



Andrés Esteban Merino Toapanta

Mathematician
Full professor

- October 18, 1990
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- Ecuadorian

Online Profiles



Languages

Español	● ● ● ● ●
English	● ● ● ● ●
Française	● ● ● ● ●

Areas of Interest

- Descriptive Set Theory
- Foundations of Mathematics
- Data Science
- Machine Learning
- Editing and Composition in \LaTeX
- Mathematics Education

Education

feb-2024	Master's Degree in Data Science	Universitat Oberta de Catalunya
Thesis: Automatic Image Recognition for Plant-Pollinator Network Reconstruction		
mar-2017	Master's Degree in Pure and Applied Mathematics	Universidad Central del Ecuador
Thesis: Classification of Countable Compact Subsets in some Polish Spaces		
oct-2014	Master 1	Université Jean Monnet
Master Mathématiques 1		
oct-2014	Mathematician	Escuela Politécnica Nacional
Thesis: Classification of Countable Compact Subsets of the Reals		
<i>Summa Cum Laude</i>		
High		
jul-2008	School Diploma	Colegio Municipal Experimental "Sebastián de Benalcázar"
Specialization in Physics and Mathematics		

Teaching Experience

apr-2017	Full Professor	Pontificia Universidad Católica del Ecuador
Mathematics Professor in the Faculty of Exact and Natural Sciences (current full-time job: 7 years)		
apr-2021	Postgraduate Lecturer	Pontificia Universidad Católica del Ecuador
Lecturer in the Master's Degree in Experimental Sciences Education, major in Mathematics and Physics (part-time: 1 year and 6 months)		
mar-2018	Lecturer	Escuela Politécnica Nacional
Mathematics Professor in the Department of Basic Education (half-time: 12 months)		
oct-2014	Adjunct Professor	Escuela Politécnica Nacional
Mathematics Professor in the Faculty of Sciences (2 years and 5 months)		
apr-2014	Teacher	Colegio Municipal "Sebastián de Benalcazár"
Mathematics Teacher (4 months)		

Professional Experience (Non-teaching)

apr-2021	Postgraduate Coordinator	Universidad Central del Ecuador
Coordinator of the Master's Degree in Pure and Applied Mathematics in the Faculty of Sciences (part-time: 1 year and 9 months)		
jun-2019	Editor	Ministerio de Educación
Editor of Mathematics modules for the 10th year of Basic General Education in the National Curriculum Directorate (1 month)		
feb-2018	Validator	Instituto Nacional de Evaluación Educativa (INEVAL)
Validation of item production 2018 in the Item Production and Safeguarding Directorate (2 months)		
may-2015	Monitor	Instituto de Altos Estudios Nacionales (IAEN)
Monitor of the virtual Mathematics course in the Continuing Education Center (CEC-EP) (1 month)		

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About Me

I have dedicated my career to teaching and research. In the latter, I collaborate in the areas of Descriptive Set Theory, Foundations of Mathematics, Mathematics Education, and Data Science. I have contributed knowledge and advancements through publications in scientific journals and participation in national and international conferences. My contributions include studies on the Cantor-Bendixson Derivative, Machine Learning models for data and image analysis, and innovative techniques for teaching Mathematics.

Software



oct-2012	Laboratory Assistant	Escuela Politécnica Nacional
	Support in the seed research project "Flow over granular assemblies" (1 year)	
dec-2011	Editing Assistant	Abya Yala, Revista La Granja
	Layout, diagramming, and template design (3 years)	
mar-2011	Laboratory Assistant	Escuela Politécnica Nacional
	Editing in L ^A T _E X and support in classes of Single Variable Calculus and Foundations of Mathematics (1 year and 3 months)	
aug-2010	Editing Assistant	Escuela Politécnica Nacional
	Editing and publication of books and journals in the Faculty of Sciences Publications Unit (6 months)	
nov-2010	Editing Assistant	Analítica, revista de análisis estadístico
	Editing, diagramming, and layout. (3 years)	

