

Marcela M. Gomez

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Education

- 2013–2017 **Ph.D. in Information Science with concentration in Telecommunications**, *University of Pittsburgh*, Pittsburgh, PA.
Dissertation Title: “Spectrum Markets: from *naked* spectrum to virtualized commodities”.
Advisor: Martin B.H. Weiss, Ph.D
GPA 3.923/4.0
- 2011–2012 **MSc in Telecommunications**, *University of Pittsburgh*, Pittsburgh, PA.
GPA 3.906/4.0
- 2004–2009 **B.S. in Electronics Engineering**, *Universidad del Azuay*, Cuenca, Ecuador.
GPA 45.89/50.0

Experience

Current Position

- Sept.2017–
Present **Visiting Research Assistant Professor**, *Department of Informatics and Networked Systems*, School of Computing and Information – University of Pittsburgh, Pittsburgh, PA.
Courses Taught:
○ Independent Study
○ Data Analytics (Online Version)
○ Intro to Telecom and Networks
○ Doctoral Seminar
Other Activities:
○ Research Assistant to the Vice Chancellor for Research of the University of Pittsburgh

Research

- Jan.2015 – **Graduate Student Researcher**, *University of Pittsburgh*, Pittsburgh, PA.
Aug.2017 U.S National Science Foundation Grant 1443978 “Virtualized Wireless Networks and Their Impact on Capacity Markets”
○ Study of markets for virtualized spectrum resources
○ Utilizing agent-based modeling, explore different market configurations and the resulting market viability
○ Explore resource allocation alternatives (i.e., spectrum auctions and matching games)
○ Analyze applicable Policy and Economics frameworks

Aug. 2013 – **Graduate Student Researcher**, *University of Pittsburgh*, Pittsburgh, PA.

Dec. 2014 U.S. National Science Foundation Grant 1247546 “Techno-Economic Models of Secondary Spectrum Usage”

- Investigated the limitations of spectrum fungibility
- Modified an existing spectrum trading tool and included fungibility limitations considerations
- Analyzed the impact of lack of fungibility on the viability of spectrum markets
- Improved the spectrum trading tool and included virtualized spectrum as a new commodity to trade
- Studied the changes in the market viability results when including virtualization methods

Teaching

Summer and Fall 2018 – **Visiting Research Assistant Professor**, *School of Computing and Information – University of Pittsburgh*, Pittsburgh.

- Instructor of **Data Analytics** - Online Session

Fall 2017 **Visiting Research Assistant Professor**, *School of Computing and Information – University of Pittsburgh*, Pittsburgh.

- Co-instructor of the Doctoral Seminar on “Governance in Information Systems” (Graduate level course)
- Instructor of Introduction to Telecommunications and Networks (Graduate and Undergraduate level course)

Summer 2015 **Teaching Fellow**, *School of Information Sciences - University of Pittsburgh*, Pittsburgh, PA.

- Introduction to Telecommunications and Networks (Graduate and Undergraduate level course)

Spring 2013 **Teaching Assistant**, *School of Information Sciences - University of Pittsburgh*, Pittsburgh, PA.

- Co-instructor of Computer Networking Laboratory (Undergraduate and Graduate Level course)

March – July 2011 **Instructor**, *School of Science and Technology of Universidad del Azuay*, Cuenca, Ecuador.

Undergraduate Level Courses:

- Instructor of Control Theory in the Electronics Engineering Department
- Instructor of Control Theory in the Production and Operations Engineering Department

Sep. – Feb. 2008 **Teaching Assistant**, *School of Science and Technology of Universidad del Azuay*, Cuenca, Ecuador.

- Electromagnetic Theory Course in the Electronics Engineering Program

Internships

Oct. – Dec. 2016 **Visiting Researcher**, *CONNECT – the Science Foundation Ireland Research Centre for Future Networks and Communications*, Dublin, Ireland.

Worked with Professor Linda Doyle on the study of secondary spectrum markets for service-driven networks.

- Developed an agent-based model for capturing the negotiations and interactions of the market entities
- Utilized matching markets concepts to model negotiations among entities
- Studied alternatives for implementing service differentiation in the market

April - June 2008 **Intern**, *Superintendencia de Telecomunicaciones (Ecuadorian Telecommunications Regulatory Body)*, Cuenca, Ecuador.

- Monitored the operations of the AM, FM and TV Broadcasting stations in Cuenca – Ecuador.
- Detected interfering radio stations in the area using spectrum analyzers.
- Created a database of the network operators in the andean region of Ecuador.
- Control test drives of the operations of the 3G and 3.5G cellular technologies in Cuenca, Ecuador
- Regular inspections of operations of 2G cellular base stations in the city of Cuenca and its surroundings

Publications

Journal Papers

- 1 **Gomez, Marcela M.**, and Weiss, M.B.H. “Wireless Network Virtualization: Opportunities for Spectrum Sharing in the 3.5 GHz Band” *EAI Endorsed Transactions on Wireless Spectrum*, 2017.
- 2 **Gomez, Marcela M.**, Weiss, M.B.H., and Krishnamurthy, Prashant “Improving Liquidity in Secondary Spectrum Markets: Virtualizing Spectrum for Fungibility” *IEEE Transactions on Cognitive Communications and Networking Forthcoming*.

