

Igor Kadota

MIT, office 32-D671
+1 (617) 800 4806
kadota@mit.edu
www.igorkadota.com

Research Vision

I aim to enable future large-scale communication networks to support time-sensitive and safety-critical applications such as Internet-of-Things, Industry 4.0 and Intelligent Transportation Systems. Towards this vision I use rigorous theory to develop network control algorithms, and platforms such as Software Defined Radios (SDRs) and Raspberry Pi's to validate them in the wild. My current research centers on algorithms for wireless networks and leverages both theory and practice.

Education

- Ph.D. **Massachusetts Institute of Technology (MIT)**
Communication Networks, expected July 2020
Thesis: WiFresh - Age of Information from Theory to Implementation
Eytan Modiano (chair), Moe Win, Mohammad Alizadeh and Mor Harchol-Balter
- S.M. **Massachusetts Institute of Technology (MIT)**
Communication Networks, 2016
- S.M. **Technological Institute of Aeronautics (ITA), Brazil**
Telecommunications, 2013
- B.Sc. **Technological Institute of Aeronautics (ITA), Brazil**
Electrical Engineering, 2010

Awards and Honors

- 2019–2020 **Thomas G. Stockham Jr. Fellowship** given annually by the MIT School of Engineering to a graduate student in "recognition of outstanding academic record, exceptional background, and promising future."
- 2019 **Best Paper Award Finalist at ACM MobiHoc** for our paper entitled *Minimizing the Age of Information in Wireless Networks with Stochastic Arrivals*.
- 2018 **Best Paper Award at IEEE INFOCOM** for our paper entitled *Optimizing Age of Information in Wireless Networks with Throughput Constraints*. **This research was featured at MIT News, ACM Technews, Science Daily, Campus Technology, et al.**
- 2018 **MIT AeroAstro Graduate Teaching Assistantship Award** given annually by the Department of Aeronautics and Astronautics to a graduate student "who has demonstrated conspicuous dedication and skill in helping fulfill a subject's educational objectives."
- 2017 **Best Presentation Award** at the MIT LIDS Student Conference for the presentation of the paper entitled *Minimizing Age of Information in Broadcast Wireless Networks*.
- 2011–2013 **Scholarship** from CAPES (Brazilian federal agency) throughout the S.M. in ITA.
- 2010 **Best Senior Thesis** of the Department of Electrical Engineering of ITA in 2010.

Publications

- [1] Yin Sun, Eytan Modiano, Rajat Talak and **Igor Kadota**, *Age of Information: A New Metric for Measuring Information Freshness*, Morgan and Claypool Publishers, 2019. **[Book in preparation]**
- [2] **Igor Kadota** and Eytan Modiano, “Minimizing the Age of Information in Wireless Networks with Stochastic Arrivals,” Submitted to IEEE Transactions on Mobile Computing, 2019.
- [3] **Igor Kadota**, Abhishek Sinha and Eytan Modiano, “Scheduling Algorithms for Optimizing Age of Information in Wireless Networks with Throughput Constraints,” IEEE/ACM Transactions on Networking, 2019.
- [4] **Igor Kadota** and Eytan Modiano, “Minimizing the Age of Information in Wireless Networks with Stochastic Arrivals,” in Proceedings of ACM MobiHoc, 2019. **[Best Paper Award Finalist]**
- [5] **Igor Kadota**, Abhishek Sinha, Elif Uysal-Biyikoglu, Rahul Singh and Eytan Modiano, “Scheduling Policies for Minimizing Age of Information in Broadcast Wireless Networks,” IEEE/ACM Transactions on Networking, vol. 26, no. 6, pp. 2637–2650, Dec. 2018.
- [6] Rajat Talak, **Igor Kadota**, Sertac Karaman and Eytan Modiano, “Scheduling Policies for Age Minimization in Wireless Networks with Unknown Channel State,” in Proceedings of IEEE ISIT, June 2018, pp. 2564–2568.
- [7] **Igor Kadota**, Abhishek Sinha, Eytan Modiano, “Optimizing Age of Information in Wireless Networks with Throughput Constraints,” in Proceedings of IEEE INFOCOM, April 2018, pp. 1844–1852. **[Best Paper Award]**
- [8] **Igor Kadota**, Elif Uysal-Biyikoglu, Rahul Singh and Eytan Modiano, “Minimizing Age of Information in Broadcast Wireless Networks,” in Proceedings of IEEE Allerton, Sept. 2016, pp. 844–851.
- [9] Kyu Seob Kim, Chih-Ping Li, **Igor Kadota** and Eytan Modiano, “Optimal Scheduling of Real-Time Traffic in Wireless Networks with Delayed Feedback,” in Proceedings of IEEE Allerton, Sept. 2015, pp. 1143–1149.
- [10] **Igor Kadota**, Andrea Baiocchi and Alessandro Anzaloni, “Kalman Filtering: Estimate of the Numbers of Active Queues in an 802.11e,” Elsevier Computer Communications, vol. 39, pp. 54–64, Feb. 2014.

