

Marcos M. Vasconcelos

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Education

- **University of Maryland** College Park, MD
Ph.D. Electrical Engineering Jan. 2008 - Aug. 2016
 - Thesis: Optimality of event-based policies for decentralized estimation over shared networks
 - Advisor: Prof. Nuno C. Martins
- **Federal University of Pernambuco** Recife, Brazil
M.Sc. Electrical Engineering Apr. 2004 - Apr. 2006
 - Thesis: Iterative decoding of Low-Density Parity-Check codes
 - Advisor: Prof. Valdemar C. da Rocha, Jr.
- **Federal University of Pernambuco** Recife, Brazil
B.Sc. Electrical Engineering Oct. 1998 - Mar. 2004
 - Thesis: A Matlab toolbox for signal processing over finite fields
 - Advisors: Profs. Hélio Magalhães de Oliveira and Ricardo M. Campelo de Souza

Employment

- **Dept. of Electrical Engineering** University of Southern California
Postdoctoral research associate Sep. 2016 - present
 - Host: Prof. Urbashi Mitra
- **Dept. of Electrical and Computer Engineering** University of Maryland, College Park
Research assistant Jan. 2012 - Aug. 2016
- **Dept. of Electrical and Computer Engineering** University of Maryland, College Park
Teaching assistant Jan. 2010 - Dec. 2011
- **Dept. of Electrical and Computer Engineering** University of Hawaii at Manoa
Teaching assistant Sep. 2006 - Dec. 2007
- **Laboratory of Devices and Nanostructures** Federal University of Pernambuco
Intern Jan. 2004 - Mar. 2004

Research interests

- Cyber-physical systems
- Networked decision making systems
- Model-free/data-driven control and optimization
- Decentralized estimation, control and optimization
- Systems biology
- Sharing economy

Awards & Honours

- **Travel Award to Japan**
54th IEEE Conference on Decision and Control 2015
- **Distinguished Teaching Assistant Award**
U. of Maryland 2012
- **Fulbright fellowship**
Fulbright Commission 2006–2010
- **Distinguished Undergraduate Student Award**
Federal University of Pernambuco 1999

Research Experience

- **Energy and delay: network optimization in CPS human sensing systems** USC
Research Associate Fall 2016 – Fall 2017
 - Optimal design of observation-driven sensor scheduling policies
 - PI's: Profs. Urbashi Mitra and Ashutosh Nayyar
- **Optimization-based modeling of bat-prey capture dynamics** UMD/Johns Hopkins U.
Research Assistant Spring 2015 – Summer 2016
 - Model predictive flight control in denied sensing areas
 - PI's: Profs. Nuno C. Martins (UMD) and Cindy Moss (JHU)
- **Distributed estimation over shared networks** UMD
Research Assistant Spring 2012 - Summer 2016
 - Policy design and optimization algorithms for decentralized estimation
 - PI: Prof. Nuno C. Martins
- **Stochastic teams and optimization** Queen's University
Visiting Student Summer 2012
 - Host: Prof. Serdar Yüksel
- **Iterative decoding of low-density parity check codes** UH
Research Assistant Fall 2006 - Fall 2007
 - PI: Marc P. C. Fossorier
- **Design, analysis and implementation of LDPC codes** UFPE
Research Assistant Spring 2004 - Spring 2006
 - PI: Prof. Valdemar C. da Rocha, Jr.

Publications

Journal Articles

3. **M. M. Vasconcelos** and U. Mitra. “Observation-driven scheduling for remote estimation of two Gaussian sources.” (to be submitted), 2018.
2. **M. M. Vasconcelos** and N. C. Martins. “Optimal remote estimation of discrete random variables over the collision channel,” *IEEE Transactions on Automatic Control* (**under review**), 2017.
1. **M. M. Vasconcelos** and N. C. Martins. “Optimal estimation over the collision channel,” *IEEE Transactions on Automatic Control*, vol. 62, no. 1, pp. 321–336, 2017.

Journal Articles in Preparation

3. **M. M. Vasconcelos**, M. Gagrani, A. Nayyar, and U. Mitra, “An optimal sensor scheduling strategy for sequential networked estimation with constrained communication.”
2. **M. M. Vasconcelos** and U. Mitra. “Fundamental limits of implicit communication over collision networks.”
1. **M. M. Vasconcelos**, U. Mitra, O. Camara and J. Boedicker. “Bacterial quorum sensing as a networked decision system: socially optimal thresholding strategies and a global game.”

