Markov decision process based energy-efficient on-line scheduling for slice-parallel video decoders on multicore systems,” *IEEE Trans. on Multimedia*, vol. 15, no. 2, pp. 268-278, Feb. 2013.
- [6] **N. Mastronarde**, F. Verde, D. Darsena, A. Scaglione, and M. van der Schaar, “Transmitting important bits and sailing high radio waves: a decentralized cross-layer approach to cooperative video transmission,” *IEEE J. on Select. Areas in Communications Cooperative Networking – Challenges and Applications*, vol. 30, no. 9, pp. 1597-1604, Oct. 2012.
- [7] **N. Mastronarde** and M. van der Schaar, “Fast reinforcement learning for energy-efficient wireless communication,” *IEEE Trans. on Signal Processing*, vol. 59, no. 12, pp. 6262-6266, Dec. 2011.
- [8] **N. Mastronarde** and M. van der Schaar, “Online reinforcement learning for dynamic multimedia systems,” *IEEE Trans. on Image Processing*, vol. 19, no. 2, pp. 290-305, Feb. 2010.
- [9] **N. Mastronarde** and M. van der Schaar, “Designing autonomous layered video coders,” *Elsevier Journal Signal Processing: Image Communication – Special Issue on Scalable Coded Media Beyond Compression*, vol. 24, no. 6, pp. 417-436, July 2009.
- [10] **N. Mastronarde** and M. van der Schaar, “Towards a general framework for cross-layer decision making in multimedia systems,” *IEEE Trans. on Circuits and Systems for Video Technology*, vol. 19, no. 5, pp. 719-732, May 2009.
- [11] **N. Mastronarde** and M. van der Schaar, “Automated bidding for media services at the edge of a content delivery network,” *IEEE Trans. on Multimedia*, vol. 11, no. 3, pp. 543-555, Apr. 2009.
- [12] **N. Mastronarde** and M. van der Schaar, “A bargaining theoretic approach to quality-fair system resource allocation for multiple decoding tasks,” *IEEE Trans. Circuits and Systems for Video Technology*, vol. 18, no. 4, pp. 453-466, Mar. 2008.

- [13] **N. Mastronarde** and M. van der Schaar, "A queuing-theoretic approach to task scheduling and processor selection for video decoding applications," *IEEE Trans. Multimedia*, vol. 8, no. 7, pp. 1493-1507, Nov. 2007.
- [14] **N. Mastronarde**, D. S. Turaga, and M. van der Schaar. "Collaborative resource exchanges for peer-to-peer video streaming over wireless mesh networks," *IEEE J. on Select. Areas in Communications Peer-to-peer Communications and Applications*, vol. 25, no. 1, pp. 108-118, Jan. 2007.
- [15] Y. Andreopoulos, **N. Mastronarde**, and M. van der Schaar, "Cross-layer optimized video streaming over wireless multi-hop mesh networks," *IEEE J. on Select. Areas in Communications Multi-Hop Wireless Mesh Networks*, vol. 24, no. 11, pp. 2104-2115, Nov. 2006.

#### PEER-REVIEWED CONFERENCE PROCEEDINGS (post-tenure)

- [1] A. Omer, F. Malandra, J. Chakareski, **N. Mastronarde**, "Performance evaluation of 5G delay-sensitive single-carrier multi-user downlink scheduling," *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 2023.
- [2] M. Seguin, A. Omer, M. Koosha, F. Malandra, and **N. Mastronarde**, "Deep reinforcement learning for downlink scheduling in 5G and Beyond Networks: a review," *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 2023.
- [3] M. Koosha and **N. Mastronarde**, "Minimizing estimation error variance using a weighted sum of samples from the soil moisture active passive (SMAP) satellite," *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, July 2023.
- [4] N. Mishra, Y. V. Iyengar, A. C. Raikar, N. Thomas, S. K. Moorthy, J. Hu, Z. Zhao, **N. Mastronarde**, E. S. Bentley, and M. Medley, "Demo Abstract: Scaling Out srsRAN Through Interfacing Wirelessly srsENB With srsEPC," *IEEE International Conference on Computer Communications (INFOCOM)*, May 2023.
- [5] N. Accurso, F. Malandra, and **N. Mastronarde**, "Modelling and optimization of DRX in cellular IoT networks: an MDP approach," *IEEE International Conference on Communications (ICC)*, May 2023.
- [6] M. Koosha and **N. Mastronarde**, "Opportunistic temporal spectrum coexistence of passive radiometry and active wireless networks," *IEEE Western New York Image and Signal Processing Workshop*, Nov. 2022.
- [7] J. Hu, M. McManus, S. K. Moorthy, Y. Cui, Z. Guan, **N. Mastronarde**, E. S. Bentley, and M. Medley, "NeXT: A software-defined testbed with integrated optimization, simulation and experiment," *IEEE Future Networks World Forum*, Oct. 2022. **Best Paper Award First Runner Up.**
- [8] S. K. Moorthy, Z. Guan, **N. Mastronarde**, E. S. Bentley, and M. Medley, "OSWireless: Enhancing automation for optimizing intent-driven software-defined wireless networks," *IEEE International Conference on Mobile Ad Hoc and Smart Systems (MASS)*, Oct. 2022. (Acceptance rate: 29%)
- [9] S. K. Moorthy, A. Harindranath, M. McManus, Z. Guan, **N. Mastronarde**, E. S. Bentley, and M. Medley, "A middleware for digital twin-enabled flying network simulations using UBSim and UB-ANC," *IEEE DCOSS Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE)*, June 2022.
- [10] **N. Mastronarde**, D. Russell, Z. Guan, G. Sklivanitis, D. Pados, E. S. Bentley, and M. Medley, "RF-SITL: A software-in-the-loop channel emulator for swarm networks," *4<sup>th</sup> IEEE WoWMoM Workshop on Wireless Networking, Planning, and Computing for UAV Swarms (SwarmNet)*, June 2022.

- [11] M. McManus, Z. Guan, **N. Mastronarde**, and E. S. Bentley, “Enabling digital twin-based wireless networking through deep reinforcement learning with domain adaptation,” in *Proc. Of SPIE Conference Big Data IV: Learning, Analytics, and Applications*, April 2022.
- [12] S. K. Moorthy, C. Lu, Z. Guan, **N. Mastronarde**, G. Sklivantis, D. Pados, E. S. Bentley, and M. Medley, “CloudRAFT: A cloud-based framework for remote experimentation for wireless research,” *IEEE International Workshop on Communication and Networking for Swarms Robotics (IEEE RoboCom 2022)*, Jan. 2022.
- [13] N. Accurso, **N. Mastronarde**, and F. Malandra, “Exploring tradeoffs between energy consumption and network performance in cellular-IoT: a Survey,” *IEEE Global Communications Conference (GLOBECOM)*, pp. 1-6, Dec. 2021. (Acceptance rate: 39.6%)
- [14] J. Hu, S. K. Moorthy, A. Harindranath, Z. Guan, **N. Mastronarde**, E. S. Bentley, S. Pudlewski, “SwarmShare: Mobility-resilient spectrum sharing for swarm UAV networking in the 6 Ghz Band,” *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, July 2021. (Acceptance rate: 26.4%)
- [15] J. Dai, **N. Mastronarde**, Jee Eun Kang, and Karthik Dantu, “Multi-UAV energy-efficient coverage path planning using dynamic programming and set partitioning,” *STRATUS Conference*, May 2021.
- [16] J. Chakareski and **N. Mastronarde**, “Mobile-edge cooperative multi-user 360-degree video computing and streaming,” *IEEE International Workshop on Multimedia Signal Processing (MMSP)*, Sept. 2020.
- [17] N. Sharma, S. Zheng, S. Venkata, F. Malandra, **N. Mastronarde**, J. Chakareski, “Deep reinforcement learning for delay-sensitive LTE downlink scheduling,” *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, Aug. 2020.
- [18] J. Sun, N. Sharma, J. Chakareski, **N. Mastronarde**, Y. Lao, “Action evaluation hardware accelerator for next-generation real-time reinforcement learning in emerging IoT systems,” *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, July 2020.
- [19] M. Rantanen, **N. Mastronarde**, J. Hudack, and K. Dantu, “Decentralized task allocation in lossy networks: a simulation study,” *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, June 2019. (Acceptance rate: 28.6%)
- [20] C. Lee, **N. Mastronarde**, M. van der Schaar, “Estimation of individual treatment effect in latent confounder models via adversarial learning,” *Neural Information Processing Systems Workshops – Machine Learning for Health*, Dec. 2018. **Among 6% of papers invited for spotlight talk.**
- [21] O. Lahav, **N. Mastronarde**, M. van der Schaar, “What is interpretable? Using machine learning to design interpretable decision-support systems,” *Neural Information Processing Systems Workshops – Machine Learning for Health*, Dec. 2018. **Among 6% of papers invited for spotlight talk.**
- [22] M. Rantanen, J. Modares, **N. Mastronarde**, F. Ghanei, and K. Dantu, “Performance of the asynchronous consensus based bundle algorithm in lossy network environments,” *IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)*, July 2018.
- [23] N. Sharma, **N. Mastronarde**, and J. Chakareski, “Structural properties of optimal transmission policies for delay-sensitive energy harvesting wireless sensors,” *IEEE International Conference on Communications (ICC)*, May 2018. (Acceptance rate: 40%)
- [24] S. Wu and **N. Mastronarde**, “Coverage and spectral efficiency of device-to-device relay-assisted cellular networks,” *IEEE International Conference on Communications (ICC)*, May 2018. (Acceptance rate: 40%)
- [25] S. Naqvi, J. Chakareski, **N. Mastronarde**, J. Xie, F. Afghah, and A. Razi, “Energy efficiency analysis of UAV-assisted mmWave HetNets,” *IEEE International Conference on Communications (ICC)*, May 2018. (Acceptance rate: 40%)