From Theory to Practice in Research and Teaching

- 2019 Created a **Wireless Networking Testbed** to evaluate the performance of our network control algorithms in a realistic operating environment. The testbed is composed of ten state of the art SDRs, twenty Raspberry Pi’s, and five powerful workstations. Selected the equipment, assisted in writing a DURIP proposal, purchased the equipment, assembled the laboratory, implemented our novel algorithms, and designed experiments to evaluate their performance.
- 2017 Created a customized **Radio Lab** to complement the lectures at the Communication Systems & Networks course at MIT. Selected the equipment, purchased sixteen teaching SDRs, assembled the laboratory, and designed five complete experiments.

Mentoring and Teaching

- 2017–2019 Mentored four undergraduate students as part of the Undergraduate Research Opportunities Program (UROP) at MIT. In general, their projects involved:
- Studying wireless communication protocols;
 - Implementing algorithms in SDRs or Raspberry Pi's;
 - Creating experiments to evaluate the performance of the algorithms.
- 2016–2019 Gave multiple lectures for graduate and undergraduate students in communications and networks classes at MIT.
- Spring 2019 **Teaching Assistant for the Radio Lab**, Communication Systems & Networks, MIT
- Spring 2018 ◦ Conducted the laboratory, developed laboratory scripts, and graded assignments;
- Spring 2017 ◦ Student evaluation of my work as a TA was (on average) 6.9 out of 7.0;
- Received the TA award in 2018 for my work creating and conducting the Radio Lab.
- Summer 2017 Completed the Kaufman Teaching Certificate Program offered by the Teaching and Learning Lab at MIT. Some of the covered topics were: Designing a Course and Constructing a Syllabus, Interactive Teaching & Active Learning, and Teaching Inclusively.
- Spring 2016 **Teaching Assistant**, Communication Systems & Networks, MIT
- Held weekly office hours, offered exam review sessions, and assisted in the design of problem sets and exams;
 - Created a new MATLAB project in which students were able to simulate and experiment with a communication link;
 - Student evaluation of my work as a TA was 6.9 out of 7.0.
- 2011–2012 **Math Teacher**, Brazilian local government
- Prepared and lectured weekly classes for underprivileged middle school students.

Service

- 2015–2019 Served as a reviewer for multiple journals and conferences in the field, including:
- IEEE/ACM Transactions on Networking (ToN);
 - IEEE Transactions on Information Theory (IT);
 - IEEE International Conference on Computer Communications Workshop (INFOCOM);
 - IEEE International Symposium on Information Theory (ISIT).
- 2015–2019 Served in multiple committees at MIT, including:
- Co-Chair of the LIDS Student Conference in 2018;
 - Co-Chair of the LIDS Social Committee in 2015 and 2019;
 - Member of the LIDS Mentoring Committee in 2017 and 2018;
 - Member of the Westgate Executive Committee in 2019.

Professional Experience

- 2013–2014 **Network Engineer**, Mectron - Defense and Technology, Brazil
- Optimized Network layer and Data Link layer algorithms for a Mobile Ad-hoc Network using cross-layer techniques. Collaborated intensively with the Radio Frequency and the Application teams. Developed simulations using ns-2, MATLAB and Python.

References

Eytan Modiano

Department of Aeronautics and Astronautics
Associate Director and Professor, MIT LIDS
modiano@mit.edu

Moe Win

Department of Aeronautics and Astronautics
Professor, MIT LIDS
moewin@mit.edu

Mor Harchol-Balter

Department of Computer Science
Professor, CMU
harchol@cs.cmu.edu