Curriculum Vitae

Personal Data:

Name	:	Luis A. Medina
Profession	:	Professor, University of Puerto Rico, Río Piedras
E-mail	:	`luis.medina17@upr.edu`

Education:

University of Puerto Rico, Humacao, Computational Math., B.S. June 2003.
Tulane University, Mathematics, Ph.D. May 2008.
Rutgers University, postdoctoral fellow, August 2008 - December 2009.

Appointments:

Assistant Dean of Research, University of Puerto Rico, Río Piedras, August 2023 - Present.
Professor, University of Puerto Rico, Río Piedras, July 2018- Present.
Associate Professor, University of Puerto Rico, Río Piedras, July 2014 - June 2018.
Assistant Professor, University of Puerto Rico, Río Piedras, January 2010 - June 2014.
Assistant Professor (post-doc), Rutgers University, August 2008 - December 2009.

Funding:

1. *Recursivity of Walsh-Hadamard Transformations of some Families of Boolean functions* (PI), FIPI, 2021-2023, $38,845.00 (completed).

2. *Center for Computarized Experimental Mathematics, Combinatorics and Information Theory* (PI), PR Sci. Trust, 2019-2021, $150,000.00 (completed).

3. *Computerized Pure Mathematics: Exponential Sums of Symmetric Boolean Functions* (PI), FIPI, 2014-2016, $36,130.00 (completed).

4. *Scholarship fund for excellence in Computer Science and Mathematics* (Co-PI) NSF DUE-135647, 2014-2019, $630,217.00 (completed).

Editorial Duties:

1. Associate Editor, Journal of Algebraic Combinatorics. February 2019 - Present.

Last five publications:

1. J. E. Calderón-Gómez, L. A. Medina and C. A. Molina-Salazar. Short k-rotation symmetric Boolean functions. *Discrete Applied Mathematics* 343 (2024) 49–64.

2. A. O. Gómez-Flores, L. A. Medina, L. Pomales and C. Santiago-Calderón. Recurrences in terms of special polynomials for exponential sums of elementary symmetric polynomials over finite fields. *INTEGERS* 23 (2023) #A11.

3. A. O. Gómez-Flores, L. A. Medina and P. Stanica. P-recursivity of some families of Boolean functions under biased Walsh transforms. *Rocky Mountain J. Math.* (2022) 1355-1373.

4. L. A. Medina, L. B. Sepúlveda and C. Serna-Rapello. Walsh-Hadamard transforms of generalized p-ary functions and C-finite sequences. *Discrete Appl. Math.* 315 (2022) 86–96.

5. L. A. Medina, M. G. Parker, C. Riera and P. Stanica. Root-Hadamard transforms and complementary sequences. To appear in *Cryptography and Communications*.

Five other publications:

1. L. A. Medina, L. B. Sepúlveda and C. Serna-Rapello. Value distribution of elementary symmetric polynomials and their perturbations over finite fields. *Finite Fields and Their Applications* 63(2) (2020) 101632.

2. F. Castro, L. A. Medina and L. B. Sepúlveda. Closed formulas for exponential sums of symmetric polynomials over Galois fields. *Journal of Algebraic Combinatorics* 50(1) (2019) 73–98.

3. F. Castro, R. Chapman, L. A. Medina and L. B. Sepúlveda. Recursions associated to trapezoid, symmetric and rotation symmetric functions over Galois fields. Discrete Mathematics 341(7) (2018) 1915–1931.

4. F. Castro, O. González and L. A. Medina. Diophantine equations with binomial coefficients and perturbations of symmetric Boolean functions. *IEEE Trans. Inf. Theory*, 64(2), 2018, 1347-1360.

5. F. Castro and L. A. Medina. Linear Recurrences and Asymptotic Behavior of Exponential Sums of Symmetric Boolean Functions. *Elec. J. Combinatorics*, 18(2) (2011), #P8.

Students:

PhD Students:

1. Rodrigo León. *Current.*

2. Eiver Rodríguez. *Current.*

3. José E. Calderón. Dissertation. *Characterization and affine equivalence of k-rotation symmetric Boolean functions*, May 2024 (expected).

4. Carlos Molina. Dissertation: *Generators of monomial rotation symmetric Boolean functions and a characterization of monomial dihedral symmetric Boolean functions*, June 2023.