- [26] S. Wu, P. Johari, **N. Mastronarde**, and J. M. Jornet, “On the photo-thermal effect of intra-body nano-optical communications on red blood cells,” *IEEE INFOCOM Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE)*, pp. 645-650, April 2018.

**PEER-REVIEWED CONFERENCE PROCEEDINGS (M.S., doctoral, and tenure-track work)**

- [1] J. Modares, **N. Mastronarde**, and K. Dantu, “Realistic network simulation in the UB-ANC aerial vehicle network emulator,” *IEEE INFOCOM Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE)*, pp. 1-6, May 2017.
- [2] J. Modares, F. Ghanei, **N. Mastronarde**, and K. Dantu, “UB-ANC Planner: Minimum energy coverage path planning with multiple drones,” *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1-8, May 2017. (Acceptance rate: 41%)
- [3] A. H. Memar, **N. Mastronarde**, and E. T. Esfahani, “Design of a novel variable stiffness gripper using permanent magnets,” *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1-6, May 2017. (Acceptance rate: 41%)
- [4] S. Wu, R. Atat, **N. Mastronarde**, and L. Liu, “Coverage analysis of D2D relay-assisted millimeter-wave cellular networks,” *IEEE Wireless Communications and Networking Conference*, pp. 1-6, Mar. 2017.
- [5] J. Modares, **N. Mastronarde**, K. Dantu, “UB-ANC Emulator: An emulation framework for multi-agent drone networks,” *IEEE International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN)*, pp. 252-258, Dec. 2016.
- [6] **N. Mastronarde**, J. Modares, C. Wu, and J. Chakareski, “Reinforcement learning for energy-efficient delay-sensitive CSMA/CA scheduling,” *IEEE Global Communications Conference (GLOBECOM)*, pp. 1-7, Dec. 2016.
- [7] H. Chen, L. Liu, **N. Mastronarde**, L. Ma, and Y. Yi, “Cooperative retransmission for massive MTC under spatiotemporal correlated interference,” *IEEE Global Communications Conference (GLOBECOM)*, pp. 1-6, Dec. 2016.
- [8] J. Modares and **N. Mastronarde**, “Poster: UB-ANC: A flexible airborne networking and communications testbed,” *ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH)*, pp. 95-96, Oct. 2016.
- [9] J. Modares, **N. Mastronarde**, and K. Dantu, “Demo: UB-ANC Emulator: An emulation framework for multi-agent drone networks,” *ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH)*, pp. 93-94, Oct. 2016.
- [10] P. Shome, J. Modares, **N. Mastronarde**, and A. Sprintson, “Enabling dynamic reconfigurability of SDRs using SDN principles,” *Ad Hoc Networks*, pp. 369-381, Sept. 2016.
- [11] N. Toorchi, J. Chakareski, and **N. Mastronarde**, “Fast and low-complexity reinforcement learning for delay-sensitive energy harvesting wireless visual sensing systems,” *IEEE International Conference on Image Processing (ICIP)*, pp. 1804-1808, Sept. 2016. (Acceptance rate: 45%)
- [12] P. Shome, M. Yan, J. Modares, **N. Mastronarde**, and A. Sprintson, “CrossFlow: A cross-layer architecture for SDR using SDN principles,” *IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, pp. 37-39, Nov. 2015.
- [13] C. Wu, **N. Mastronarde**, and M. Gerla, “Incentive driven LTE content distribution in VANETs,” *The 14<sup>th</sup> IFIP Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net)*, pp. 1-8, June 2015. (Acceptance rate: 54.5%)
- [14] **N. Mastronarde**, V. Patel, and L. Liu, “Device-to-device relay assisted cellular networks with token-based incentives,” *IEEE International Conference on Communications (ICC)*, pp. 698-704, June 2015. (Acceptance rate: 38.6%)



- [15] V. Patel, **N. Mastronarde**, M. J. Medley, and J. D. Matyjas, "Towards optimal priority and deadline driven scheduling in dynamic wireless environments," *IEEE International Symposium on a World of Wireless and Mobile Multimedia Networks (WoWMoM)*, pp. 1-10, June 2015. (Acceptance rate: 21%)
- [16] C. Ababei and **N. Mastronarde**, "Benefits and costs of prediction based DVFS for NoCs at Router Level," *IEEE International System-on-Chip Conference (SOCC)*, pp. 255-260, Sept. 2014.
- [17] K. Kanoun, D. Atienza, **N. Mastronarde**, and M. van der Schaar, "A unified online directed acyclic graph flow manager for multicore schedulers," *19th Asia and South Pacific Design Automation Conference (ASP-DAC 2014)*, pp. 714-719, Jan. 2014. (Acceptance rate: 31.5%)
- [18] **N. Mastronarde**, V. Patel, J. Xu, and M. van der Schaar, "Learning relaying strategies in cellular D2D networks with token-based incentives," *International Workshop on Emerging Technologies for LTE-Advanced and Beyond-4G, IEEE Global Communications Conference (GLOBECOM)*, pp. 163-169, Dec. 2013. (Acceptance rate: 41%)
- [19] **N. Mastronarde**, K. Kanoun, D. Atienza, and M. van der Schaar, "Markov decision process based energy-efficient scheduling for slice-parallel video decoding," *1<sup>st</sup> IEEE Workshop of GREEN Multimedia: Energy-efficient Multimedia Computing, Communication and Presentation (In conjunction with ICME 2013)*, pp. 1-6, July 15-19, 2013.
- [20] O. Habachi, **N. Mastronarde**, H.-P. Shiang, M. van der Schaar, Y. Hayel, "A learning based congestion control for multimedia transmission in wireless networks," *IEEE International Conference on Multimedia & Expo (ICME)*, pp. 1-6, July 15-19, 2013. (Acceptance rate: 30%)
- [21] **N. Mastronarde** and M. van der Schaar, "Energy-efficient delay-critical communication in unknown wireless environments," *IEEE COMSOC MMTC E-Letter*, vol. 7, no. 8, pp. 8-11, Nov. 2012.
- [22] E. Jung, D. Gupta, **N. Mastronarde**, and X. Liu, "Network-congestion-aware video streaming: a rest-and-download approach," *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, pp. 668-676, June 2012. (Acceptance rate: 31%)
- [23] **N. Mastronarde**, F. Verde, D. Darsena, A. Scaglione, and M. van der Schaar, "A decentralized cross-layer approach to cooperative video transmission," *IEEE Global Communications Conference (GLOBECOM)*, pp. 1-6, Dec. 5-9, 2011. (Acceptance rate: 36.6%)
- [24] **N. Mastronarde** and M. van der Schaar, "Reinforcement learning for power management in wireless multimedia communications," *IEEE International Conference on Multimedia & Expo (ICME)*, pp. 1-6, July 11-15, 2011. **Designated "Top 15%" paper; Best paper candidate; Selected to be featured in IEEE COMSOC MMTC R-Letter, ed. C. J. Debono, Dec. 2011.** (Acceptance rate: 30%)
- [25] **N. Mastronarde** and M. van der Schaar, "Reinforcement learning for energy-efficient wireless transmission," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 3452-3455, May 22-27, 2011. (Acceptance rate: 49%)
- [26] N. Changuel, **N. Mastronarde**, M. van der Schaar, B. Sayadi, and M. Kieffer, "Adaptive scalable layer filtering process for video scheduling over wireless networks based on MAC buffer management," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 2352-2355, May 22-27, 2011. (Acceptance rate: 49%)
- [27] N. Changuel, **N. Mastronarde**, M. van der Schaar, B. Sayadi, and M. Kieffer, "End-to-end stochastic scheduling of scalable video over time varying channels," *Proc. ACM Multimedia*, pp. 731-734, Oct. 25-29, 2010. (Acceptance rate: 32%)
- [28] **N. Mastronarde**, M. van der Schaar, A. Scaglione, F. Verde, and D. Darsena, "Sailing good radio waves and transmitting important bits: relay cooperation in wireless video transmission," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 5566-5569, Mar. 14-19, 2010. (Acceptance rate: 48.8%)