Appointments

mar-2025	Head of the Service Unit for Curriculum Development and Innovation	
	<i>Pontificia Universidad Católica del Ecuador, Faculty of Exact, Natural and Environmental Sciences</i>	
	Current appointment	
jul-2023	Coordinator of the School of Physical and Mathematical Sciences	
	<i>Pontificia Universidad Católica del Ecuador, Faculty of Exact and Natural Sciences, School of Physical and Mathematical Sciences</i>	
	1 year and 8 months	
mar-2020	Coordinator of Virtual Classrooms	
	<i>Pontificia Universidad Católica del Ecuador, Faculty of Exact and Natural Sciences, School of Physical and Mathematical Sciences</i>	
	3 years	
apr-2021	Coordinator of the Master's Degree in Pure and Applied Mathematics	
	<i>Universidad Central del Ecuador, Faculty of Sciences</i>	
	1 year and 9 months	
sep-2018	Coordinator of the Vector Calculus Course	
	<i>Escuela Politécnica Nacional, Department of Basic Education</i>	
	6 months	
sep-2018	Coordinator of the Linear Algebra Course	
	<i>Escuela Politécnica Nacional, Department of Basic Education</i>	
	6 months	

University Courses Taught

- Machine learning
- Single Variable Calculus
- Vector Calculus
- Mathematical Analysis
- Mathematical Logic and Set Theory
- Real Analysis
- Foundations of Mathematics
- Ordinary Differential Equations
- Linear Algebra
- Fuzzy Logic
- Discrete Mathematics
- Mathematics for Graphic Design

Courses and Conferences Delivered (last 5 years)

nov-2025	Presentation: Exploring the Didactic Potential of ChatGPT Hallucinations in Teaching <i>VII Congreso Internacional de Tecnología y Educación - TEDUCA 2025</i> Universidad de Santander
jun-2025	Conference: Exploring the Didactic Potential of ChatGPT Hallucinations in Teaching <i>Workshop Internacional INCOIN LEARNING: Inteligencia Artificial aplicada a la Educación Superior, edición PUCE 2025</i> Pontificia Universidad Católica del Ecuador
aug-2024	Conference: Integrating ChatGPT into the Flipped Classroom Methodology <i>Workshop INCOIN: Inteligencia Artificial en la Educación Superior, edición PUCE 2024</i> Pontificia Universidad Católica del Ecuador
feb-2024	Presentation: Use of ChatGPT for Teaching Differential Calculus <i>MEM 2024</i> Universidad Antonio Nariño
oct-2023	Presentation: Does ChatGPT Know How to Derive? An Experience in the Classroom <i>STEM Miami 2023 Seminar</i> Broward International University
aug-2023	Minicourse: Reinforcement Learning <i>Summer School in Machine Learning 2023</i> Pontificia Universidad Católica del Ecuador (6 hours)
jul-2023	Panel: Coordinators of Undergraduate and Postgraduate Programs in Data Science <i>I Meeting on Big Data and Artificial Intelligence Methods and Tools Applied to the Study of Social Phenomena in Ecuador</i> Flacso Ecuador
sep-2022	Presentation: Activity Guide for Mathematics Reinforcement Based on Gamification Directed at Upper Basic Level <i>II International Education Congress: Crisis, Creativity, and Educational Transformation</i> Pontificia Universidad Católica del Ecuador
feb-2022	Workshop: Innovative Didactics for Teaching and Learning Mathematics La Salle, Distrito Lasllista Norandino (30 hours)
nov-2021	Video Presentation: Designing Fonts through Bézier Curves and GeoGebra <i>VIII International Workshop "Trends in Mathematics Education Based on Research in Alliance with the GeoGebra Latin American Community"</i> Benemérita Universidad Autónoma de Puebla
sep- 2021	Course: Intermediate Level GeoGebra Software Management Universidad Regional Amazónica Ikiam (10 hours)
dec-2020	Conference: A Generalization of the Cantor Ternary Set <i>II Ecuadorian Mathematics Days</i> Universidad Universidad Técnica de Manabí
dec-2020	Conference: Equivalence of the Axiom of Choice with the Function Redefinition Problem <i>II Ecuadorian Mathematics Days</i> Universidad Universidad Técnica de Manabí
dec-2020	Conference: Ruled Surfaces in GeoGebra as a Link between Mathematics and Architecture <i>II Ecuadorian GeoGebra Day</i> Universidad Nacional de Educación

