Jorge Ortiz, Ph.D.

[32-09 82 street, 2nd Floor, Fliushing, NY 11370]

jortiz@alum.mit.edu
http://jorgeortizphd.info

Research Interests

My research research is in applied machine learning for sensor-based systems with a focus on sustainability and healthcare. I am interested in how machine learning techniques can be applied and adapted to engineered systems in real-world settings in order to improve outcomes and increase collaboration between systems and humans.

Education

- **University of California, Berkeley** — Berkeley, CA
  Doctor of Philosophy in Computer Science; — *May. 2010 – Dec. 2013*
  - Dissertation: A Platform Architecture for Sensor Data Processing and Verification in Buildings
- **University of California, Berkeley** — Berkeley, CA
  Masters of Science in Computer Science; — *Aug. 2007 – May 2010*
  - Thesis: Multichannel Reliability Assessment in Real World WSNs
  - Relevant Courses: Advanced Systems Seminar I & II, Graduate Networking, Sensor Networks Seminar, Combinatorial Algorithms, Parallel Computation Algorithms, Statistical Learning Theory, Practical Machine Learning.
- **Massachusetts Institute of Technology** — Cambridge, MA
  Bachelors of Science in Computer Science and Engineering; — *Aug. 1999 – May 2003*
  - Thesis: Connection Oriented Routing Environment (CORE): A Generalized Device Interconnect

Academic Appointments

- **Rutgers University** — New Brunswick, NJ
  Assistant Professor — *August 2018 – Present*
  –

Honors and Invited Talks

- **Keynote speaker** Workshop on Smart and Connected Indoor Environments *in conjunction with IEEE International Conference on Sensing, Communication and Networking (SECON 2017)*
- Qualcomm Innovation Fellowship Finalist 2011
- NSF Graduate Fellowship Honorable Mention 2008
- Ford Foundation Diversity Fellowship Honorable Mention 2008

Publications

Conferences and Journals

[1] Arka A. Bhattacharya, Dezhi Hong, David Culler, **Jorge Ortiz**, Kamin Whitehouse, and Eugene Wu. "Automated Metadata Construction to Support Portable Building Applications (**Best Paper Honorable Mention, 1st Highest Review Score**)". In: *Proceedings of the 2nd ACM International Conference on Embedded Systems for Energy-Efficient Built Environments*. BuildSys '15. 2015.

[2] Stephen Dawson-Haggerty, Xiaofan Jiang, Gilman Tolle, **Jorge Ortiz**, and David Culler. "sMAP: A Simple Measurement and Actuation Profile for Physical Information". In: *Proceedings of the 8th ACM Conference on Embedded Networked Sensor Systems*. SenSys '10. Zurich, Switzerland: ACM, 2010, pp. 197–210. ISBN: 978-1-4503-0344-6.

[3] Romain Fontugne, **Jorge Ortiz**, Nicolas Tremblay, Pierre Borgnat, Patrick Flandrin, Kensuke Fukuda, David Culler, and Hiroshi Esaki. "Strip, Bind, and Search: A Method for Identifying Abnormal Energy Consumption in Buildings". In: *Proceedings of the 12th International Conference on Information Processing in Sensor Networks*. IPSN '13. 2013.

[4] Raghu Ganti, Mudhakar Srivatsa, Dakshi Agrawal, Petros Zerfos, and **Jorge Ortiz**. "MP-trie: Fast Spatial Queries on Moving Objects". In: *Proceedings of the Industrial Track of the 17th International Middleware Conference*. Middleware Industry '16. 2016.

[5] Dezhi Hong, Hongning Wang, **Jorge Ortiz**, and Kamin Whitehouse. "The Building Adapter: Towards Quickly Applying Building Analytics at Scale (**Best Paper Honorable Mention, 2nd Highest Review Score**)". In: *Proceedings of the 2nd ACM International Conference on Embedded Systems for Energy-Efficient Built Environments*. BuildSys '15. 2015.

[6] Chien-Chin Huang, Qi Chen, Zhaoguo Wang, Russell Power, **Jorge Ortiz**, Jinyang Li, and Zhen Xiao. "Spartan: A Distributed Array Framework with Smart Tiling". In: *2015 USENIX Annual Technical Conference (USENIX ATC 15)*. July 2015.

[7] Wei-Han Lee, **Jorge Ortiz**, and Ruby Lee. "Time Series Segmentation through Automatic Feature Learning". In: ***Under Submission***. 2017.

[8] Mehdi Maasoumy, **Jorge Ortiz**, David Culler, and Alberto Sangiovanni-Vincentelli. "Flexibility of Commercial Building HVAC Fan as Ancillary Service for Smart Grid". In: *IEEE Green Energy and Smart Systems Conference*.

[9] **Jorge Ortiz**, Catherine Crawford, and Franck Le. "DeviceMien: Network Device Behavior Modeling for Identifying Unknown IoT Devices". In: *ACM/IEEE Conference on Internet of Things Design and Implementation*. ACM, 2019.