- [29] **N. Mastronarde** and M. van der Schaar, “A new approach to cross-layer optimization of multimedia systems,” *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 2310-2313, Mar. 14-19, 2010. (Acceptance rate: 48.8%)
- [30] **N. Mastronarde** and M. van der Schaar, “Online reinforcement learning for multimedia buffer control,” *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 1958-1961, Mar. 14-19, 2010. (Acceptance rate: 48.8%)
- [31] **N. Mastronarde** and M. van der Schaar, “Online layered learning for cross-layer optimization of dynamic multimedia systems,” *ACM Multimedia Systems*, pp. 47-58, Feb. 22-23, 2010. (Acceptance rate: 42%)
- [32] **N. Mastronarde** and M. van der Schaar, “Autonomous decision making in layered and reconfigurable video coders,” *Asilomar Conference on Signals, Systems, and Computers*, pp. 553-557, Nov. 1-4, 2009.
- [33] **N. Mastronarde** and M. van der Schaar, “A scalable complexity specification for video applications,” *IEEE International Conference on Image Processing (ICIP)*, pp. 2576-2579, Oct. 12-15, 2008. (Acceptance rate: 45%)
- [34] **N. Mastronarde**, D. S. Turaga, and M. van der Schaar, “Collaborative resource management for video over wireless multi-hop mesh networks,” *IEEE International Conference on Image Processing (ICIP)*, pp. 1297-1300, Oct. 8-11, 2006. (Acceptance rate: 40.8%)
- [35] **N. Mastronarde**, Y. Andreopoulos, M. van der Schaar, D. Krishnaswamy and J. Vicente, “Cross-layer video streaming over 802.11e-enabled wireless mesh networks,” *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, vol. 5, pp. V-433- V-436, May 14-19, 2006. (Acceptance rate: 48.1%)

#### BOOK CHAPTER

- [1] Y. Andreopoulos, **N. Mastronarde**, and M. van der Schaar, “Cross-layer Optimized Video Streaming over Wireless Multi-hop Mesh Networks,” Cambridge University Press 2007, ed. Benny Bing (Georgia Tech).

#### TECHNICAL REPORTS

- [1] N. Sharma, **N. Mastronarde**, J. Chakareski, “Accelerated structure-aware reinforcement learning for delay-sensitive energy harvesting wireless sensors,” arXiv:1807.08315
- [2] J. Modares, **N. Mastronarde**, M. J. Medley, and J. D. Matyjas, “UB-ANC: An open platform testbed for software-defined airborne networking and communications,” arXiv:1509.08346.
- [3] **N. Mastronarde**, V. Patel, J. Xu, and M. van der Schaar, “To relay or not to relay: learning relaying strategies in cellular device-to-device networks,” arXiv:1308.3185.
- [4] **N. Mastronarde**, K. Kanoun, D. Atienza, P. Frossard, and M. van der Schaar, “Markov decision process based energy-efficient on-line scheduling for slice-parallel video decoders on multicore systems,” arXiv:1112.4084.
- [5] **N. Mastronarde**, F. Verde, D. Darsena, A. Scaglione, and M. van der Schaar, “Transmitting important bits and sailing high radio waves: a decentralized cross-layer approach to cooperative video transmission,” arXiv:1102.5437.
- [6] **N. Mastronarde** and M. van der Schaar, “Fast Reinforcement Learning for Energy Efficient Wireless Communications,” arXiv:1009.5773.

#### PATENTS

- [1] Alina Beygelzimer, **N. Mastronarde**, Srinivasan Parthasarathy, Anton V. Riabov, Deepak Turaga, and Octavian Udrea, “Automated Data Exploration,” U.S. Patent 20140040279, Feb. 2014.

- [2] N. Mastronarde and H. Jiang, “Enabling Selective Use of Fractional and Bidirectional Video Motion Estimation,” U.S. Patent 20090323807, Dec. 2009.

## SCHOLARLY PRESENTATIONS

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### INVITED TALKS (Conference presentations not included)

- [1] *Improving data-driven reinforcement learning in wireless IoT systems using system models*, UCLA Electrical Engineering Reinforcement Learning Course (virtual), April 27, 2021.
- [2] *Accelerating reinforcement learning in emerging wireless IoT systems and applications via system awareness*, Stanford ISL Colloquium (virtual), Jan. 14, 2021.
- [3] *Accelerated structure-aware reinforcement learning for delay-sensitive energy harvesting wireless sensors*, UCLA Electrical Engineering Reinforcement Learning Course (virtual), May 21, 2020.
- [4] *Simulating swarm networks with the UB-ANC Emulator*, FAU Autonomous Networking Exchange, Boca Raton, FL, Dec. 11-12, 2019.
- [5] *Simulating swarm networks with the UB-ANC Emulator*, 1st Buffalo Day for 5G and Wireless Internet of Things, University at Buffalo, Nov. 22, 2019.
- [6] *Demo: Simulating swarms of unmanned aircraft systems with the UB-ANC Emulator*, Swarm Demo Day, Air Force Research Laboratory, Rome, NY, Sept. 2019.
- [7] *Simulating swarms of small unmanned aircraft systems with the UB-ANC Emulator and EMANE*, Invited Talk, Air Force Research Laboratory, Rome, NY, July 2019.
- [8] *An open-source framework for evaluating UAS mission effectiveness in extreme environments*, Air Force Visiting Faculty Fellowship Program Out-Briefing, Air Force Research Laboratory, Rome, NY, August 2018.
- [9] *University at Buffalo’s Airborne Networking and Communications (UB-ANC) Ecosystem*, GE Aviation, Advanced and Special Projects, Grand Rapids, NY, July 13, 2018.
- [10] *Designing multi-agent drone networks and applications with the University at Buffalo’s Airborne Networking and Communications Testbed*, SUNY Polytechnic Visiting Scholar Seminar Series, Utica, NY, March 2018.
- [11] *University at Buffalo’s Airborne Networking and Communications (UB-ANC) Ecosystem*, Modeling, Simulation and Emulation Technical Interchange Meeting, Air Force Research Laboratory, Rome, NY, August 2017.
- [12] *Designing multi-agent drone networks and applications with the University at Buffalo’s airborne networking and communications testbed*, Complex Networks Seminar, University at Buffalo, May 4, 2017.
- [13] *Undergraduate research and training with the University at Buffalo’s airborne networking and communications testbed*, EE Advisory Board Meeting, University at Buffalo, April 27, 2017.
- [14] *Distributed command and control in drone networks: from simulation to experimentation*, Technical Interchange Meeting with the Air Force Research Laboratory, University at Buffalo, April 14, 2017.
- [15] *UB-ANC: A flexible airborne networking and communications testbed*, AFRL/MathWorks Interchange Meeting, Air Force Research Laboratory, Rome, NY, July 14, 2016.
- [16] *UB-ANC: A flexible airborne networking and communications Testbed*, Technical Interchange Meeting, Air Force Research Laboratory, Rome, NY, July 13, 2016.
- [17] *UB-ANC Emulator: A cyber-physical emulation framework for UAV networking*, Information Institute Networking Interchange and Poster Session, Air Force Research Laboratory, Rome, NY, July 12, 2016.

