

Diego Andrés Aponte Roa

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EDUCATION:

Michigan Technological University PhD. Electrical Engineering, Power Electronics	December 2021
University of Puerto Rico, Mayagüez Campus M.S. Electrical Engineering, Electronics	June 2009
National University of Colombia, Manizales Campus B.S. Electrical Engineering, Telematics Major	February 2006

GRANTS:

- Consortium of Hybrid Resilient Energy Systems, 2022, (\$21,566.31).
- Consortium of Hybrid Resilient Energy Systems, 2021, (\$19,458.82).
- ACT Global accelerator services, *Gardien Daycare*, 2019, (\$40,000).
- Puerto Rico Energy Center, Summer Internship, 2019, (\$600).
- Consortium for Integrating Energy System in Engineering & Science Education, 2018-2019, (\$45,801).
- Puerto Rico Energy Center, *Summer Internship*, 2018, (\$900).
- Puerto Rico Energy Center, *Summer Internship*, 2017, (\$600).
- President's Office, *Special fund for research (STEM+H)*, 2016, (\$975).
- Puerto Rico Energy Center, *Summer Internship*, 2016, (\$951).
- ACT Global accelerator services, *Gardien Alert System*, 2015, (\$114,900).
- Hit3001 - Business Competition, *Gardien Alert System*, 2015, (\$30,000).
- Inno Venture - Business Competition, *Gardien Alert System*, 2014, (\$25,000).

AWARDS:

- Patent App: 14/478,590, *System and Method for Notifying the Presence of an Unattended Child*, Publication Date: 05/14/2015.
- Graduate research and teaching assistantships, UPRM, 2006 - 2008. Tuition waiver.

PUBLICATIONS:

- **D. Aponte-Roa**, C. -W. Ten and W. W. Weaver, "*Estimation of Affected Customers and Load Loss Under Wind Storms in the Caribbean Region*," in *IEEE Systems Journal*, doi: 10.1109/JSYST.2021.3113814.
- G. Hiraldo, A. Santiago, **D. Aponte**, and M. Goenaga, "Automatic Electronic Braking System for Commercial Micro Wind Turbines," in *ASME Power Conference*, pp. 1-6, July 2021.
- D. González, J. Zabala, E. Henao, C. Ramos, and **D. Aponte**, "Rapid control prototyping platform for PV systems based on Arduino and Simulink," *R. EIA. 2021*, 18, 36.
- J. Martínez, **D. Aponte**, I. Vergara, and W. Weaver, "A Low-Cost Secure IoT Mechanism for Monitoring and Controlling Polygeneration Microgrids," *Appl. Sci. 2020*, 10, 8354.
- N. Habib, A. Flores, J. Martínez, **D. Aponte**, and A. Espinoza, "Unmanned Autonomous Aerial Navigation in GPS-Denied Environments," in *LACCEI International Multi-Conference for Engineering, Education, and Technology*, pp. 1-4, July 2020.
- **D. Aponte**, G. Guerrero, and W. Weaver, "AC Vs DC Power Efficiency Comparison of a Hybrid Wind/Solar Microgrid," in *IEEE Conference on Technologies for Sustainability*, pp. 1-5, April 2020.
- J. Martínez, C. Carvajal, and **D. Aponte**, "A Secured IoT Scheme for Microgrids Monitoring," in *IEEE Annual Computing and Communication Workshop and Conference*, pp. 1-5, January 2020.

- J. Sánchez, J. Cruz, and **D. Aponte**, "IoT Monitoring System for future DC Homes," in *IASTED International Conference - CORES*, pp. 113-117, December 2019.
- **D. Aponte**, J. Borres, X. Collazo, I. Vergara, "Study of DC electrification for future smart DC homes," in *LACCEI International Multi-Conference for Engineering, Education, and Technology*, pp. 1-4, July 2019.
- X. Collazo, J. Sanchez, L. Rendon, J. Borres, **D. Aponte**, and M Nuñez, "Control System Design for a 400W Micro Wind Turbine for DC Loads Applications," in *IEEE Annual Computing and Communication Workshop and Conference*, pp. 1-6, January 2019.
- **D. Aponte**, J. Borres, X. Collazo, and W. Weaver, "A Benchtop DC Microgrid for Renewable Energy Sources Integration," in *IEEE Annual Computing and Communication Workshop and Conference*, pp. 1-5, January 2019.
- **D. Aponte**, X. Collazo, M. Goenaga, A. Espinoza, and K. Vazquez, "Development and Evaluation of a Remote-Controlled Lawn Mower," in *IEEE Annual Computing and Communication Workshop and Conference*, pp. 1-4, January 2019.
- X. Collazo, J. Sánchez, L. Rendon, J. Borres, and **D. Aponte**, "Micro Wind Turbine Control System Design with Fail-Safe Shutdown Capability," in *IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference*, pp. 1-6, November 2018.
- **D. Aponte** and M. Lau, "Incorporating a Model-Based Approach in an Introductory Electronics Course Using Simscape," in *IEEE Frontiers in Education Conference*, pp. 1-6, October 2018.
- **D. Aponte**, L. Benitez, and E. Henao, "A low-cost digital voltmeter with temperature-measuring and data logging," in *IEEE International Instrumentation and Measurement Technology Conference*, pp. 1-5, May 2018.
- **D. Aponte**, L. Benitez, C. Velazquez, A. Espinoza, L. Feliciano, and R. Serrano, "Evaluation of a low-cost, solar-powered weather station for small-scale wind farm site selection," in *IEEE International Instrumentation and Measurement Technology Conference*, pp. 1-5, May 2018.
- **D. Aponte**, L. Benitez, E. Henao, and A. Espinoza, "Thermal Effects on Non-Rechargeable Li-ion Batteries due to Temperature Changes," in *LACCEI International Multi-Conference for Engineering, Education, and Technology*, pp. 1-6, July 2017.
- H. Calderon, R. Vasquez, **D. Aponte**, and M. Del Valle, "Successful Accreditation of the Electrical Engineering Program Offered in Two Campuses at CU," in *IEEE Frontiers in Education Conference*, pp. 1-6, October 2016.
- H. Calderon, R. Vasquez, **D. Aponte**, and M. Del Valle, "Successful Assessment Strategies for ABET Accreditation of Engineering Programs Offered at Different Campuses," in *LACCEI International Multi-Conference for Engineering, Education, and Technology*, pp. 1-6, July 2016.

