

## Curriculum Vitae

Nayda G. Santiago, Ph.D.

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### Professional Preparation

Ph.D.	Electrical Engineering	Michigan State University, East Lansing, MI, USA	2003
M.Eng.	Electrical Engineering	Cornell University, Ithaca, NY, USA	1990
B.S.	Electrical Engineering	University of Puerto Rico, Mayaguez Campus, Mayaguez, PR, USA	1989

### Research Areas

- High Performance Computing
- Complexity in Computing Systems
- Engineering Education/ Women in Engineering

### Appointments

**Jul 2015 to Present: Professor**, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus  
Jul 2008-Jun 2015: Associate Professor, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus.  
Sept 2003-Jun 2008: Assistant Professor, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus.  
Aug 2000- Aug 2003: Instructor, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus.  
1997-2000: Research Assistant, Department of Electrical and Computer Engineering, Michigan State University.  
Summer 1996: Summer Intern, Cornell Theory Center, Cornell University  
1995-1996: Teaching Assistant, Department of Electrical and Computer Engineering, Michigan State University.  
1990-1994: Instructor, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus.  
1989 - 1990: Research Assistant, School of Electrical and Computer Engineering, Cornell University  
1988-1989: Lab Instructor, Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez Campus.

### Research Grants and Contracts

- NSF, Sept 2018 – Aug 2023, \$480,000 for UPRM, Total \$3,665,604.00, “NSF INCLUDES Alliance: Computing Alliance of Hispanic-Serving Institutions”, PI at UPRM, Subcontract
- Google, Explore CRC program, Aug 2018 to May 2019, \$35,000, “Increasing Hispanic Women participation in Undergraduate Computing Research”, PI
- Harris Corp., Aug 2018 – Sept 2019, \$40,000, “A Space for Fostering Creative Thinking in Cyberphysical Systems (CPS) & the Internet of Things (IoT)”, Co-Pi (PI Manuel Jimenez).
- NSF, Oct 2018 - , Sept 2021, \$650,000 A Support Ecosystem to Expand Capabilities and Opportunities for STEM Undergraduates Following Hurricane Maria”, Co-PI, (PI Monica Alfaro)

- NSF, Oct 2018 – Sept 2021, \$999,906.00, “Recruiting, Retaining, and Engaging Academically Talented Students from Economically Disadvantaged Groups into a Pathway to Successful Engineering Careers”, Senior Personnel, (PI Manuel Jimenez).
- Lockheed Martin, May 2018 – Apr 2019, \$4,000, “Undergraduate research project: LiDAR Based Autonomous Landing of Unmanned Aerial Vehicles”, PI.
- NSF, Oct 2016 – Sept 2021, \$3,873,960, “BPC-A: Computing Alliance of Hispanic-Serving Institutions--Building a Resilient, Sustainable, and Adaptable CAHSI Ecosystem”, Co-PI
- UPRM, Sept 2014 – Jun 2015, \$29,450, “Implementing High Impact Best Practices in Education at UPRM”, Co-PI
- NEH, Jan 2012 – Jun 2016, \$99,737; “The Convergence of Culture and Science: Expanding the Humanities Curriculum Institution: University of Puerto Rico, Mayaguez”, Co-PI
- NSF, Dec 15, 2009-Nov 30, 2013; \$1,300,00 total, \$90,000 for UPRM; “BIAT: A Biomedical Image Analysis Testbed”, Co-PI
- NSF, BPC AE, September 1, 2010 to Aug 31, 2015, \$3.6 Millions overall, \$284,358 for UPRM, “Computing Alliance of Hispanic Serving Institutions”, Senior Personnel
- Rectoria UPRM, December 5, 2009 to May 5, 2010, \$25,387.00, “Propuesta para la creacion de cursos enlace temático en inteligencia artificial”, PI Dana Collins, CoPI
- NSF, WIMS ERC, Nov 11, 2009 to Aug 31, 2010, \$48,000, “Continuation of Integrating Software and Hardware Components for the WIMS testbeds”, PI
- NSF, BPC AE, December 1, 2008 to Nov 30, 2012, \$1.8 Millions total, \$201,470 for UPRM, CAHSI: Computing Alliance of Hispanic-Serving Institutions, Senior Personnel
- CRA-W and CREW program, \$ 9,500, Sept 5, 2008 to Sept 4, 2009, “Evaluating the use of GPUs for Hyperspectral Image Processing”, PI
- NSF, Sept 2007 – Aug 2008; \$64,994; “Integrating Software and Hardware Components of the WIMS testbeds”, PI
- NSF, Sept 2006 – Aug 2007, \$64,994; “Analyzing the Effect of Algorithmic Decisions on Power Consumption”, PI
- NSF, Sept 2005 – Aug 2006; \$65,000; “Code Development for the Neural Prosthesis and EMT testbeds for the WIMS ERC”, PI
- NSF, Sept 2004 – Aug 2005; \$39,740; “Porting Benchmarks and Environmental Monitoring Testbed Application Coding for the WIMS microcontroller”, PI
- NSF; Feb 2004 – Aug 2004; \$20,108; “Evaluation of the WIMS microcontroller and FP support”, PI