- [18] *UB-ANC: An emulation framework for multi-agent UAV networks*, AFCEA 2016 C4I & Cyber Conference, Erie Canal Chapter, Poster Session, June 14, 2016.
- [19] *Enabling dynamic reconfigurability of SDRs Using SDN Principles*, AFCEA 2016 C4I & Cyber Conference, Erie Canal Chapter, Software Defined Networking for Airborne Networks Workshop, June 14, 2016.
- [20] *UB-ANC: A software-defined airborne networking and communications research platform*, Air Force Summer Faculty Fellowship Program (AF SFFP) Exit Talk, Air Force Research Laboratory, Rome, NY, Aug. 7, 2015.
- [21] *UB-ANC: A software-defined airborne networking and communications research platform*, Cognitive RF Workshop 2015 Poster Session, Air Force Research Laboratory, Rome, NY, Aug. 6, 2015.
- [22] *Towards optimal priority and deadline driven scheduling in dynamic wireless environments*, Information Institute Networking Interchange and Poster Session, Air Force Research Laboratory, Rome, NY, July 14, 2015.
- [23] *Congestion-aware HTTP adaptive streaming in mobile broadband cellular networks*, Adaptive Media Transport Workshop, Cisco Systems, Paris, May 18-19, 2015.
- [24] *Scheduling mission-critical flows in congested and contested airborne network environments*, Technical Interchange Meeting, Air Force Research Laboratory, Rome, NY, July 17, 2014.
- [25] *Introduction to game theory with applications to resource allocation*, Invited Speaker, USTC, Hefei China, Oct. 30, 2013.
- [26] *UB Multimedia Communications and Systems Lab: Some present and past research*, Invited Speaker, USTC, Hefei China, Oct. 28, 2013.
- [27] *Joint physical-layer and system-level power management for delay-sensitive wireless communication*, Invited Speaker, IEEE SPS Rochester Chapter, Aug. 8, 2013.
- [28] *Scheduling heterogeneous flows over a bottleneck airborne network node*, Exit Seminar, Air Force Summer Faculty Fellowship Program (AF SFFP) Air Force Research Lab, Rome, NY, Aug. 1, 2013.
- [29] *Energy-efficient communications using Markov decision processes and reinforcement learning*, Invited Speaker, SUNY Buffalo Electrical Engineering Graduate Seminar, Nov. 4, 2011.
- [30] *Reinforcement learning for power management in wireless multimedia communications*, Invited Speaker, Visual and Image Processing (VIP) Seminar, University of Waterloo, Sept. 30, 2011.

## CONFERENCE PRESENTATIONS

- [1] *Deep reinforcement learning for downlink scheduling in 5G and Beyond Networks: a review*, IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Toronto, Ontario, Canada, Sept. 2023.
- [2] *AI-enabled spectrum coexistence between active communications and passive radio services: Fundamentals, testbed and data*, Spectrum Week 2023, National Science Foundation, Alexandria, Virginia, April 2023.
- [3] *Mobile-edge cooperative multi-user 360-degree video computing and streaming*, IEEE International Workshop on Multimedia Signal Processing (MMSP), Virtually in Tampere, Finland, Sept. 2020.
- [4] *Decentralized task allocation in lossy networks: a simulation study*, IEEE International Conference on Sensing, Communication, and Networking (SECON), Boston, MA, June 2019.
- [5] *Estimation of individual treatment effect in latent confounder models via adversarial learning*, Neural Information Processing Systems Workshops – Machine Learning for Health, Montreal, Quebec, Dec. 2018.

- [6] *What is interpretable? Using machine learning to design interpretable decision-support systems*, Neural Information Processing Systems Workshops – Machine Learning for Health, Montreal, Quebec, Dec. 2018.
- [7] *Performance of the asynchronous consensus based bundle algorithm in lossy network environments*, IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), Sheffield, UK, July 2018.
- [8] *Structural properties of optimal transmission policies for delay-sensitive energy harvesting wireless sensors*, IEEE International Conference on Communications (ICC), Kansas City, MO, May 2018.
- [9] *On the photo-thermal effect of intra-body nano-optical communications on red blood cells*, 2nd IEEE International Workshop on Wireless Communications and Networking in Extreme Environments (INFOCOM Workshops), Waikiki, HI, April 2018. (**Best presentation award.**)
- [10] *UB-ANC Planner: Energy efficient coverage path planning with multiple drones*, IEEE International Conference on Robotics and Automation (ICRA), Singapore, June 2017.
- [11] *Design of a novel variable stiffness gripper using permanent magnets*, IEEE International Conference on Robotics and Automation (ICRA), Singapore, May 2017.
- [12] *Realistic network simulation in the UB-ANC aerial vehicle network emulator*, 1<sup>st</sup> IEEE Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE), Atlanta, GA, May 2017.
- [13] *Reinforcement learning for energy-efficient delay-sensitive CSMA/CA scheduling*, IEEE Global Communications Conference (GLOBECOM), Washington, DC, Dec. 2016.
- [14] *Poster: UB-ANC: A flexible airborne networking and communications testbed*, ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH), New York City, NY, Oct. 2016.
- [15] *Demo: UB-ANC Emulator: An emulation framework for multi-agent drone networks*, ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH), New York City, NY, Oct. 2016.
- [16] *Enabling dynamic reconfigurability of SDRs using SDN principles*, ADHOCNETS, Ottawa, Canada, Sept. 2016.
- [17] *Fast and low-complexity reinforcement learning for delay-sensitive energy harvesting wireless visual sensing systems*, IEEE International Conference on Image Processing (ICIP), Phoenix, Arizona, Sept. 2016.
- [18] *Towards optimal priority and deadline driven scheduling in dynamic wireless environments*, IEEE International Symposium on a World of Wireless and Mobile Multimedia Networks (WoWMoM), Boston, MA, June 2015.
- [19] *Device-to-device relay assisted cellular networks with token-based incentives*, IEEE International Conference on Communications (ICC), June 2015.
- [20] *Learning relaying strategies in cellular D2D networks with token-based incentives*, International Workshop on Emerging Technologies for LTE-Advanced and Beyond-4G, IEEE Global Communications Conference (GLOBECOM), Dec. 2013.
- [21] *Markov decision process based energy-efficient scheduling for slice-parallel video decoding*, 1<sup>st</sup> IEEE Workshop of GREEN Multimedia: Energy-efficient Multimedia Computing, Communication and Presentation (In conjunction with ICME 2013), July 2013.
- [22] *A decentralized cross-layer approach to cooperative video transmission*, IEEE Global Communications Conference (GLOBECOM), Dec. 2011.
- [23] *Reinforcement learning for power management in wireless multimedia communications*, IEEE Conference on Multimedia and Expo (ICME), July 2011.

- [24] *A new approach to cross-layer optimization of multimedia systems*, IEEE Conference on Acoustics, Speech and Signal Processing (ICASSP), Mar. 2010.
- [25] *Online reinforcement learning for multimedia buffer control*, IEEE Conference on Acoustics, Speech and Signal Processing (ICASSP), Mar. 2010.
- [26] *Online layered learning for cross-layer optimization of dynamic multimedia systems*, ACM Multimedia Systems, Feb. 2010.
- [27] *Autonomous decision making in layered and reconfigurable video coders*, Asilomar Conference on Signals, Systems, and Computers, Nov. 2009.
- [28] *A scalable complexity specification for video applications*, IEEE International Conference on Image Processing (ICIP), Oct. 2008.

## **COURSES TAUGHT, DEVELOPED, AND REVISED**

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### **EAS 240: Introduction to Programming for Engineers**

- *Developed*: Spring 2017. Created all new course material.
- **Teaching innovation:**
  - I leverage a digital textbook (zyBooks) with an auto grader (zyLabs) so students can get immediate feedback on their coding assignments and correct any errors before their deadlines.
  - I use course discussion boards, such as Piazza or Campuswire, to stay in close contact with students and facilitate nearly 300 rapid responses to their technical questions per semester.
  - My lectures combine traditional power point presentations with in-class coding exercises to illustrate key concepts.
- *Taught*: Spring 2017, Spring 2019-2023
- *Average enrollment*: 70
- *Average instructor evaluation*: 4.3

### **EE 305: Applied Probability**

- *Revised*: Fall 2013. To differentiate from EAS 305 and better serve EE students, I introduced EE specific problems and examples, increased emphasis on random processes, and introduced MATLAB projects to illustrate key concepts.
- **Teaching innovation:**
  - I adapted Open Educational Resources (OERs) from MIT OpenCourseWare to develop comprehensive yet accessible lecture materials for UB EE students.
  - I developed high-quality, well-organized, and concise lecture recordings using Panopto after transitioning to remote instruction. I now provide these as a supplement to my in-person instruction.
  - I assign a final MATLAB project where students create random music using Markov chains, which brings abstract concepts in probability to life.
  - My lectures combine traditional presentations with in-class exercises, which the students can work on individually or with their neighbors before we discuss the solution as a class. This triggers many “aha!” moments among students.
- *Taught*: Fall of 2013-2022
- *Average enrollment*: 107
- *Average instructor evaluation*: 4.6

**EAS 305: Applied Probability and Statistical Inference**

- *Developed:* Spring 2012. Created all new course material. Class open to all engineering students.
- *Taught:* Spring of 2012 and 2013
- *Average enrollment:* 85
- *Average instructor evaluations:* 3.71

**EE 565: Video Communications**

- *Developed:* Fall 2011. Created new course material. Developed course to emphasize resource allocation and scheduling, cross-layer design, and dynamic optimization for video communications.
- *Taught:* Fall of 2011 and 2012, Spring of 2014-2016 and 2019-2021
- *Average enrollment:* 25
- *Average instructor evaluations:* 4.7

**EE 498: Undergraduate Research and Creative Activity**

- See Undergraduate Student Research Projects under Research Supervision (below) for details. EE 498 projects are marked in bold.
- ***Teaching innovation:***
  - I develop undergraduate research projects that are closely aligned with the research in my lab (whether students are enrolled in EE 498 or not).
  - I mentor teams of undergraduates who work on different facets of a larger project and interact closely with me, my graduate students, and collaborators. This provides students with a richer experience and more perspectives than if they work in isolation or with only one mentor.

