

A. HAYDEÉ CONTRERAS PERUYERO

Postdoctoral fellowship at Center of Sciences Mathematics - UNAM |
Topological and Geometric Data Analysis | Bioinformatics | Geometric Group
Theory | Global Riemannian Geometry | Quantum Geometry and Topology



EDUCATION

2021
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2016

Ph. D. in Science in Mathematics

Instituto de Matemáticas, UNAM

Mexico City, Mexico

- Dr. Pablo Suárez Serrato
- Thesis: Rigidez Cuasi-Isométrica en Variedades de Gráficas Superiores

2021
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2020

Specialty in Applied Statistics

Instituto de Investigaciones en Matemáticas Aplicadas y en
Sistemas

Mexico City, Mexico

- Grade: 9.25/10.

2016
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2014

Master of Science in Mathematics

Instituto de Matemáticas, UNAM

Mexico City, Mexico

- Dr. Pablo Suárez Serrato
- Thesis: Sobre la geometría y la topología de las variedades de gráficas
- Grade: 9.67/10.

2012
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2007

Bachelor's Degree in Mathematics

Universidad Veracruzana

Veracruz, Mexico

- Dr. Jorge Luis López López
- Thesis: Triangulaciones de 3-variedades hiperbólicas que fibran sobre el círculo con fibra el toro con un agujero
- Grade: 9.4/10.



APPOINTMENTS

current
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2024

Postdoctoral research DGAPA UNAM 2024

Centro de Ciencias Matemáticas, UNAM

Michoacan, Mexico

- Dr. Daniel Juan Pineda, Dra. Nelly Sélem Mojica, Dr. Jesús Hernández Hernández
- Aplicaciones de análisis topológico de datos e invariantes de cuasi-isometrías

The source code is available at
[HaydeePeruyero/CV](#)

The extended version of my CV can
be found in this link [Extended CV](#)

Last updated on 2024-10-02.

2024

2024 Summer Collaborators IAS

Institute of Advances Studies

📍 Princeton, USA

- Catherine Searle, Megan Kerr, Regina Rotman, Erin Griffin, Isabel Beach
- Existence Criteria for Compact Homogeneous Einstein Metrics

2024
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2023

Postdoctoral research DGAPA UNAM 2023

Centro de Ciencias Matemáticas, UNAM

📍 Michoacan, Mexico

- Dr. Daniel Juan Pineda, Dra. Nelly Sélem Mojica, Dr. Jesús Hernández Hernández
- TDA y Machine learning aplicado a Metagenómica e invariantes de Variedades de Gráficas

2023
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2022

Postdoctoral research CONACyT Ciencia de Frontera 217392

Centro de Ciencias Matemáticas, UNAM

📍 Michoacan, Mexico

- Dr. Jesús Hernández Hernández
- Propiedades invariantes de Variedades de Gráficas Superiores

2022
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2021

Head of the Department of Basic Sciences

Instituto Tecnológico de Martínez de la Torre

📍 Veracruz, Mexico



PUBLICATIONS(SELECTED)

2024

Actinobacteria bioprospecting from ore-forming environments

- Aguilar, C., Alwali, A., Mair, M., Rodriguez-Orduña, L., Contreras-Peruyero, H., Modi, R., Sélem-Mojica, N., Licona-Cassani, C. & Parkinson, E. I. Actinomycetota bioprospecting from ore-forming environments. *Microbial Genomics*, 10(5), 001253. ISSN 2057-5858, <https://doi.org/10.1099/mgen.0.001253>

2024

Physicochemical Properties of Two Mexican Stingless Bee Honeys to Strengthen Their Biocultural Value

- Xolalpa-Aroche, A., Hernández-Mena, D. I., Moguel-Chin, W. I., Contreras-Peruyero, H., Rivero-Cruz, B. E., Ortiz-Vázquez, E., & Delgado-Suárez, E. J. (2024). Physicochemical Properties of Two Mexican Stingless Bee Honeys to Strengthen Their Biocultural Value. *Revista Brasileira de Farmacognosia*, 1-11. <https://doi.org/10.1007/s43450-024-00566-z>