## Publications

**NOTE: Undergraduate Research Assistant Students marked in BOLD**

1. Hilton Alers Valentin, **Calos G. Rivera-Velazquez**, J. Fernando Vega-Riveros, Nayda G. Santiago, “Towards a Principled Computational System of Syntactic Ambiguity Detection and Representation”, 11<sup>th</sup> International Conference on Agents and Artificial Intelligence – Natural Language Processing in Artificial Intelligence, ICAART/NLPinAI 2019, Prague, Feb 2019.
2. **Sujeily Fonseca, Samuel Gonzalez, Brian Rodriguez, Chaliana Rolon, Annamary Cartagena, Alberto Canela, Jorge Bobonis, Josean Bosque, Lexdyel Mendez, Melody Seda, Tahiri Fuentes**, “Educational Nanotechnology Videogame to Inspire Middle and High School Students to Pursue STEM Related Professional Careers”, Frontiers in Education, San Jose, CA, Oct 2018.
3. Brian Landron, J Fernando Vega-Riveros, Aidsa Santiago, Nayda G. Santiago, “Text Classification of Student Predicate Use for Automatic Misconception Categorization”, Frontiers in Education, San Jose, CA, Oct 2018.

4. Lourdes Medina-Avilés, **Ilka Rodríguez-Calero, Juan Nieves-Miranda, Jayson Soto, Wesley Martínez-Camacho, Andrés Malines, Luis Ortiz**, and Nayda G. Santiago, “Decision-Support for the Medical Device Development Process: A Web-based Collaborative Platform”, Symposium of Health Informatics in Latin America and the Caribbean & Hacking Medicine in the Caribbean (SHILAC 2015), San Juan, Puerto Rico, Nov 20 – 22, 2015.
5. Dana L. Collins, Nayda G. Santiago, Hector Huyke, Christopher Papadopoulos, J. Fernando Vega, Ana Nieves-Rosa, Anderson Brown, Raul Portuondo, Matias J Cafaro and Matthew Landers , Increasing Student Engagement Through the Development of Interdisciplinary Courses: Linking Engineering and Technology, the Sciences, and the Humanities, Frontiers in Education 2015, El Paso, TX, Oct 21-24, 2015.
6. Jose A. Ortiz, N. G. Santiago, J. G. Colom, HSense: A High Performance Framework for Distributed Weather Sensor Networks, Ibersensor, Revista Iberoamericana de Sensores, Vol 7, No. 4, 2012.
7. **Gabriel Perez-Irizarry, Francisco de la Cruz-Sanchez**, Brian Landron-Rivera, N. G. Santiago, M. Velez-Reyes. Developing a portable GPU library for hyperspectral image processing. In Algorithms and Technologies for Multispectral, Hyperspectral and Ultraspectra Imagery XVII, Proc. of SPIE, Vol. 8390, 2012.
8. Trigueros-Espinosa, Blas, M. Velez-Reyes, N. G. Santiago, Evaluation of the graphics processing unit architecture for the implementation of target detection algorithms for hyperspectral imagery, Journal of Applied Remote Sensing 6(01), 061506, Jan 2012.
9. B.E. Trigueros, M.Velez-Reyes, S. Rosario-Torres, N. Santiago, “Evaluation of the GPU architecture for the implementation of target detection algorithms for hyperspectral imagery.” In Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII, Vol. 8048, April 2011.
10. Magana, A.J., Santiago-Roman, A. Santiago-Santiago, N., Aceros, C., Marshall, B. and Matson, E. (2011). Students Understanding of Computational Problem-Solving Tasks. Proceedings of the 118th ASEE Annual Conference & Exposition. June 26 - 29, Vancouver, BC, Canada.
11. B.E. Trigueros, M.Velez-Reyes, S. Rosario-Torres, N. Santiago, “Evaluation of the GPU architecture for the implementation of target detection algorithms for hyperspectral imagery.” In Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII, Vol. 8048, April 2011.
12. D. Mera and N. Santiago. “Low Power Software Techniques for Embedded Systems Running Real Time Operating Systems”, . 53rd IEEE International Midwest Symposium on Circuits and Systems (MWSCAS 2010, Seattle, Washington, Aug. 2010.
13. D. A. Ortiz and N. Santiago, “Impact of Source Code Optimizations on Power Consumption of Embedded Systems”, 2008 Joint IEEE North-East Workshop on Circuits and Systems and TAISA Conference, NEWCAS-TAISA, June 22-25, 2008, p 133-136.
14. **David Gonzalez, Christian Sanchez**, Ricardo Veguilla, Nayda G. Santiago, Samuel Rosario, Miguel Velez-Reyes. Abundance Estimation Algorithms Using NVIDIA CUDATM Technology. Proceedings of SPIE -- Volume 6966, Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XIV, 69661E, Orlando, FL, March 2008.
15. D.A. Ortiz and N.G. Santiago. High-level optimization for low power consumption on microprocessor-based systems. 50th IEEE International Midwest Symposium on Circuits and Systems (MWSCAS'07), pages 1265 –1268, Montreal, Canada, Aug. 2007.
16. M. A. Jiménez, N. G. Santiago, J. F. Vega, **C. Rubert, G. Bonilla, I. Torres, C. Maldonado, J. Malavé, and R. Rosario**. Integrating Fundamental and Advanced Concepts in a Rounded