5. César Serna Dissertation: *Value distribution of elementary symmetric polynomials and their perturbations over finite fields*, June 2020..

6. Leonid B. Sepúlveda. Dissertation: *Linear recursivity of exponential sums of symmetric functions over Galois Fields*, June 2018.

Masters Students:

1. Luisiany Pomales. Thesis: *Diophantine equations with binomial coefficients and perturbations of symmetric Boolean functions*, July 2022.

2. Juana Vásquez. Thesis: *Matrices de Hadamard y Sumas Exponenciales de Polinomios Simétricos Cuadráticos Sobre Cuerpos Finitos*, December 2018.

3. Stephany Nieves. Thesis: *Pisano Periods and Exponential Sums of Symmetric Boolean Functions*, February 2018.

Undergraduate Students:

Scholars in Residence 2020-2021

1. Carlos F. Santiago (August 2020 - May 2021)

Puerto Rico Louis Stokes AMP

1. Axel O. Gómez (August 2019 - Present)

Undergraduate research mentor

1. José P. Arbelo (Summer 2022- May 2023; now at U. Illinois, Urbana-Champaign)
2. Juliana Bonilla (January 2022 - May 2022; now at UPenn)
3. Ricardo López (January 2022 - April 2022)
4. Carlos F. Santiago (Aug 2021 - Dec 2021; sponsored by PRST; now at Columbia U.)
5. Axel O. Gómez (now at The Ohio State University, Columbus)
6. Oscar E. González (now at U. Illinois, Urbana-Champaign)
7. Stefanie Klajbor-Goderich (got her Ph.D. from U. Illinois, Urbana-Champaign)

Claude Shannon Scholarship

1. Axel O. Gómez (August 2018 - May 2019; now at The Ohio State University, Columbus).
2. María del C. Ramos (2017 - August 2018; now at UPR-Mayagüez)
3. Jasiel F. Rodríguez Acevedo (2017 - May 2018).
4. Luis Quiñones (August 2016 - May 2018; now Data Scientist at Banco Popular).
5. Raúl Negrón (2014 - March 2018; now works at the industry).
6. Samuel Pérez (2014 - 2015; got his Ph.D from U. of Notre Dame; now at Princeton U.)
7. José Pastrana (2014 - 2015; got his Ph.D from U. of Notre Dame; now at Northwestern)
8. Carlos Buxó (2015 - 2016; now at Michigan State University [Physics]).

Service to the University and/or Department (five):

1. Graduate Program Coordinator, Department of Mathematics, UPR-Río Piedras, Fall 2019-Present; Spring 2012-March 14, 2018.
2. College of Natural Science Graduate Assembly, UPR-Río Piedras, Fall 2019-Present; Spring 2012-March 14, 2018.
3. Interim Chairman of the Department of Mathematics, UPR-Río Piedras, March 14, 2018 - May 31, 2019.
4. Site Administrator of Mathematica License, UPR-Río Piedras, Spring 2015-Spring 2018.
5. Graduate Program Academic Adviser, UPR-Río Piedras, Spring 2012-March 14, 2018.

Teaching Experience:

1. Modern Algebra 2 [Graduate] (UPR-Río Piedras)
2. Modern Algebra 1 [Graduate] (UPR-Río Piedras)
3. Linear Algebra [Graduate] (UPR-Río Piedras)
4. Graduate Seminar [Graduate] (UPR-Río Piedras)
5. Theory of Numbers (UPR-Río Piedras, Rutgers University)
6. Experimental Mathematics (UPR-Río Piedras)
7. Abstract Algebra 2 (UPR-Río Piedras)
8. Abstract Algebra (UPR-Río Piedras)
9. Advanced Calculus (UPR-Río Piedras, Rutgers University)
10. Linear Algebra [Undergraduate] (UPR-Río Piedras)
11. Intro. Discrete Mathematics (UPR-Río Piedras)
12. Intro. Linear Algebra (Rutgers University)
13. Inmersión Program (UPR-Río Piedras)
14. Calculus 2 (Rutgers University, Tulane University)
15. Calculus 1 (UPR-Río Piedras, Rutgers University, Tulane University)
16. Pre-Calculus 2 (UPR-Río Piedras)
17. Undergraduate Seminar (UPR-Río Piedras)

Professional Memberships:

1. American Mathematical Society

Languages:

1. Spanish
2. English