[10] **Jorge Ortiz** and David Culler. "Multichannel Reliability Assessment in Real World WSNs". In: *Proceedings of the 9th ACM/IEEE International Conference on Information Processing in Sensor Networks*. IPSN '10. 2010.

[11] **Jorge Ortiz**, C.R. Baker, Daekyeong Moon, R. Fonseca, and I. Stoica. "Beacon Location Service: A Location Service for Point-to-Point Routing in Wireless Sensor Networks". In: *Information Processing in Sensor Networks, 2007. IPSN 2007. 6th International Symposium on*. 2007, pp. 166–175.

[12] Shiqiang Wang and **Jorge Ortiz**. "Non-negative matrix factorization of signals with overlapping events for event detection applications". In: *The 42nd IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP 2017*. 2017.

Workshops, Demos and Technical Reports

[1] "An information-centric energy infrastructure: The Berkeley view". In: *Sustainable Computing: Informatics and Systems* 1.1 (2011), pp. 7 –22.

[2] Arka Bhattacharya, David Culler, Dezhi Hong, Kamin Whitehouse, and **Jorge Ortiz**. "Automated Metadata Transformation for A-priori Deployed Sensor Networks". In: SenSys '14 (2014), pp. 364–365.

[3] Arka Bhattacharya, David E. Culler, **Jorge Ortiz**, Dezhi Hong, and Kamin Whitehouse. "Enabling Portable Building Applications through Automated Metadata Transformation". In: UCB/EECS-2014-159 (2014). URL: http://www2.eecs.berkeley.edu/Pubs/TechRpts/2014/EECS-2014-159.html.

[4] Stephen Dawson-Haggerty, **Jorge Ortiz**, Xiaofan Jiang, Jeff Hsu, Sushant Shankar, and David Culler. "Enabling Green Building Applications". In: HotEmNets '10 (2010), 4:1–4:5.

[5] Stephen Dawson-Haggerty, **Jorge Ortiz**, Xiaofan Fred Jiang, and David E. Culler. "The Effect of Link Churn on Wireless Routing". In: UCB/EECS-2008-109 (2008). URL: http://www2.eecs.berkeley.edu/Pubs/TechRpts/2008/EECS-2008-109.html.

[6] Dezhi Hong, **Jorge Ortiz**, Arka Aloke Bhattacharya, and Kamin Whitehouse. "Sensor-Type Classification in Buildings". In: *CoRR* abs/1509.00498 (2015). URL: http://arxiv.org/abs/1509.00498.

[7] Dezhi Hong, **Jorge Ortiz**, Kamin Whitehouse, and David Culler. "Towards Automatic Spatial Verification of Sensor Placement in Buildings". In: BuildSys'13 (2013), 13:1–13:8.

[8] Jeff Hsu, Prashanth Mohan, Xiaofan Jiang, **Jorge Ortiz**, Sushant Shankar, Stephen Dawson-Haggerty, and David Culler. "HBCI: Human-building-computer Interaction". In: BuildSys '10 (2010), pp. 55–60.

[9] Xiaofan Jiang, Jay Taneja, **Jorge Ortiz**, Arsalan Tavakoli, Prabal Dutta, Jaein Jeong, David Culler, Philip Levis, and Scott Shenker. "An Architecture for Energy Management in Wireless Sensor Networks". In: *SIGBED Rev.* 4.3 (July 2007), pp. 31–36.

[10] Bong Jun Ko, **Jorge Ortiz**, Theodoros Salonidis, Maroun Touma, Dinesh Verma, Shiqiang Wang, Xiping Wang, and David Wood. "Acoustic Signal Processing for Anomaly Detection in Machine Room Environments: Demo Abstract". In: BuildSys '16 (2016).

[11] S. Lanzisera, S. Dawson-Haggerty, X. Jiang, H. Y. Cheung, J. Taneja, J. Lai, **J. Ortiz**, D. Culler, and R. Brown. "Wireless electricity metering of miscellaneous and electronic devices in buildings". In: (2011), pp. 16–19. DOI: 10.1109/FIIW.2011.6476843.

[12] Maanit Mehra, Aditya Bagri, **Jorge Ortiz**, and Xiaofan Jiang. "Image Analysis for Identifying Mosquito Breeding Grounds". In: IoTPDA '16 (2016).

[13] Arsalan Tavakoli, Prabal Dutta, Jaein Jeong, Sukun Kim, **Jorge Ortiz**, David Culler, Phillip Levis, and Scott Shenker. "A Modular Sensornet Architecture: Past, Present, and Future Directions". In: *SIGBED Rev.* 4.3 (July 2007), pp. 49–54. ISSN: 1551-3688. DOI: 10.1145/1317103.1317112. URL: http://doi.acm.org/10.1145/1317103.1317112.