- Capstone Design Experience in Computer Engineering. Frontiers in Education Conference 2007, (FIE 2007, Milwaukee, Wisconsin, Oct 10- 13, 2007)
17. Jimenez, M., Nieves, A., Santiago, N. G., Lopez, V., Pomales-Garcia, C., and Vega, J.F. (2007, June), An Analysis Of Behavior Patterns In Generation Y Engineering Students And Their Implications In The Teaching Learning Process. Paper presented at 2007 Annual Conference & Exposition, Honolulu, Hawaii. June 24-27, 2007.
  18. J. Morales, N.G. Santiago, **A. Fernandez**, "An FPGA implementation of image space reconstruction algorithm for hyperspectral imaging analysis", in Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XIII, Sylvia S. Shen; Paul E. Lewis, Editors, Proceedings of SPIE Vol. 6565 (SPIE, Bellingham, WA 2007), 65651V.
  19. N.G. Santiago, C. A. Aceros-Moreno, D. Rodriguez, "Performance measures for parameter extraction of sensor array point targets using the discrete chirp Fourier transform", in Signal Processing, Sensor Fusion, and Target Recognition XV, Ivan Kadar, Editors, Proceedings of SPIE Vol. 6235 (SPIE, Bellingham, WA 2006), 62351L.
  20. G. A. Chaparro-Baquero, N. G. Santiago, W. Rivera, J. F. Vega-Riveros, "Measuring Quantitative Dependability Attributes in Digital Publishing Using Petri Net Workflow Modeling," 2014 IEEE 12th International Conference on Dependable, Autonomic and Secure Computing, pp. 119-128, 2nd IEEE International Symposium on Dependable, Autonomic and Secure Computing (DASC'06), 2006.
  21. Morales, J.; Medero, N.; Santiago, N.G.; **Sosa, J.**, "Hardware Implementation of Image Space Reconstruction Algorithm using FPGAs," in Circuits and Systems, 2006. MWSCAS '06. 49th IEEE International Midwest Symposium on , vol.1, no., pp.433-436, 6-9 Aug. 2006.
  22. R. Veguilla, N.G. Santiago, D. Rodriguez, "Issues in Terrain Visualization for Environmental Monitoring Applications", in Fourth LACCEI International Latin American and Caribbean Conference for Engineering and Technology, June 21-23, 2006, Mayaguez, PR.
  23. Rodriguez, D.A.; Santiago, N.G., "Integrating novel methodologies, tools, and IT resources for graduate level courses in high performance computing and advanced signal processing algorithms," in Information Technology Based Higher Education and Training, 2005. ITHET 2005. 6th International Conference on, vol., no., pp.F3D/15-F3D/18, 7-9 July 2005
  24. Jimenez, M.; Santiago, N.G., "The supporting role of CAD/CAM tools in undergraduate research education in electrical and computer engineering," in Information Technology Based Higher Education and Training, 2005. ITHET 2005. 6th International Conference on , vol., no., pp.S3C/23-S3C/26, 7-9 July 2005.
  25. Nayda G. Santiago, Diane T. Rover, Domingo Rodriguez, "Subset Selection of Performance Metrics Describing System-Software Interactions", SC2002, Supercomputing: High Performance Networking and Computing 2002, Baltimore MD, November 16-22, 2002.
  26. Santiago, N.G.; Rover, D.T.; Rodriguez, D., "A statistical approach for the analysis of the relation between low-level performance information, the code, and the environment", The 4th Workshop on High Performance Scientific and Engineering Computing with Applications, HPSECA-02, Proceedings of the International Conference on Parallel Processing Workshops, August 18-21, 2002, Vancouver, British Columbia, Canada, Page(s): 282 -289
  27. D. T. Rover, N. G. Santiago, **M. Tsai**, "Active Learning in an Electronic Design Automation Course", 1999 IEEE Computer Society International Conference on Microelectronic Systems Education, July 19-21, 1999, Arlington, VA, Page(s) 78 - 79.
  28. M. A. Jimenez, N. G. Santiago, D. T. Rover, "Development of an FPGA-Based Scalable Floating Point Multiplier" , 1998 Field Programmable Devices Workshop (FPD'98), Ecole Polytechnique de Montreal, Montreal Canada, Jun. 1998.