**RESEARCH SUPERVISION**

**Summary:** 4 Ph.D. students graduated; 3 Ph.D. students in progress (1 co-advised); 9 M.S. students graduated; 2 M.S. students in progress; 35 undergraduate research students mentored.

**Ph.D. Students (in progress)**

- Zhaoxi Zhang, expected graduation in Spring 2026 (co-advised with Zhangyu Guan)
- Mohammad Koosha, expected graduation in Spring 2025
- Anjali Omer, expected graduation in Spring 2024

**Ph.D. Students (graduated)**

- Nikhilesh Sharma, Summer 2020
  - *Dissertation title:* Value function approximation algorithms for reinforcement learning in delay-sensitive wireless communications
  - *Awards:* Moog Scholarship
  - *Employment:* Research Scientist, Amazon
- Zahra Hajibabaei, Spring 2019
  - *Dissertation title:* Reduction in energy consumption in wireless sensor networks and IEEE 802.11 DCF
  - *Awards:* Henry Stone Fellowship
  - *Employment:* System Engineer at Qualcomm, Inc.

- Shuanshuan Wu, Spring 2018
  - *Dissertation title:* Stochastic geometry-based analysis of emerging network technologies: from mmWave cellular to nano-optical wireless networks
  - *Awards:* Dean's Fellowship
  - *Employment:* System Engineer at Qualcomm, Inc.
- Jalil Modares Najafabadi, Spring 2017
  - *Dissertation title:* Designing multi-drone networks and applications
  - *Awards:* Best graduate student GPA and best score on Ph.D. qualifying exam
  - *Employment:* Software Engineer at Qualcomm, Inc.

### M.S. Students (in progress)

- David Bone, expected graduation in Fall 2023
  - *Project:* Design of the 2nd Generation of the University at Buffalo's Airborne Networking and Communications Emulator (UB-ANC G2)
  - *Employment:* Air Force Research Laboratory, Rome, NY
- Andrew Corra, expected graduation in Spring 2024 (part-time student)
  - *Project:* Sample-based post-decision state reinforcement learning
  - *Employment:* Moog, Inc.

### M.S. Students with Thesis (graduated)

- Mingkun Shi, Spring 2020
  - *Thesis title:* Implementation of a Connectivity Service for UAV Swarms with a Distributed Algorithm
  - *Employment:* 5G Test Engineer, Spirent Communications
- Someshwar Rao Somayajula Venkata, Spring 2019
  - *Thesis title:* Delay-optimal MAC level LTE scheduling using deep reinforcement learning for downlink
  - *Note:* Jointly advised with Filippo Malandra in EE
  - *Employment:* Modem System Test Engineer, Qualcomm Inc.
- Venkata Praneeth Behara, graduation date, Fall 2018
  - *Thesis title:* Wi-Coverage: An autonomous exploration coverage strategy using commodity Wi-Fi
  - *Employment:* Robotics Software Engineer, Discovery Robotics
  - *Note:* Jointly advised with Prof. Karthik Dantu in CSE
- Nikhilesh Sharma, graduation date, Fall 2017
  - *Thesis title:* Structural properties of optimal transmission policies for delay-sensitive energy-harvesting wireless sensors
- Anjali Omer, graduation date, Spring 2017
  - *Thesis title:* Performance analysis of an adaptive-rate buffer-aware CSMA/CA-based MAC protocol
- Rajarshi Basak, graduation date, Fall 2016
  - *Thesis title:* On the convergence rate of fast reinforcement learning algorithms with application to energy-efficient delay-sensitive wireless communications
  - *Employment:* Senior software engineer



- Changcan Wu, graduation date, Summer 2014
  - *Project title:* Energy-efficient delay-sensitive multi-user uplink scheduling using a CSMA/CA-based MAC
- Sweta Sundaram, graduation date, Spring 2014
  - *Thesis title:* Matroska video streaming on USRP software-defined radios
  - *Employment:* Senior Modem System Test Engineer (5G NR), Qualcomm Inc.
- Praveen Janarthanan, graduation date, Spring 2013
  - *Thesis title:* Cross-layer framework for wireless video over USRP
  - *Employment:* RF and Firmware Engineer, Apple Inc.

### M.S. Students (graduated)

- Viral Patel, graduation date, Spring 2015
  - *Employment:* Team Lead, ESG
  - *Note:* Originally admitted as a Ph.D. student in Fall 2012 but had to seek a terminal M.S. degree and secure a job due to family obligations.
- Khoi Nguyen, graduation date, Spring 2014
  - *Employment:* Automation Engineer, Hyatt Hotels Corporation
  - *Note:* Originally admitted as a Ph.D. student in Fall 2012 but had to seek a terminal M.S. degree and secure a job due to family obligations.

### Undergraduate Student Research Projects<sup>1</sup>

- Jamel Usen, EE, Summer 2022 – Spring 2023 [CSTEP]
  - *Project:* Analysis of passive remote sensing radio frequency interference
- Andrew Corra, EE, Fall 2020 – Spring 2022
  - *Project:* Markov decision process based optimization and reinforcement learning for energy-efficient delay-sensitive transmission scheduling
  - *Employment:* Moog, Inc.
  - *Post-grad:* M.S., Electrical Engineering, University at Buffalo (in progress)
- Michael Tilkins, EE, Fall 2020 – Spring 2022
  - *Project:* 4G/5G network SINR modeling in Python, leveraging ns3-gym and ns3-ai for AI-based 4G/5G downlink scheduling in ns-3
  - *Employment:* Moog, Inc.
- Daniel Walsh, EE, Fall 2020
  - *Project:* 4G/5G network downlink scheduling simulation in ns-3
- Elan Anderson, EE, Fall 2020 [EE 498 – Fa20]
  - *Project:* 4G/5G network downlink scheduling simulation in Python
  - *Employment:* Associate Engineer, National Grid
- Shreya Puranik, EE, Fall 2019 [EE 498 – Fa19]
  - *Project:* LoPy board setup and testing
  - *Post-grad:* M.S., Electrical and Computer Engineering, Purdue University

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<sup>1</sup> **Glossary:** Collegiate Science and Technology Entry Program ([CSTEP](#)); Success Through Access to Guidance and Experience ([SAGE](#)); Louis Stokes Alliance for Minority Participation ([LSAMP](#)); EE 494 Senior Capstone Design Project; EE 498 Undergraduate Research and Creative Activity.