Conferences Attended (last 5 years)

nov-2025	VII Congreso Iternacional de Tecnología y Educación - TEDUCA 2025 <i>Universidad de Santander</i> Santa Marta–Colombia (16 hours)
aug-2024	INCOIN Workshop: Artificial Intelligence in Higher Education, PUCE 2024 edition <i>Pontificia Universidad Católica del Ecuador</i> Quito–Ecuador (18 hours)
oct-2023	STEM Miami Seminar 2023 <i>Broward International University</i> Miami–United States (8 hours)
sep-2022	II International Education Congress: Crisis, Creativity, and Educational Transformation <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (40 hours)
jun-2022	I International Symposium on Physics and Mathematics <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (10 hours)
feb-2022	XII Symposium on Mathematics and Mathematics Education, XI International Congress on Mathematics Assisted by Computer (MEM2022) <i>Universidad Antonio Nariño</i> Bogotá-Colombia (20 hours)
jan-2022	Applied Data Science Research Congress – II National Congress of R Users Group <i>Escuela Politécnica Nacional</i> Quito-Ecuador (34 hours)
nov-2021	VIII International Workshop "Trends in Mathematics Education Based on Research in Alliance with the GeoGebra Latin American Community" <i>Benemérita Universidad Autónoma de Puebla</i> Puebla-Mexico (10 hours)

Teacher Training Courses (last 5 years)

jul-2025	Challenge-Based Learning <i>Tecnológico de Monterrey</i> Monterrey–México (26 hours)
sep-2025	Diploma in University Teaching <i>Pontificia Universidad Católica del Ecuador</i> Quito–Ecuador (140 hours)
feb-2025	Advanced Exploration of Moodle Tools <i>Pontificia Universidad Católica del Ecuador</i> Quito–Ecuador (40 hours)
jan-2025	Designing AI-Mediated Learning Experiences <i>Tecnológico de Monterrey</i> Monterrey–México (24 hours)
feb-2024	AI to Improve the Teaching and Learning Process <i>IDEA-USFQ</i> Quito–Ecuador (6 hours)
jul-2023	Artificial Intelligence Applied to Education <i>Universidad Israel</i> Quito–Ecuador (80 hours)

jul-2022	PUCE INNOVA: Towards a University Pedagogical Transformation <i>Reimagine Education</i> Barcelona-Spain (16 hours)
dec-2021	Concept and Development of a Prototype for Educational Transformation Using the RIEDUSIS Methodology <i>Reimagine Education</i> Barcelona-Spain (65 hours)
oct-2021	Certification in Neuroscience and Education Applied to Teaching <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (50 hours)
apr-2021	Creating Self-Evaluative Activities with GeoGebra <i>Instituto GeoGebra Extremeño</i> Mérida-Spain (30 hours)
feb-2021	Advanced Course for Virtual Classroom Management <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (24 hours)

Other Training Courses (last 5 years)

nov-2025	Agentic AI <i>Actumlogos</i> Mexico (36 hours)
sep-2025	Digital Image Processing with Python and OpenCV <i>umaker</i> Perú (40 hours)
mar-2025	Introduction to Reinforcement Learning <i>CEDIA</i> Cuenca-Ecuador (40 hours)
feb-2025	Efficient Academy Writer with AI <i>Sociedad Ecuatoriana de Estadística</i> Quito-Ecuador (20 hours)
feb-2025	General Information Security Policy <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (20 hours)
nov-2024	Elements of AI <i>University of Helsinki</i> (50 hours)
nov-2024	Gender-Based Violence Prevention <i>Pontificia Universidad Católica del Ecuador</i> Quito-Ecuador (20 hours)
nov-2022	Amazon Web Service for Data Science <i>SDC Learning</i> Lima-Peru (64 hours)
mar-2021	Machine Learning with Python <i>Universidad Peruana Cayetano Heredia</i> Lima-Peru (32 hours)