29. D. Rodriguez, A. Rodriguez, N. G. Santiago, "On the Implementation of Fast Algorithms for Linear Codes Using T805 Microcomputer Arrays", 38th Midwest Symposium on Circuits and Systems, Rio de Janeiro, Brazil , 13 - 16 August 1995, Page(s) 1284 - 1287 vol. 2.
30. D. Rodriguez, N. G. Santiago, "On the Analysis and Design of Linear Codes Using MATLAB and MAPLE", Symposium on Intelligent Systems in Communications and Power, Mayaguez, PR, February 1994.
31. D. Rodriguez, N. G. Santiago, **C. Velez**, "Implementation of a New Class of FFT Algorithms on Transputer Computational Structures", 36th Midwest Symposium on Circuits and Systems, Detroit, MI, 16-18 August 1993, Page(s) 1105 - 1108 vol. 2.

## **SYNERGISTIC ACTIVITIES**

1. Leader of the Southeast Region of the Computing Alliance of Hispanic Serving Institutions. CAHSI Alliance between Hispanic Serving Institutions. Role since 2006: ARG Trainer. Promote undergraduate research and the affinity research group model among HSIs and train undergraduate students on research skills to increase the number of Hispanics in computing related areas.
2. 2017 CRA-E (Education Committee of the Computing Research Association) Undergraduate Research Faculty Mentoring Award for “providing exceptional mentorship, undergraduate research experiences, and, in parallel, guidance on admission and matriculation of their students to research-focused graduate programs in computing”.
3. Google Faculty in Residence 2018.
4. Coordinator of Google Tech – Technical Exchange program for HBCUs and HSI institutions.
5. Member of the Latinas in Computing Leadership and director of the Caribbean Celebration of Women in Computing CCWiC conferences (2014 and 2016).
6. Director of the Computer Engineering Steering Committee of the Univ. of PR Mayaguez campus. Leading curricular changes in Computer Engineering.
7. Working group for the ACM Council on Diversity & Inclusion, 2017
8. ASEE ECE division Representative to the Diversity Committee, 2017
9. Femprof - Mentored 26 female students on how to write research statements, REU opportunities, scholarships, and research opportunities to encourage them for graduate school, in particular getting a PhD and becoming faculty.

## **COLLABORATORS AND OTHER AFFILIATIONS**

1. Graduate advisors
  - Dr. Diane Rover, PhD Dissertation
  - Dr. Michael Kelly, MEng Project
2. Current Graduate Students
  - Victor Lugo, MS CpE, expected graduation Summer 2019.
3. Past Graduate Students
  - Gustavo Chaparro, MSCpE, July 2006, Faculty at Turabo University
  - Javier Morales, MSEE, February 2007, Office Naval Research
  - David Ortiz, MSEE, December 2007, PhD Student University of Texas at Dallas
  - Ricardo Vegaulla, MSCpE, December 2007, Softek Co.
  - Daniel Mera, MSCpE, July 2010, PhD Candidate EE UPRM
  - Jose Ortiz, MSCpE, December 2012, Apple
  - Manuel Oran, MS CpE, Dec 2014, Invision

- Brian Landron, MS CpE, Dec 2016, Wovenware
- 2. Member of Graduate Committees of
  - Rieman Dorval, MS CpE
  - Abigail Fuentes, MS CpE
  - Juan Manuel Sola, PhD CISE
  -
- 4. Additional students
  - 285 BS students supervised in undergraduate research using ARG model