- Salvatore Piazza, EE, Summer 2019 – Fall 2019 [**EE 498 – Fa19**]
  - *Project:* Deep Q network implementation and testing
  - *Employment:* FPGA Engineer, L3Harris
- Anna Sholk, EE, Summer 2018 – Spring 2019 [**EE 494 – Sp19; EE 498 – Fa18**]
  - *Project:* Enforcing airspace regulations via cloud-enabled UAV air traffic control
- Andrew Fulkerson, EE, Summer 2018 – Spring 2019 [**EE 494 – Sp19; EE 498 – Fa18**]
  - *Project:* Enforcing airspace regulations via cloud-enabled UAV air traffic control
  - *Employment:* Software Engineer, Northrop Grumman
- Nicholas McCartney, EE, Spring 2018 – Summer 2019
  - *Projects:* Drone swarming simulation in the UB-ANC Emulator, cloud-enabled UAV air traffic control
  - *Employment:* SRC Inc.
- Ibrahima Barry, EE, Fall 2017 – Spring 2018 [**SAGE**]
  - *Project:* Wi-Fi localization using SparkFun ESP8266 Thing
- Nasiah Johnson, EE, Summer 2017 – Spring 2019 [**EE 494 – Sp19; EE 498 – Fa18, CSTEP Su18, LSAMP Su17**]
  - *Projects:* LPWAN-based GPS beacon for cloud-enabled UAV air traffic control, Wi-Fi localization using SparkFun ESP8266 Thing, Slotted ALOHA simulation with multiple receivers
- James Leu, EE, Summer 2017 – Spring 2019 [**EE 494 – Sp19**]
  - *Projects:* LPWAN-based GPS beacon for cloud-enabled UAV air traffic control, UAV flight testing for multi-agent task allocation and energy profiling
  - *Employment:* Component Engineer, Lockheed Martin
- Simeng Gao, EE, Summer 2017 – Spring 2018
  - *Project:* UAV flight testing for multi-agent task allocation
  - *Post-grad:* M.S., Electrical Computer Engineering Technology, Georgia Institute of Technology
  - *Employment:* Software Development Engineer, Amazon
- Joseph David Caputo, EE, Summer 2017 – Fall 2018
  - *Projects:* Sensing with an Intel RealSense stereo/infrared vision camera, UAV flight testing for multi-agent task allocation and energy profiling
  - *Employment:* FGPA & ASIC Engineer, Lockheed Martin
- Matthew Rantanen, EE, Spring 2017 – Summer 2018
  - *Project:* Decentralized task allocation in lossy networks
  - *Post-grad:* Ph.D. student, Dept. of Mathematics, University at Buffalo
- Sambhavi Bellary, EE, Fall 2016
  - *Project:* A Literature Review on the Application of Markov Decision Processes in Electrical Engineering
  - *Employment:* Electrical Engineer, Buro Happold
- Wei Shao, EE, Summer 2016 – Fall 2016 [**EE 498 – Fa16**]
  - *Project:* RC Transmitter Calibration, Specification, and Troubleshooting Guidelines for 2nd Generation UB-ANC Drones
  - *Employment:* System Engineer, Lockheed Martin

- Alvin Alba, EE, Summer 2016 [**EE 498 – Su16**]
  - *Project:* Enhancing the Power Distribution System, Flight Stability, and Modularity of 2nd Generation UB-ANC Drones
  - *Employment:* Electronics Engineer, Tinker Air Force Base
- Jean Santiuste, EE, Summer 2016
  - *Project:* Enhancing the Power Distribution System, Flight Stability, and Modularity of 2nd Generation UB-ANC Drones
  - *Employment:* Electronics Engineer, Bolling Air Force Base
- Alexander Rosenbaum, EE, Summer 2016
  - *Project:* Implementation of 2nd Generation UB-ANC Drone Enhancements
- Ismail Atkas, EE, Fall 2015 – Spring 2016 [**EE 498 – Fa15**]
  - *Project:* Drone Collision Detection and Autonomous Navigation
  - *Employment:* Systems Engineer, Alstom
- Andrew Tennenbaum, EE, Spring 2015 [**EE 494 – Sp15**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: USB Interface Implementation
  - *Postgrad:* M.S. Electrical Engineering, University at Buffalo; Ph.D. Student, Aerospace Engineering, University at Buffalo
- Nathan Jacobson, EE, Spring 2015 [**EE 494 – Sp15**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: MAC Layer Protocol Design
  - *Employment:* Radar Signal Processing Engineer, Raytheon
  - *Postgrad:* M.S. Student, The Johns Hopkins University
- Vu Le, EE, Spring 2015 [**EE 494 – Sp15**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: Network Protocol Design
  - *Postgrad:* M.S. and Ph.D., Electrical Engineering, University at Buffalo
- Prince Joseph, MAE, Fall 2014 – Summer 2015
  - *Project:* Design, Construction, and Testing of the 2nd Generation UB-ANC Drone
  - *Employment:* Mechanical Design Engineer, Xerox 3D Metal Printing
- Ryan Thorne, EE, Fall 2014 – Spring 2015 [**EE 494 – Sp15; EE 498 – Fa14**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: Software-Defined Physical Layer Implementation
  - *Postgrad:* Law Student, Patent Law, Yeshiva University
  - *Employment:* Desmarais LLP
- Matthew Benjamin, EE, Fall 2014 – Spring 2015 [**EE 494 – Sp15; EE 498 – Fa14**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: Packet Format Design
  - *Employment:* Software Engineer, theEMPLOYEEapp
- Conor Hixon, EE, Fall 2014 – Spring 2015
  - *Project:* Construction and Testing of the 1st Generation UB-ANC Drone
  - *Employment:* Integration & Test Engineer, L3Harris

- Jordan Hoeber, CSE, Fall 2014
  - *Project:* Enabling Communication Between An Embedded Computer and an Autopilot Controller via USB
  - *Employment:* ACV Auctions
- Rakshit Viswanatham, EE, Fall 2014 [**EE 498 – Fa14**]
  - *Project:* Flight Test Plan for UB’s Airborne Networking and Communications Testbed (UB-ANC): Autopilot Failsafes
  - *Employment:* Software Engineer, Oracle
- Zujia Xu, EE, Fall 2014 [**CSTEP**]
  - *Project:* Flight Test Plan for UB’s Airborne Networking and Communications Testbed (UB-ANC): Test Platform Description
- Xiangyang Chen, EE, Summer 2014 – Fall 2014 [**CSTEP**]
  - *Project:* Evaluating the Distortion Impact of Packet Losses in Streaming Video
  - *Employment:* Electronics Engineer, Department of Army
- Dylan Elliott, EE, Spring 2014 – Spring 2015 [**EE 494 – Sp15; EE 498 – Fa14**]
  - *Project:* Quadcopter Based Airborne Networking and Communications Testbed: Software-Defined Physical Layer Implementation
  - *Employment:* Data Analyst, Machine Learning, Inari
  - *Postgrad:* M.S. Student, Rensselaer Polytechnic Institute
- Devin Toth, CSE, Spring 2012
  - *Project:* Shortest-Path Routing using a Markov Decision Process

#### **PH.D. DISSERTATION COMMITTEE MEMBER**

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1. Yue Wang, Towards data efficiency and robustness of reinforcement learning. *Defense:* July 20, 2023. *Ph.D. advisor:* Shaofeng Zou
2. Sabarish Krishna Moorthy, Enhancing the automation for resource orchestration in software-defined broadband flying networks. *Defense:* April 17, 2023. *Ph.D. advisor:* Zhangyu Guan
3. Hongyu Li, Accelerating MRI with deep learning: from anatomic to quantitative imaging. *Defense:* Dec. 2, 2022. *Ph.D. advisor:* Leslie Ying
4. Kaushik Gajula, Series arc fault detection on DC microgrids and predictive sensitivity for control of DC systems. *Defense:* April, 18, 2022. *Ph.D. advisor:* Luis Herrera
5. Vu Le, Series arc fault identification on DC distribution based on ensemble machine learning. *Defense:* Feb. 9, 2022. *Ph.D. advisor:* Xiu Yao
6. Chaoyi Zhang, Acceleration of quantitative magnetic resonance imaging using compressed sensing method. *Defense:* Dec. 12, 2021. *Ph.D. advisor:* Leslie Ying
7. Debaditya Chaudhuri, Characterization of rate regions in secure network coding over general Wiretab Networks. *Defense:* Aug. 2, 2021. *Ph.D. advisor:* Michael Langberg
8. Inhwon Lee, Active voltage balancing control of series connected SiC MOSFET submodules in high power application. *Defense:* July 27, 2021. *Ph.D. advisor:* Xiu Yao
9. Haochen Hu, Sensing using wireless networks in extreme environments. *Defense:* July 17, 2021. *Ph.D. advisor:* Zhi Sun
10. Zhangyu Li, Reconfigurable metamaterial-enhanced communication, sensing, and wireless power transfer in extreme environments. *Defense:* June 21, 2021. *Ph.D. advisor:* Zhi Sun
11. Gaurav Nagesh Shetty, Unsupervised Regression Imputation of Data on Manifolds via Bi-linear Modeling. *Defense:* Dec. 18, 2020. *Ph.D. advisor:* Kostas Slavakis