Publications

- dec-2023 **Scientific Article**
*Merino, A. and Heredia, S. (2023). Relationship of the Cantor-Bendixson Derivative with Set Algebra. *Selecciones Matemáticas*, 10(2), 339-351.*
<https://doi.org/10.17268/sel.mat.2023.02.10>
Area: Descriptive Set Theory
- jan-2023 **Scientific Article**
*Jiménez, S. and Merino, A. (2023). Machine Learning Models Based on CRISP-DM for the Analysis of Depression Levels in Students of the Escuela Politécnica Nacional. *Latin-American Journal of Computing*, 10(1), 22-43.*
<https://lajc.epn.edu.ec/index.php/LAJC/article/view/335>
Area: Data Science
- aug-2022 **Scientific Article**
*Merino, A., Cueva, M., Sarmiento, M., and Paredes, A. (2022). Analysis of the Concepts of Variable and Constant in Students of the Unified General Baccalaureate of Ecuador. *593 Digital Publisher CEIT*, 7(4-2), 175-185.*
<https://doi.org/10.33386/593dp.2022.4-2.970>
Area: Mathematics Education
- jun-2021 **Scientific Article**
*Merino, A. and Ortiz-Castro, J. (2021). Continuity of Functions Based on Rearrangements of β -Expansions of a Number. *Digital Journal of Mathematics, Education, and Internet*, 22(1).*
<https://doi.org/10.18845/rdmei.v22i1.5758>
Area: Real Analysis
- feb-2021 **Scientific Article**
*Álvarez-Samaniego, B. and Merino, A. (2021). Some Properties Related to the Cantor-Bendixson Derivative on a Polish Space. *New Zealand Journal of Mathematics*, 50, 207-218.*
<http://dx.doi.org/10.17268/sel.mat.2020.02.04>
Area: Descriptive Set Theory
- dec-2020 **Scientific Article**
*Merino, A. and Heredia, S. (2020). A Generalization of the Cantor Ternary Set. *Selecciones Matemáticas*, 7(2), 222-233.*
<http://dx.doi.org/10.17268/sel.mat.2020.02.04>
Area: Real Analysis
- may-2020 **Scientific Article**
*Merino, A. and Trujillo, J. C. (2020). Equivalence of the Axiom of Choice with the Function Redefinition Problem. *Revista Politécnica*, 45(2), 51-56.*
<https://doi.org/10.33333/rp.vol45n2.05>
Area: Foundations of Mathematics
- nov-2019 **Scientific Article**
*Álvarez-Samaniego, B. and Merino, A. (2019). Countable Ordinal Spaces and Compact Countable Subsets of a Metric Space. *Australian Journal of Mathematical Analysis and Applications*, 16(2), article 12.*
Area: Descriptive Set Theory
- jun-2019 **Scientific Article**
*Ortiz, J. and Merino, A. (2019). Schematic Representation of the Set Classification Problem. The Classification of the Quadratic Equation of Two Variables. *Mathematics ESPOL-FCNM JOURNAL*, 17(1), 1-14.*
Area: Mathematics Education

sep-2016	Scientific Article Álvarez-Samaniego, B. and Merino, A. (2019). <i>A Primitive Associated to the Cantor-Bendixson Derivative on the Real Line</i> . <i>Journal of Mathematical Sciences: Advances and Applications</i> 41 (1). http://dx.doi.org/10.18642/jmsaa_7100121692 Area: Descriptive Set Theory
junio 2012	Booklet Merino, A., Cueva, E. and Trujillo J.C. (2012). <i>Single Variable Calculus: Summary and Solved Exercises</i> . Publications Unit of the Faculty of Sciences. Area: Mathematics Education

Awards and Scholarships

Feb-2025	Recognition for High Performance in Teaching Practice Facultad de Ciencias Exactas, Naturales y Ambientales – PUCE
dec-2023	Gratitude Button Asociación de Profesores de la Pontificia Universidad Católica del Ecuador
Jul-2021	UOC Scholarship for Outstanding Students from Ecuador Universitat Oberta de Catalunya
dec-2017	Municipal Award Pedro Vicente Maldonado for the Best Published Work in the Area of Exact Sciences in 2017 Municipio del Distrito Metropolitano de Quito Work: A Primitive Associated to the Cantor Bendixson Derivative on the Real Line