### **Professional Activities**

- Member of the Colegio de Ingenieros y Agrimensores de PR (1989 – present)
- Lifetime Member of Society for Advancement of Chicanos and Native Americans in Science (SACNAS) (2012 – present)
- Member of ACM (2003 – present)
- Member of the ASEE (1991-2005, 2017 to present)
- Senior Member of the IEEE (1988 – present)
- Licenced Engineer in Puerto Rico: License 11970 PE
- Member of Latinas in Computing (leadership)
- One of the founding members of CAHSI
- One of the founding members of Femprof
- Member of the Academic Committee for Grace Hopper Conference 2010
- Member of the Panels, Workshops and Papers of the Grace Hopper Conference in 2012
- Member of UWIC (Underrepresented Women in Computing) since 2012
- SACNAS Conference Program Committee member (Dec 2012 - Nov 2015)
- Society of Women Engineering (SWE) (1992 - 2006)
- American Society for Engineering Education (ASEE) (1992 – 2006)
- Tau Beta Pi Honor Society (1988 – 2008)
- Phi Kappa Phi Honor Society (1988 – 2008)
- ARG Trainer for the Computing Alliance for Hispanic Serving Institutions (CAHSI) (2010 to present)

### **Honors and Awards**

2017 CRA-E Undergraduate Research Faculty Mentoring Award  
 2016 Distinguished Professor of Electrical and Computer Engineering Department Award  
 2011 Women on the Forefront of the Puerto Rico Society of Professional Engineers and Land Surveyors  
 2009 Distinguished Alumni Award of the University of Puerto Rico, Mayaguez Campus, Fundación Alumni Colegial, UPRM (Oct 24, 2009)  
 2008 HENAAC (Hispanic Engineer National Achievement Awards Conference) Education Award (Oct 11, 2008)  
 2008 Distinguished Professor of Electrical and Computer Engineering Department Award  
 2008 Distinguished Computer Engineer Award of the Puerto Rico Society of Professional Engineers and Land Surveyors (May 17, 2008)  
 2007-2008 Distinguished ECE Professor, UPRM (May 5, 2009)

**Professional Development Workshops (she has taken or attended)**

February 1-2, 2010, 2010 BPC Community Meeting, NSF - Los Angeles CA, Marriott Marina del Rey Hotel [Feb 1, Participatory Sensing: Promoting citizen science, scientific citizens, and computational thinking, 1 hour; Feb 2, Brokering Success: Becoming Institutional Agents for Latinas and Latinos in the Computer Sciences, 1 hour; Feb 2, Promising Practices for working with Community Colleges from BPC projects, 1.5 hours]

May 25 to 27, 2010, ARG Professional Development Program, University of Texas, El Paso

February 17, 2010- Federal Energy Policy, the Department of Energy and Opportunities for Puerto Rico, CIAPR

November 18, 2008 - The Dynamics of Great Teams - XX Texas Instruments - UPRM Workshop, 8 hours

November 13, 2008 - Programa Institucional de transformacion ADVANCE IT, NSF grant for Decanato de Asuntos Academicos UPRM, 5 hours.

November 6-8, 2008 - Engaging Science, Advancing Learning: General Education, Majors, and the New Global Century - Providence, Rhode Island [Nov 6, Science for All - Fostering Faculty Efforts and Institutional Transformation, 3 hours; Nov 7, Teaching and Learning Science: why change and how?, 1.5 hours; Nov 7, Successful Strategies for Attracting Liberal Arts Students to the Natural Sciences, 1.5 hours; Nov 7, Teaching and Learning for Sustainability: Imperative or Option?, 1.5 hours; Nov 7, Using Impossible Problems to Build Engagement in Science and Engineering, 1.5 hours; Nov 7, A New Science Core: Engaging Contemporary Scientific Debates, 1.5 hours; Nov 8, Undergraduate Research and the Two-Year College: Opportunities and Challenges, 1.5 hours; Nov 8, Raising the quality and level of science learning for all students, 1 hour]

**Workshops and presentations she has offered**

- How to prepare and make yourself marketable, Panel Moderator, Microsoft, April 6, 2010
- Ignite Talk 2009 Grace Hopper Conference, Tucson Arizona: Femprof - Advancing Undergraduate Female Students to a Professoriate Career: a case study.
- Tercer Foro de la filosofía de la tecnología en la Universidad: “La tecnología y la mujer: tres contextos”, 23 marzo 2010, Cecilio Ortiz, Marla Perez, Nayda Santiago

**Service**

- ICOM Computing Systems Committee Member, Fall 2008 to Spring 2010
- PhD CISE Program Committee Member, Fall 2008 to Spring 2010
- Recursos Computacionales de Facultad Committee Member, President, Fall 2008 to Spring 2010
- Coordinator of CRL (Computing Research Lab) from Fall 2008 to Fall 2019