12. Uttam Kumar, Multipliers based on Carry Arrest Multi-Operand Addition. *Defense*: Nov. 12, 2020. *Ph.D. advisor*: Adly Fam.
13. Fei Wei, A Structural Study of Network Coding Through the Lens of Group Theory. *Defense*: Aug. 14, 2020. *Ph.D. advisor*: Michael Langberg.
14. Honey Pandey, Propagation Modeling and Modulation Design for Intra-body Wireless Communication. *Defense*: Aug. 13, 2020. *Ph.D. advisor*: Josep Jornet.
15. Sarankumar Balakrishnan, Physical Layer Security in Millimeter Wave Systems: From Multi-Gigabit WLAN to Autonomous Vehicles. *Defense*: June 30, 2020. *Ph.D. advisor*: Zhi Sun
16. Alex Byrley, Logarithmic Frequency Waveforms, *Defense*: Dec. 3, 2019. *Ph.D. advisor*: Adly Fam
17. Qing Xia, Ultra-Broadband Protocol Stack Design for Directional Terahertz Communication Networks. *Defense*: Aug. 28, 2018. *Ph.D. advisor*: Josep Jornet.
18. Zahed Hossain, Physical and Link Layer Design for Ultra-Broadband Terahertz Communications. *Defense*: Aug. 6, 2018. *Ph.D. advisor*: Josep Jornet.
19. Kaiying Sun, Outage Performance Analysis and Downlink Beamforming Designs for Multi-User Massive MIMO Wireless Communication Systems, *Defense*: Aug. 3, 2018. *Ph.D. advisor*: Weifeng Su.
20. Ngwe Thawdar, Terahertz Band Communications: System Architecture and Physical Layer Solutions. *Defense*: May 15, 2018. *Ph.D. advisor*: Dimitris Pados.
21. Ukash Nakarmi, Kernel and Manifold Models for Highly Accelerated Dynamic Magnetic Resonance Imaging. *Defense*: May 8, 2018. *Ph.D. advisor*: Leslie Ying.
22. Song-Wen Huang, Multicarrier Chirp-Division Multiplexing for RF and Underwater Acoustic Communications: *Defense*: Dec. 15, 2017. *Ph.D. advisor*: Dimitris Pados.
23. Pedram Johari, Fundamentals of Nanoscale Intra-body Electromagnetic Communications at Terahertz and Optimal Frequencies. *Defense*: Dec. 14, 2017. *Ph.D. advisor*: Josep Jornet.
24. Colleen Bailey, New Techniques for Blind Modulation Detection and Multimedia Data Hiding. *Defense*: Aug. 6, 2017. *Ph.D. advisor*: Dimitris Pados
25. Christopher Fritz, Efficient Architectures for High Speed Binary Multipliers. *Defense*: May 5, 2017. *Ph.D. advisor*: Adly Fam.
26. Hongzhi Guo, Enabling Wireless Communications in Complex Environments: From Underground and Underwater to Intra-body. *Defense*: Apr. 24, 2017. *Ph.D. advisor*: Zhi Sun.
27. Marcia Torrico, Joint Channel Estimation and Data Detection with Minimized Energy and Secure Transmission on the Underwater Channel. *Defense*: Dec. 9, 2016. *Ph.D. advisor*: Dimitris Pados.
28. Bo Zhang, Optimal Receivers and Performance Analysis for Underwater Acoustic Wireless Communications with Rapidly Varying Fading Channels. *Defense*: Aug. 8, 2016. *Ph.D. advisor*: Weifeng Su.
29. Yihang Zhou, Application of Compressed Sensing in Quantitative Magnetic Resonance Imaging. *Defense*: Dec. 11, 2015. *Ph.D. advisor*: Leslie Ying.
30. Zijian Mo, Multi-Antenna Transceivers and Cooperative Relaying Protocol Designs for Wireless Networks. *Defense*: March 20, 2015. *Ph.D. advisor*: Weifeng Su.
31. Peiran Song, Distributed Optimization of Nonconvex Multiagent Systems: Theory and Applications. *Defense*: Dec. 15, 2014. *Ph.D. advisor*: Gesualdo Scutari.
32. Scott Pudlewski, Compressed-sensing-based video streaming in wireless sensor networks. *Defense*: April 20, 2012. *Ph.D. advisor*: Tommaso Melodia.

**M.S. THESIS COMMITTEE MEMBER**

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1. Vaishali Maheshkar, Improved detection of recyclable plastics using multi modal sensing and machine learning. *Defense*: Dec. 23, 2022. *M.S. advisor*: Karthik Dantu
2. Zhaoxi Zhang, SLAM based airborne visual mapping system. *Defense*: Dec. 15, 2022. *M.S. advisor*: Zhangyu Guan.
3. Ishita Dhopeswar, Antenna and reader design and measurement technique for conductive thermal transfer printing based RFID production. *Defense*: Dec. 15, 2022. *M.S. advisor*: Zhangyu Guan.
4. Zhiyuan Zhao, Software defined flying wireless networks. *Defense*: Dec. 15, 2022. *M.S. advisor*: Zhangyu Guan.
5. Yuqing Cui, Communication Efficient Networked Multi-Agent RL. *Defense*: Dec. 15, 2022. *M.S. advisor*: Zhangyu Guan.
6. Girish Kumar, Singular perturbation and predictive sensitivity based control of DC microgrids. *Defense*: Dec. 17, 2021. *M.S. advisor*: Luis Herrera
7. Maitreyee Mohan Joshi, Analyzing LTE performance for interference detection. *Defense*: July 26, 2021. *M.S. advisor*: Filippo Malandra
8. Nicholas Accurso, Optimization of the discontinuous reception (DRX) energy-delay tradeoff. *Defense*: July 22, 2021. *M.S. advisor*: Filippo Malandra
9. Ranjith Samuel Suresh Kumar, Software-defined Experimentation Platform for Wireless Drone Networks. *Defense*: Dec. 11, 2020. *M.S. advisor*: Zhangyu Guan
10. Nataraj Botta, Optimum Receiver Design for Internet-of-Things (IoT) with LORA Transmission Signals. *Defense*: June 9, 2020. *M.S. advisor*: Weifeng Su
11. Ahona Bhattacharyya, A study on multi-output multi-kernel recursive least squares against outliers. *Defense*: May 12, 2020. *M.S. advisor*: Kostas Slavakis
12. Ashwini Aher, Multi-kernel Recursive Least Squares in the Presence of Sparse Outliers. *Defense date*: August 8, 2019. *M.S. advisor*: Kostas Slavakis
13. Soham Desai, Enabling Underwater Acoustic Cooperative MIMO Systems by Metamaterial-Enhanced Magnetic Induction Technique. *Defense date*: August 6, 2019. *M.S. advisor*: Zhi Sun
14. Shreyas Manjuladevi, Enhanced Spatial Smoothing and Coprime Array for Direction of Arrival Estimation. *Defense date*: June 28, 2019. *M.S. advisor*: Weifeng Su
15. Doraditya Nandanamudi, Paper-based Ultra-thin, Low Cost SIGFOX LPWAN Modules. *Defense data*: May 14, 2018. *M.S. advisor*: Josep Jornet
16. Sinjini Banerjee, The Hierarchical Recursive Least Squares in the Presence of Sparse Outliers. *Defense date*: May 14, 2019. *M.S. advisor*: Kostas Slavakis
17. Hyosung Kim, Maximum Capacity and Relay Designs for Airborne MIMO Relay Communication Systems. *Defense date*: July 21, 2017. *M.S. advisor*: Weifeng Su
18. Mahasweta Bhattacharya, Study and Analysis of Thermal Behavior of Human Blood Cells Due to In-Vivo Optimal Communication. *Defense data*: May 15, 2017. *M.S. advisor*: Josep Jornet
19. Amit, Design, Implementation and Validation of a Low-Power Wide Area Network Flat Module for the Internet of Things. *Defense date*: April 28, 2017. *M.S. advisor*: Josep Jornet
20. Chang Ren, Image Reconstruction Using Partial K-Space With Compressed Sensing-Sense and Sparse Blip. *Defense date*: April 12, 2017. *M.S. advisor*: Leslie Ying.
21. Ke Li, Analysis of Expected Route Surviving-Time and Power Optimization for Linear Multi-Hop Networks. *Defense date*: Nov. 11, 2015. *M.S. advisor*: Weifeng Su.