[14] **Jorge Ortiz**. "A Platform Architecture for Sensor Data Processing and Verification in Buildings". In: UCB/EECS-2013-196 (2013). URL: http://www2.eecs.berkeley.edu/Pubs/TechRpts/2013/EECS-2013-196.html.

[15] **Jorge Ortiz**. "A System for Managing Physical Data in Buildings". In: UCB/EECS-2010-128 (2010). Ed. by David E. Culler. URL: http://www2.eecs.berkeley.edu/Pubs/TechRpts/2010/EECS-2010-128.html.

[16] **Jorge Ortiz** and David Culler. "Exploring Diversity: Evaluating the Cost of Frequency Diversity in Communication and Routing (**Best Poster Award**)". In: SenSys '08 (2008), pp. 411–412.

[17] **Jorge Ortiz**, Chien-Chin Huang, and Supriyo Chakraborty. "Fast Image Clustering on Network of Mobile Phones". In: ICML '16 (2016).

[18] **Jorge Ortiz** and Younghun Kim. "Project Tidy: Ranking Time Series for Smart Energy Systems: Poster Abstract". In: BuildSys '16 (2016).

[19] **Jorge Ortiz**, Yongwoo Noh, Gavin Saldanha, David Su, and David Culler. "Towards Real-time, Fine-grained Energy Analytics in Buildings Through Mobile Phones". In: BuildSys '12 (2012).

Service

1. TPC Member Energy Data and Analytics Workshop at e-Energy 2018
2. TPC Member Sensys 2016 (Demo Session), IPSN 2014, 2017, Buildsys 2016, 2017, 2018
3. Organizing Committee Sensys/Buildsys 2016, 2017

4. The 26th International Conference on Computer Communication and Networks (ICCCN 2017)
5. TPC Member 1st Workshop on Smart and Connected Indoor Environments (SCIE) in conjunction with IEEE International Conference on Sensing, Communication and Networking (SECON 2017)
6. TPC Member 1st Workshop on Internet of Thing Physical Data Analytics (IoTPDA) in conjunction with IEEE International Conference on Sensing, Communication and Networking (SECON 2016)
7. TPC Member DCOSS 2016 (The annual International Conference on Distributed Computing in Sensor Systems)
8. TPC Member ALGOSENSORS 2017
9. TPC IEEE workshop on Big Data Management for the Internet of Things (BIOT2017)
10. Member of CSGSA Faculty Candidate Evaluation Committee, UCB Computer Science Div. (2008, 2009, 2010)
11. President of CSGSA Faculty Candidate Evaluation Committee, UCB Computer Science Div. (2011)
12. Chair, Internet of Things Professional Interest Community (IoT-PIC) IBM Research at Watson Labs.

Patents

References

[1] Jorge J Ortiz Theodoros Salonidis Rahul Urgaonkar Dinesh C Verma Xiping Wang Xiping Wang Keith W Grueneberg Bong Jun Ko. "Matching untagged data sources to untagged data analysis applications". Patent US 14/743,130 (US). June 2015.

[2] Jorge J Ortiz Theodoros Salonidis Rahul Urgaonkar Dinesh C Verma Xiping Wang Xiping Wang Keith William Grueneberg Bong Jun Ko. "Extending cloud computing to on-premises data". Patent US 9342357 (US). May 2016.

Industry Experience

- **IBM Research** — Yorktown Heights, NY
  Research Staff Member — *Dec. 2013 – Present*
  - Research work on systems and algorithms for physical analytics in buildings and IoT, deploying machine learning on resource constrained devices, and distributed systems and algorithms for large-scale machine learning applications.
- **Spire** — San Francisco, CA
  Senior Software Engineer — *Jan. 2013 – Sept. 2013*
  - Designed and wrote communication kernel for arduino-based, nano satellites.
- **Oracle Corporation** — Burlington, MA
  Software Engineer — *Sept. 2003 – Feb. 2007*
  - Assisted in designing, debugging, and maintaining several features in Oracle Enterprise Planning and Budgeting (EPB) software suite; include, but not limited to the setup of PL/SQL packages, schemas, and interfaces to the Javabased UI.

References

Prof. David E. Culler
CS Division
University of California, Berkeley
465 Soda Hall
Berkeley, CA
culler@cs.berkeley.edu

Prof. Randy Katz
CS Division
University of California, Berkeley
775 Soda Hall
Berkeley, CA
randy@cs.berkeley.edu

Dr. Catherine Crawford
Distinguished Engineer Cognitive Internet of Things
IBM Research
catcraw@us.ibm.com

Prof. Prabal Dutta
EECS
University of California, Berkeley
550C Cory Hall
prabal@berkeley.edu

Prof. Xiaofan (Fred) Jiang
ECE
Columbia University
1008 Northwest Corner Building
jiang@ee.columbia.edu

Prof. Jay Taneja
ECE
UMASS, Amherst
309C Knowles Engineering Bldg
jtaneja@umass.edu