JUAN JOSE JARAMILLO

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EDUCATION

University of Illinois — *Urbana-Champaign, IL*

Doctor of Philosophy, Electrical and Computer Engineering — *Dec. 2009*
GPA: 3.95/4.00

Master of Science, Electrical Engineering — *Dec. 2005*
GPA: 3.73/4.00

Universidad Pontificia Bolivariana — *Medellin, Colombia*

Bachelor of Science, Electronics Engineering — *Aug. 1998*
GPA: 4.36/5.00 - Summa Cum Laude

EXPERIENCE

Department of ECE – U. of Illinois at Urbana-Champaign — *Urbana, IL*

Lecturer and Course Coordinator — *Jan. 2015 - Present*

- Improving and teaching ECE 120: Introduction to Computer Engineering. Included in the *list of teachers ranked as excellent by their students* – Fall 2015, Fall 2016, Spring 2017
- Coordinated 3 instructors, 30+ staff and 400+ students in ECE 120: Introduction to Computer Engineering for 3 semesters. Coordination improvements led to 6 instructors and 13 Teaching Assistants (TAs) being included in the *list of teachers ranked as excellent by their students* – Fall 2015, Spring 2016, Fall 2016, as well as 1 TA winning and 3 other TAs being nominated for the *Harold L. Olesen Award* for outstanding effort in undergraduate teaching – Fall 2016, an achievement never before seen in the time the course has been offered

Department of Applied Math – Universidad EAFIT — *Medellin, Colombia*

Assistant Professor — *Jan. 2012 – Nov 2014*

- Developed a distributed admission controller for single-hop wireless networks. The algorithm can determine the available bandwidth that can be allocated to a new request without knowledge or estimation of the capacity region
- Analyzed the performance of the longest-queue-first (LQF) algorithm to fulfill delay-constrained traffic in single-hop wireless networks. Results bound the efficiency gap of LQF compared to the optimal algorithm
- Analyzed the performance of LQF to service multi-hop traffic. The LQF algorithm is proved to be throughput-optimal for linear wireless networks under the one-hop interference model
- Designed and taught courses in calculus, linear and non-linear optimization

Department of ECE – Iowa State University *Ames, IA*

Postdoctoral Research Associate *Jan. 2010 - Nov. 2011*

- Mentored two Ph.D. students, from developing original and out-of-the-box research ideas to successfully writing and publishing results in internationally-recognized conferences and journals. Five conference papers and two journal papers were co-authored with students
- Developed algorithm to improve live video streaming on peer-to-peer networks. Playout continuity is improved by presenting a solution to the problem of information loss due to peer churn
- Designed algorithm to guarantee the truthful disclosure of user's service rate requirements at an access point without the need of monetary mechanisms. The algorithm developed is order-optimal with respect to the maximum number of users that can be admitted
- Developed scheduler to provide quality of service (QoS) requirements in wireless networks for short-lived, real-time traffic. Results show that the algorithm maximizes the total network utility while meeting strict deadline constraints

Coordinated Science Laboratory – University of Illinois *Urbana-Champaign, IL*

Research Assistant *May 2004 - Dec. 2009*

- Developed a joint congestion controller and scheduler for wireless ad hoc networks that seamlessly supports best-effort and real-time traffic in a single framework. Results prove that the algorithm is throughput-optimal and is able to optimize total network utility
- Designed an optimal admission control and routing algorithm for wireless multihop networks to enforce minimum bandwidth requirements between source and destination pairs. The algorithm makes no assumptions on the parameters of the traffic requests and can be implemented in a distributed manner
- Developed an incentive mechanism for cooperative wireless ad hoc networks that ensures the best option for any user is to cooperate. The mechanism is robust to imperfect measurements, and is able to successfully cope with groups of colluding nodes that do not want to cooperate
- Designed a low-complexity, throughput-optimal scheduling algorithm that reduces delay by up to 49% in high-speed switches compared to previous proposals

Qualcomm Inc. *Bridgewater, NJ*

Intern *May – Aug. 2008*

- Built simulator in C++ for FlashLinQ's long-range, peer-to-peer wireless communications technology
- Built simulator in C++ for IEEE 802.11 wireless technology
- Implemented TCP in C++ from scratch
- Ran simulations to study the performance of FlashLinQ, understand its impact on TCP connections, and compare it to IEEE 802.11
- Presented simulation results to Qualcomm's executive and senior design team. Results

were used to improve FlashLinQ's design

Empresas Públicas de Medellín *Medellin, Colombia*

Electrical Engineer *Jan. 1999–Aug. 2003*

- Led multiple groups to write technical specifications of telecommunication elements for parent company and subsidiaries. Specifications were used to decrease purchase prices by increasing economies of scale
- Presented technical specifications developed within the company to technical committees at the national standards organization (ICONTEC). Most recommendations were adopted
- Monitored and inspected supply contracts of telecommunication elements. Inspections guaranteed highest quality of elements for the execution of infrastructure projects

PUBLICATIONS

Journal Articles

- X. Kang, W. Wang, J. J. Jaramillo, and L. Ying, "On the performance of largest-deficit-first for scheduling real-time traffic in wireless networks," *IEEE/ACM Transactions on Networking*, vol. 24, no. 1, pp. 72-84, Feb. 2016.