Conference Proceedings

8. **M. M. Vasconcelos**, U. Mitra, O. Camara, K. P. Silva, and J. Boedicker, “Bacterial quorum sensing as a networked decision system” *IEEE International Conference on Communications*, 2018 (accepted).
7. **M. M. Vasconcelos**, A. Nayyar and U. Mitra. “Optimal sensor scheduling strategies in networked estimation,” *IEEE Conference on Decision and Control*, Melbourne - Australia, 2017.
6. **M. M. Vasconcelos** and U. Mitra. “The multiple-access collision channel without feedback: capacity region and a mutual information game,” *55th Allerton Conference on Communication, Control and Computing*, Monticello - Illinois, 2017.
5. **M. M. Vasconcelos** and U. Mitra. “Observation-driven sensor scheduling,” *IEEE International Conference on Communication*, Paris - France, 2017.
4. **M. M. Vasconcelos** and N. C. Martins. “The structure of optimal communication policies for remote estimation over the collision channel with private and common observations,” *55th IEEE Conference on Decision and Control*, Las Vegas - Nevada, 2016.
3. **M. M. Vasconcelos** and N. C. Martins. “Optimal threshold strategies for estimation over the collision channel with communication costs,” *54th IEEE Conference on Decision and Control*, Osaka - Japan, 2015.
2. **M. M. Vasconcelos** and N. C. Martins. “Remote estimation games over shared networks,” *51st Annual Allerton Conference on Communication, Control, and Computing*, Monticello - Illinois, 2014.
1. **M. M. Vasconcelos** and N. C. Martins. “Estimation over the collision channel: structural results,” *50th Annual Allerton Conference on Communication, Control, and Computing*, Monticello - Illinois, 2013.

Book Chapters

1. **M. M. Vasconcelos** and N. C. Martins. “A survey on remote estimation problems,” *Principles of Cyber-physical Systems*, S. Roy and S. Das, Eds., Cambridge University Press (**in press**).

Presentations

- **Estimation of discrete random variables over the collision channel** Princeton - New Jersey
IEEE Conference on Information Sciences and Systems March 2018
- **Estimation over the collision channel & Observation-driven scheduling** Pittsburgh - Pennsylvania
Carnegie Mellon University March 2018
- **Optimal sensor scheduling strategies in networked estimation** San Diego - California
Information Theory and Applications February 2018
- **Collaborative estimation over the collision channel** Las Vegas - Nevada
Communication Aware Control and Robotics Workshop December 2016
- **Optimal remote estimation over the collision channel**
CommNetS Seminar (USC) September 2016
- **Optimal remote estimation over the collision channel**
Prof. George Pappas' Group Meeting (UPenn) April 2016
- **Estimation over the collision channel with minimum probability of error**
Communication, Control and Signal Processing Seminar (U. of Maryland) April 2016
- **Estimation over the collision channel with communication costs** YouTube video
ECEGSA Academic Seminar (U. of Maryland) December 2015
- **Distributed estimation over the collision channel**
Communication, Control and Signal Processing Seminar (U. of Maryland) November 2014

Participation in Workshops and Conferences

- **8th NSF Cyber-Physical Systems PI Meeting** Alexandria - Virginia
Lightning Talk + Poster November 2017
- **Communication Aware Control and Robotics Workshop** Las Vegas - Nevada
Speaker + round table panelist November 2016
- **Workshop on Future Trends in Networks, Optim. and Controls** Los Angeles - California
Lightning Talk + Poster December 2014

Academic Service and Contributions

- Reviewer for the following journals:
 - IEEE Transactions on Automatic Control
 - Automatica
 - Systems and Control Letters
 - IEEE Transactions on Wireless Communications
 - IEEE Transactions on Information Theory
- Reviewer for the following conferences:
 - Conference on Decision and Control
 - American Control Conference

Teaching Experience

- **Signals and Systems (ENEE 322)** UMD
Teaching Assistant *Spring 2010 – Fall 2011*
 - Instructors: Profs. Anthony Ephremides, Steven A. Tretter, Nuno C. Martins and Carol Espy-Wilson
- **Programming for Engineers (EE 160)** UH
Teaching Assistant *Fall 2007*
 - Instructor: Prof. David Y. Y. Yun
- **Probability and Statistics (EE 342)** UH
Teaching Assistant *Fall 2006 – Spring 2007*
 - Instructors: Profs. James Yee and Anthony Kuh

Technical Skills

- Programming Languages
 - Matlab and C
- Specialized Software
 - Mathematica

Languages

- Portuguese (native)
- English (fluent)

References

Prof. Nuno C. Martins

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Phone: (301) 405-9198
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Prof. Serdar Yüksel

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Department of Mathematics and Statistics
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Prof. Ashutosh Nayyar

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Prof. Urbashi Mitra

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Prof. Steven I. Marcus

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