Conference Papers

- 1 **Gomez, Marcela M.**, and Weiss, M. “How do limitations in spectrum fungibility impact spectrum trading?.” *TPRC Conference Paper*, 2013.
- 2 Cui, Liu, **Gomez, M.**, and Weiss, M. “Dimensions of cooperative spectrum sharing: Rights and enforcement.” *2014 IEEE International Symposium on Dynamic Spectrum Access Networks (DYSPAN)*. IEEE, 2014.
- 3 **Gomez, Marcela M.**, Cui, L., and Weiss, M. “Trading Wireless Capacity Through Spectrum Virtualization Using LTE-A.” *TPRC Conference Paper*, 2014.
- 4 Weiss, Martin B.H., Lehr, W.H., Acker, A. and **Gomez, M.M.**, “Socio-technical considerations for Spectrum Access System (SAS) design.” *2015 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*. IEEE, 2015.
- 5 **Gomez, Marcela M.**, and Weiss, Martin B.H., “Wireless Network Virtualization: Opportunities for Spectrum Sharing in the 3.5 GHz Band.” *International Conference on Cognitive Radio Oriented Wireless Networks*. Springer International Publishing, 2016.
- 6 Weiss, Martin B.H., Krishnamurthy, Prashant, and **Gomez, Marcela M.**, “How can Polycentric Governance of Spectrum Work?.” *TPRC Conference Paper*, 2016.
- 7 Weiss, Martin B.H., Krishnamurthy, Prashant, and **Gomez, Marcela M.**, “How can Polycentric Governance of Spectrum Work?.” – Revised Version. *2017 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*. IEEE, 2017.
- 8 **Gomez, Marcela M.**, Weiss, Martin B.H., McHenry, Giulia, and Doyle, Linda, “Matching Markets for Spectrum Sharing”, *TPRC Conference Paper*, 2017.
- 9 **Gomez, Marcela M.**, Weiss, Martin B.H., Lehr, William, and McHenry, Giulia, “Spectrum Valuation: Implications for Sharing and Secondary Markets”, *TPRC Conference Paper*, 2018.

- 10 Bustamante, Pedro, **Gomez, Marcela M.**, Weiss, Martin B.H., Znati, Taieb, Park, Jerry, Das, Debarun, Rose, Stephanie, “Agent-based Modeling Approach for Developing Enforcement Mechanisms in Spectrum Sharing Scenarios: An Application for the 1695 - 1710 MHz Band”, *TPRC Conference Paper*, 2018.

Opinion Articles

- 1 “Spectrum Sharing a way to keep Philly on cutting edge”. Published by *The Philadelphia Inquirer* on February 10, 2017. Available at: http://www.philly.com/philly/opinion/20170210_Commentary_Spectrum_sharing_a_way_to_keep_Philly_on_cutting_edge.html

Honors

- January 2016 **Best Student Paper Award**, *Pacific Telecommunications Council*.
Paper: Wireless Network Virtualization as an enabler of Spectrum Sharing
- September 2015 **Participant in the TPRC Graduate Student Consortium**.
Selected by the Telecommunications Policy Research Conference Graduate Student Consortium board to discuss my doctoral research with leaders from Industry and Academia
- 2011–2012 **Fulbright Scholarship**.
Granted by the Fulbright Commission – Ecuador for pursuing a Masters Degree in Telecommunications in the United States
- 2009 **“Honorato Vazquez” Award**.
In recognition for obtaining the highest GPA of the class of 2009 in the Electronics Engineering program.
Granted by Universidad del Azuay, Cuenca – Ecuador

Presentations

- IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN).**
- Mar.2017 Research paper: “*How can Polycentric Governance of Spectrum Work?*”
Pacific Telecommunications Council.
- Jan.2016 Research paper: “*Wireless Network Virtualization as an enabler of Spectrum Sharing*”
Telecommunications Policy Research Conference (TPRC).
- Sep.2018 Research paper: “*Spectrum Valuation: Implications for Sharing and Secondary Markets*”
- Sep.2017 Research paper: “*Matching Markets for Spectrum Sharing*”
- Sep.2015 Poster: “*Wireless Network Virtualization: Opportunities for Spectrum Sharing in the 3.5 GHz Band.*”
- Sep.2014 Research paper: “*Trading Wireless Capacity Through Spectrum Virtualization Using LTE-A.*”
- Sep.2013 Research paper: “*How do limitations in spectrum fungibility impact spectrum trading?*”

Activities and Memberships

- October 2018–Present **Institutional Mentoring Program Across a Community of Color (IMPACT) Mentee**, *University of Pittsburgh*, Pittsburgh.
Nominated by the Dean of the School of Computing and Information to participate in the inaugural IMPACT cohort of the University of Pittsburgh
- January 2018–Present **Volunteer**, *Humane Animal Rescue*, Pittsburgh.
Volunteering activities include Dog Walker and Foster, and dog handling at HAR events.
- 2017–Present **Member of the Networking Networking Women Group**.
Community of researchers in the communications and networking research fields.
- 2017–Present **Member of IEEE Women in Engineering**.
- 2015–Present **IEEE Member**.
- 2014–Present **Member of the Women in Information Sciences Group**, *University of Pittsburgh*.
Co-President from Fall 2015 to Summer 2016
- 2008 **President of the Student Council**.
School of Science and Technology - Universidad del Azuay, Cuenca, Ecuador

Programming Skills

- Agent-based Modeling **Programming Environment: Repast Symphony, NetLogo and Matlab**.
Application:
 - Study the design and development of secondary spectrum markets.
 - Explore governance methods for spectrum sharing settings
- Data Analytics **Programming Environment: R, Python and Tableau**.
Application:
 - Process agent-based model outputs
 - Evaluate market model results based on market viability metrics
 - Provide useful visualizations and insights from large datasets

Languages

- Spanish **Mother tongue**
- English **Fluent**
- French **Fluent**