  [Online]. Available: http://dx.doi.org/10.1109/TNET.2014.2360365
- X. Kang, J. J. Jaramillo, and L. Ying, "Stability of longest-queue-first scheduling in linear wireless networks with multihop traffic and one-hop interference," *Queueing Systems*, vol. 80, no. 3, pp. 273-291, Jul. 2015.

  [Online]. Available: http://dx.doi.org/10.1007/s11134-015-9441-2
- J. J. Jaramillo and R. Srikant, "Optimal scheduling for fair resource allocation in ad hoc networks with elastic and inelastic traffic," *IEEE/ACM Transactions on Networking*, vol. 19, no. 4, pp. 1125-1136, Aug. 2011.

  [Online]. Available: http://dx.doi.org/10.1109/TNET.2010.2100083
- J. J. Jaramillo, R. Srikant, and L. Ying, "Scheduling for optimal rate allocation in ad hoc networks with heterogeneous delay constraints," *IEEE Journal on Selected Areas in Communications*, vol. 29, no. 5, pp. 979-987, May 2011.

  [Online]. Available: http://dx.doi.org/10.1109/JSAC.2011.110508
- J. J. Jaramillo and R. Srikant, "A game theory based reputation mechanism to incentivize cooperation in wireless ad hoc networks," *Elsevier Ad Hoc Networks*, vol. 8, no. 4, pp. 416-429, Jun. 2010.

  [Online]. Available: http://dx.doi.org/10.1016/j.adhoc.2009.10.002
- J. J. Jaramillo, F. Milan, and R. Srikant, "Padded frames: A novel algorithm for stable scheduling in load-balanced switches," *IEEE/ACM Transactions on Networking*, vol. 16, no. 5, pp. 1212-1225, Oct. 2008.

  [Online]. Available: http://dx.doi.org/10.1109/TNET.2007.906654

Conference Proceedings

- X. Kang, J. J. Jaramillo, and L. Ying, "Stability of longest-queue-first scheduling in linear wireless networks with multihop traffic and one-hop interference," in *Proc. 52nd IEEE Conference on Decision and Control (CDC)*, Firenze, Italy, Dec. 10-13, 2013, pp. 3312-3317. [Online]. Available: http://dx.doi.org/10.1109/CDC.2013.6760389
- X. Kang, W. Wang, J. J. Jaramillo, and L. Ying, "On the performance of largest-deficit-first for scheduling real-time traffic in wireless networks," in *Proc. 14th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, Bangalore, India, Jul. 29/Aug. 1, 2013, pp. 99-108.

  [Online]. Available: http://dx.doi.org/10.1145/2491288.2491298
- J. J. Jaramillo and L. Ying, "Distributed admission control without knowledge of the capacity region," in *Proc. IEEE INFOCOM*, Turin, Italy, Apr. 14-19, 2013, pp. 335-339.

  [Online]. Available: http://dx.doi.org/10.1109/INFCOM.2013.6566790
- X. Kang, J. J. Jaramillo, and L. Ying, "Impacts of peer churn on P2P streaming networks," in *Proc. 50th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Monticello, IL, USA, Oct. 1-5, 2012, pp. 1417-1424.

  [Online]. Available: http://dx.doi.org/10.1109/Allerton.2012.6483384
- J. J. Jaramillo, S. Liu, and L. Ying, "Optimal scheduling of real-time messages in peer-to-peer wireless networks," in *Proc. 45th Asilomar Conference on Signals, Systems and Computers (ASILOMAR)*, Pacific Grove, CA, USA, Nov. 6-9, 2011, pp. 1610-1616.

  [Online]. Available: http://dx.doi.org/10.1109/ACSSC.2011.6190291
- X. Kang, J. J. Jaramillo, and L. Ying, "A strategy-proof and non-monetary admission control mechanism for wireless access networks," in *Proc. 7th International ICST Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine)*, ser. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, X. Zhang and D. Qiao, Eds., vol. 74, Houston, TX, USA, Nov. 17-19, 2010, pp. 172-187.

  [Online]. Available: http://dx.doi.org/10.1007/978-3-642-29222-4_13
- J. J. Jaramillo and R. Srikant, "Optimal scheduling for fair resource allocation in ad hoc networks with elastic and inelastic traffic," in *Proc. IEEE INFOCOM*, San Diego, CA, USA, Mar. 15-19, 2010, pp. 1-9.