WORK EXPERIENCE:

Universidad Ana G. Méndez, Gurabo Campus

Assistant Professor of the Electrical and Computer Engineering Department (Jan 2022 – present)

Instructor of the Electrical and Computer Engineering Department (Aug 2016 – Dec 2021)

Offered courses: Undergraduate Research, Power Electronics, Electronics II, Electronics II Laboratory, Electronics I, Electronics I Laboratory, Digital Electronics, Microprocessors Laboratory, Digital Logic Design I Laboratory, Electrical Networks Laboratory, Intermediate Programming.

Gardien Engineering LLC, Guaynabo

Co-Founder R&D Electrical Engineer (Aug 2020 – present)

- Head of Hardware Design and Sales Representative.
- Customer technical support and review and writing of proposals.

Momentum Creative Labs (MCL), Mayagüez

R&D Electrical Engineer (Dec 2013 – Jun 2020)

- Serves as electrical engineer consultant for MCL.
 - Supported Gardien Alert System on the generation and optimization of the electronic circuit design.

- Analysis, design, implementation and testing of software required by Gardien system.
- Generate technical documents for both company repository and customer.

Caribbean University, Bayamón Campus

Coordinator/Instructor of the Electrical Engineering Program (Feb 2014 – Jul 2016)

- Review/Define the EE program assessment plan.
- Create/Review class portfolios according with the assessment plan.
- Writing/Review of the EE self-study report to ABET accreditation.
- Advice EE students/ Planning EE courses offered.
- Recommend new faculty and budget for EE program according with needs. Offered courses: Electrical Engineering Capstone I and II, Power Electronics Applications & Design, Electrical Power Distribution Systems, Control Engineering, Communications Engineering, Microprocessors, Electromagnetics I, Electronics Engineering I and II, Logic Circuits I, Electrical Circuits Analysis I, Introduction to Computer Sciences.

Metropolitan University, Bayamón Campus

Adjunct professor of the Science and Technology Department (Jan 2009 – Dec 2015)

- Basic Mathematics, Intermediate Algebra, Quantitative Methods.
- Mathematics Specialist (Jan 2013 – Dec 2013)

Inter American University of Puerto Rico, Bayamón Campus

Research – PR CubeSat Project (summer 2011 – Dec 2013)

- Analysis, design, implementation and testing of electronic circuits.
- Project building and testing with a payload on the HASP platform of the LSU in 2011 and 2012, which reached an altitude of 36 km for a 17 hours flight at near space.

Adjunct professor of the Electrical and Computer Engineering Department (Jan 2009 – Dec 2013)

Offered courses: Capstone Design Project in Electrical Engineering, Control Systems, System Design Based on Microprocessors, Power Electronics, Electronic Design, Control of Automatic Process, Electromagnetism I, Electronics I and II, Fundamentals of Electronics and Instrumentation, Introduction to Computing Engineering, Instrumentation, Electronic Circuits I and II.

University of Puerto Rico, Mayagüez Campus

Research – Master Thesis (Aug 2006 – Jul 2008)

“Characterization of aluminum nitride thin films for Micro and Nano mechanical resonators”

- Setup of the physical vapor deposition by pulsed DC sputtering system for the deposition of aluminum nitride thin films.
- Characterization of samples using X-ray diffraction and atomic force microscope techniques.

SKILLS:

- Proficient in Multisim, PSpice, and LogicWorks, Matlab/Simulink, C, C++.
- Experience in Eagle CAD, Mathematica, Wolfram System Modeler.
- Experience in programming microcontrollers: Arduino, dsPIC33, PIC24.

PROFESSIONAL SERVICE:

- Reviewer for IEEE Transactions on Smart Grids, ASME Energy Sustainability, and LACCEI International Multi-Conference for Engineering, Education, and Technology.

PROFESSIONAL SOCIETIES:

Society of Hispanic Professional Engineer (SHPE), Institute of Electrical and Electronics Engineers (IEEE), American Society of Mechanical Engineers (ASME).