22. Ning Zhao, Quantifying causality. *Defense date*: Aug. 14, 2015. *M.S. advisor*: Michael Langberg.
23. Vishrut Vaibhav, Optimal L1-Principal Component Analysis on Reconfigurable Hardware. *Defense date*: June 24, 2015. *M.S. advisor*: Dimitris Pados.
24. Prateek Kumar Singh, Graphene-Based Plasmonic Phase Modulator for Terahertz-Band Communication. *Defense date*: May 14, 2015. *M.S. advisor*: Josep Jornet.
25. Sreya Harshad Vedant, Multi-User Interference in Pulse-Based Terahertz-Band Communication: Analytical Model and Multi-Physics Simulation. *Defense date*: May 12, 2015. *M.S. advisor*: Josep Jornet.
26. Wan Kim, Study of Parallel MR Imaging Techniques. *Defense date*: May 8, 2015. *M.S. advisor*: Leslie Ying.
27. Ren He, Highly Accelerated 3D Parallel Imaging with Transitional Auto-Calibration (3D-PITA). *Defense date*: April 14, 2015. *M.S. advisor*: Leslie Ying.
28. Vishesh Seshadri, Design and Implementation of Magnetic Induction-Based Underground Sensor for Vehicle Detection Using USRP. *Defense date*: Jan. 6, 2015. *M.S. advisor*: Zhi Sun.
29. Chen Song, ASDTab: A Computer-Vision Based In-Home ASD Assessment Tool on Unmodified Tablet Computers. *Defense date*: May 18, 2014. *M.S. advisors*: Leslie Ying and Wenyao Xu.
30. Meghna Vaidya, Predicting Stock Market Index Trends Through Various Attributes of Twitter Data. *Defense date*: Apr. 18, 2014. *M.S. advisor*: Tommaso Melodia.
31. Cedric Lolliot, Small Sample Support Adaptive MVDR/MMSE Filtering for MIMO OFDM Systems. *Defense date*: Dec. 16, 2013. *M.S. advisor*: Dimitris Pados.
32. Xilin Bai, Implementation of Decode-and-Forward Cooperative Communication Protocol Based on USRPs and GNU Radio. *Defense date*: Nov. 7, 2013. *M.S. advisor*: Weifeng Su.
33. Vignesh Kumar. *Defense date*: Aug. 16, 2013. *M.S. advisor*: Zhi Sun.
34. Yifan Sun. *Defense date*: May 10, 2013. *M.S. advisor*: Tommaso Melodia.
35. Anu Saji. *Defense date*: May 3, 2013. *M.S. advisor*: Tommaso Melodia.
36. Jithin Jagannath. *Defense date*: May 3, 2013. *M.S. advisor*: Tommaso Melodia.
37. Sivakumar Kandappan Singaravavelu, The iPad as a Tool for Simulation and Sensing. *Defense date*: Dec. 5<sup>th</sup>, 2011. *M.S. advisor*: Albert Titus.

## PROFESSIONAL MEMBERSHIPS

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- Senior Member, IEEE
- Member, IEEE Communications Society
- Member, IEEE Signal Processing Society
- Member, ACM

## SERVICE

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### PROFESSIONAL ACTIVITIES AND SERVICE TO SCIENTIFIC COMMUNITY

- **Review Panels**
  - NSF SWIFT Panel 2021
  - NSF CPS Panel 2018
- **Organizing Committee**
  - Buffalo Day for 5G and Wireless Internet of Things ([2023](#), [2022](#), [2021](#), [2020](#), [2019](#))

- DCOSS Workshop – Machine Learning for Smart Wireless Networks (ML-SWiN: [2022](#), [2021](#))
- IEEE WoWMoM Workshop – Wireless Networking, Planning, and Computing for UAV Swarms (SwarmNet: [2023](#), [2022](#), [2021](#), [2020](#), [2019](#))
- **Editorial Board Member**
  - IEEE Communications Surveys and Tutorials ([COMST](#): Summer 2013 – Spring 2019)
- **Editor/Guest Editor**
  - Area Editor KSII Transactions on Internet and Information Systems ([TIIS](#))
  - Editor KSII Transactions on Internet and Information Systems ([TIIS](#))
  - Special Issue series on Internet of Things (IoT) Optimization for KSII Transactions on Internet and Information Systems ([TIIS](#))
- **Track Chair/Co-Chair/Session Chair**
  - Session Chair: IEEE International Workshop on Multimedia Signal Processing (*MMSP*) (Multimedia Communications and Network 1-P and 2-P: 2020)
  - Symposium Co-Chair: IEEE ICNC AI and Machine Learning for Communications and Networking Symposium (2021)
  - Session Chair: IEEE SAM Workshop – Signal Processing and Communications for Resilient Autonomous Swarms (2018)
  - Co-Chair: International Conference on Wireless Communications and Signal Processing – Media and Signal Processing for Communications Symposium (WCSP: 2014)
- **Technical Program Committees**
  - IEEE INFOCOM Workshop – Distributed Machine Learning in Fog Networks (FOGML: [2023](#))
  - IEEE Wireless Sensor, Robot and UAV Networks (WiSARN: [2022](#), [2021](#))
  - IEEE WCNC ([2021](#))
  - IEEE ICC Mobile and Wireless Networks (MWN: [2023](#), [2021](#))
  - IEEE GLOBECOM Workshop – Next-Generation Radio Access Networks (NxtGenRAN: [2022](#))
  - IEEE GLOBECOM Mobile and Wireless Networks (MWN: [2022](#), [2020](#), [2019](#), [2018](#), [2017](#))
  - IEEE INFOCOM 2020 Workshop – Wireless Communications and Networking in Extreme Environments (WCNEE: [2020](#), [2019](#), [2018](#), [2017](#))
  - Multi-Robot and Multi-Agent Systems (MRS: [2019](#))
  - Packet Video Workshop ([2019](#), [2018](#))
  - EAI ADHOCNETS ([2018](#))
  - IEEE INFOCOM Workshop – 5G & Beyond – Enabling Technologies and Applications (WS – 5G: [2017](#))
  - IEEE GLOBECOM Workshop – Emerging Technologies for 5G Wireless Cellular Networks (ET5G: [2016](#), [2015](#); Wi5G: [2014](#); B4G: [2013](#))
  - EAI ADHOCNETS Workshop – Convergence of Wireless Directional Network Systems and Software Defined Networking ([2016](#))
  - International Conference on Computer Communication and Networks (ICCCN) – Wireless LAN, Ad Hoc, and Mesh Networks (WAM) Track ([2016](#))



- International Conference on Wireless Communications and Signal Processing (WCSP) – Emerging Areas in Wireless Communications Symposium ([2014](#))
- International Workshop on Quality of Multimedia Experience (QoMEX: [2013](#))
- **Reviewer** (Transactions, Journals, and Magazines only)
  - **IEEE:** IEEE Trans. on Circuits and Systems for Video Technology, IEEE Trans. on Communications, IEEE Trans. on Wireless Communications, IEEE Transactions on Green Communications and Networking, IEEE Communications Letters, IEEE Communications Magazine, IEEE Communications Surveys & Tutorials, IEEE Trans. on Computers, IEEE Trans. on Image Processing, IEEE Trans. on Mobile Computing, IEEE Trans. on Vehicular Technologies, IEEE Trans. on Multimedia, IEEE Journal on Selected Areas in Communications, IEEE Trans. on Signal Processing, IEEE Trans. on VLSI, IEEE Systems Journal, IEEE Internet of Things Journal
  - **EURASIP:** EURASIP Journal on Wireless Communications and Networking.
  - **Elsevier:** Ad-hoc Networks, Computer Networks, and Image Communication.
  - **Other:** Journal of Combinatorial Optimization, The Computer Journal, Signal Processing: Image Communication

## UNIVERSITY AND DEPARTMENT SERVICE

- **Graduate and Undergraduate Student Activities**
  - EE Director of Undergraduate Studies (Summer 2021 – Present)
  - EE study abroad adviser (Fall 2019-Summer 2021)
  - SEAS freshman faculty mentor for EE (2018-2020)
  - EE department scholarship review committee (2018-2021)
  - Faculty representative, EE graduate student orientation (2011-2019)
  - EE senior student advisor (2014-2015)
  - Judge, EE graduate poster competition (Spring 2015)
  - EE undergraduate grievance committee (Spring 2015-present)
  - SEAS grievance committee (Spring 2015-present)
  - Faculty representative, Open House (2011-2015)
- **Faculty Mentor**
  - Prof. Zhangyu Guan (Summer 2021 – Present)
  - Prof. Luis Herrera (Spring 2017 – Present)
- **Accreditation**
  - Selected for one-on-one meeting with ABET evaluator (Fall 2020)
  - Pilot evaluator of new ABET data collection system (Fall 2016)
- **Search Committees and Faculty Hiring**
  - SEAS Senior Academic Advisor search committee (Fall 2022 – Spring 2023)
  - EE faculty search committee for Signals, Communications, and Networking faculty position (Spring 2018; Spring 2016; Spring 2015)
  - EE faculty search committee for Digital Electronics and Microcontrollers, Embedded/Reconfigurable Circuits and Systems faculty position (Spring 2014)
  - EE Research Administrator search committee (Fall 2013)

- **Faculty Senate** (Fall 2017 – Fall 2018)
- **Curriculum**
  - New course creation, EAS 240: Introduction to Programming for Engineers (Fall 2014)
  - New course creation, EE 305: Applied Probability (Spring 2013)
  - New course creation, EE 565: Video Communications (Fall 2011)