  [Online]. Available: http://dx.doi.org/10.1109/INFCOM.2010.5462048
- J. J. Jaramillo and R. Srikant, "Admission control and routing in multi-hop wireless networks," in *Proc. 47th IEEE Conference on Decision and Control (CDC)*, Cancun, Mexico, Dec. 9-11, 2008, pp. 2356-2361.

  [Online]. Available: http://dx.doi.org/10.1109/CDC.2008.4738981
- J. J. Jaramillo and R. Srikant, "DARWIN: Distributed and adaptive reputation mechanism for wireless ad-hoc networks," in *Proc. 13th Annual ACM International Conference on Mobile Computing and Networking (MobiCom)*, Montreal, Canada, Sep. 9-14, 2007, pp. 87-97.

  [Online]. Available: http://dx.doi.org/10.1145/1287853.1287865

- F. Milan, J. J. Jaramillo, and R. Srikant, "Achieving cooperation in multihop wireless networks of selfish nodes," in *Proc. Workshop on Game Theory for Communications and Networks (GameNets)*, Pisa, Italy, Oct. 14, 2006, pp. 1-10.

  [Online]. Available: http://dx.doi.org/10.1145/1190195.1190197

- J. J. Jaramillo, F. Milan, and R. Srikant, "Padded frames: A novel algorithm for stable scheduling in load-balanced switches," in *Proc. 40th Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, USA, Mar. 22-24, 2006, pp. 1732-1737.

  [Online]. Available: http://dx.doi.org/10.1109/CISS.2006.286434

- F. Milan, J. J. Jaramillo, and R. Srikant, "Performance analysis of reputation-based mechanisms for multi-hop wireless networks," in *Proc. 40th Annual Conference on Information Sciences and Systems (CISS)*, Princeton, NJ, USA, Mar. 22-24, 2006, pp. 12-17.

  [Online]. Available: http://dx.doi.org/10.1109/CISS.2006.286423

HONORS AND AWARDS

List of teachers ranked as excellent by their students – Fall 2015, Fall 2016, Spring 2017 *May 2017*

For instructors whose overall teaching effectiveness and quality of course are rated as excellent by their students

Poster Award *Aug. 2010*

Given to the top 15% presentations by the Defense Threat Reduction Agency (DTRA) at the Basic Research Program Technical Review

Fulbright Fellowship *Aug. 2002*

Awarded to study a Master of Science program in Electrical Engineering at the University of Illinois, Urbana-Champaign

Summa Cum Laude Degree *Oct. 1998*

For obtaining the best GPA in the Department of Electronics Engineering, Universidad Pontificia Bolivariana

Participation in "Bachilleres por Colombia" *Dec. 1992*

Event organized by the state-owned company Ecopetrol as an acknowledgement for obtaining the second best score in the ICFES high school test in the province of Antioquia, Colombia (387 points out of 400)

INVITED SEMINARS

- "Optimal Scheduling in Ad Hoc Networks with Elastic and Inelastic Traffic," Iowa State University, Mar. 24 2010
- "Optimal Scheduling in Ad Hoc Networks with Elastic and Inelastic Traffic," Purdue University, Apr. 28 2010

ACTIVITIES

Vice-Chair

- 3rd CSL Student Conference on Communication, Control and Signal Processing (2008)

Technical Program Committee Member

- Special Session on Design of Cyber-Physical Systems (DCPS), Euromicro DSD (2013)
- ACM/IEEE ICCPS (2013)
- IEEE INFOCOM (2012, 2013)
- COMSNETS (2012)
- ICCCN (2010)
- ICST QShine (2010)

Journal Referee

- ACM Transactions on Autonomous and Adaptive Systems (since 2012)
- Elsevier Computer Networks, COMNET (since 2009)
- Elsevier Microprocessors and Microsystems (since 2014)
- IEEE/ACM Transactions on Networking (since 2004)
- IEEE Communications Magazine (since 2010)
- IEEE Journal on Selected Areas in Communications, special issue "Trading Rate for Delay at the Transport and Application Layers" (2010)
- IEEE Transactions on Automatic Control (since 2009)
- IEEE Transactions on Communications (since 2008)
- IEEE Transactions on Information Forensics & Security (since 2010)
- IEEE Transactions on Information Theory (since 2011)
- IEEE Transactions on Mobile Computing (since 2010)
- IEEE Transactions on Parallel and Distributed Systems (since 2011)
- IEEE Transactions on Vehicular Technology (since 2011)

Conference Referee

- IEEE INFOCOM (2010, 2012, 2013)
- DSD (2013)
- ACM/IEEE ICCPS (2013)
- COMSNETS (2012)
- ITC (2011)
- RAWNET and WNC3 (2011)

- ICCCN (2010)
- ICST QShine (2010)
- IEEE CDC (2008, 2010)
- MILCOM (2010)

Membership

- IEEE Member (since 2006)
- IEEE Senior Member (since 2014)

SKILLS

C, C++, Matlab, Unix network programming, Machine Learning