2024

Multidisciplinary Workshop on Pangenomics and Topological Data Analysis

- H. Contreras Peruyero, S. Guerrero-Flores, C. Zirión-Martínez, P. M. Mejía-Ponce, Marisol Navarro-Miranda, J. Abel Lovaco-Flores, J.M. Ibarra-Rodríguez, A. Pashkov, C. Licona-Cassani and N. Sélem-Mojica. *Bioinformatics Advances*, 2024; vbae139 <https://doi.org/10.1093/bioadv/vbae139>

PREPRINTS(SELECTED)

2024

CAMDA 2023: finding patterns in urban microbiomes

- Haydeé Contreras-Peruyero , Imanol Nuñez-Morales , Mirna Vázquez-Rosas-Landa , Daniel Santana-Quinteros , Antón Pashkov , Mario E. Carranza-Barragán , Rafael Perez-Estrada , Shaday Guerrero-Flores , Eugenio Balanzario , Víctor Muñiz-Sánchez , Miguel Nakamura-Savoy , Leticia L. Ramírez-Ramírez and Nelly Selem-Mojica. Submitted June 2024

2024

Topological data analysis captures Horizontal Gene Transfer in Antimicrobial Resistance gene families among clinically relevant bacteria

- Shaday Guerrero-Flores , Haydeé Contreras-Peruyero, Jose Ibarra , Jose Abel Lovaco-Flores , Francisco Nieto , Fernando Fontove-Herrera and Nelly Selem-Mojica. Submitted July 2024

2024

Fractal dimensions of complex networks: advocating for a topological approach

- Rayna Andreeva, Haydeé Contreras-Peruyero, Sanjukta Krishnagopal, Nina Otter, Maria Antonietta Pascali, Elizabeth Thompson. Submitted August 2024

TEACHING EXPERIENCE (SELECTED)

2024

Advanced Statistics Course: Machine Learning and Deep Geometric Learning

Centro de Ciencias Matemáticas, UNAM

 Michoacan, Mexico

- Graduate Course
- <https://github.com/CursosPosgradoCCM/ML-GDL>

2024

Scientific Computing: Scientific computing for data analysis

Centro de Ciencias Matemáticas, UNAM

 Michoacan, Mexico

- Graduate Course
- https://haydeeperuyero.github.io/Computo_Cientifico/

2024

Web pages with Rmarkdown and Github

Centro de Ciencias Matematicas (CCM), UNAM

 Morelia, Mexico

- Encuentro de R-Ladies Morelia y R-Ladies Querétaro
- <https://r-ladies-morelia.github.io/project/webpage/>

2024	Data analysis - PYTHON, BASH Y GIT Centro de Ciencias Matematicas (CCM), UNAM	📍 Morelia, Mexico
	<ul style="list-style-type: none"> Instructors: Haydeé Peruyero(Git), Shaday Guerrero (Bash), Miguel Magaña(Python), Software Carpentry Workshop https://miguel-mx.github.io/2024-01-24-ccm-unam-swc/ 	
2024	Taller de Metagenómica TecNM Campus Chiná	📍 Virtual
	<ul style="list-style-type: none"> Instructors: Haydeé Peruyero(R and Metagenomics), Shaday Guerrero (Bash), Nelly Sélem(Metagenomics) https://haydeeperuyero.github.io/2024-08-26-metagenomics-workshop-online/ 	
2023	Topology advanced course: Applications of Topological Data Analysis Centro de Ciencias Matemáticas, UNAM	📍 Michoacan, Mexico
	<ul style="list-style-type: none"> Graduate Course https://github.com/HaydeePeruyero/CursoA_Aplicaciones_TDA 	
2023	Statistics seminar: Data Analysis with R Centro de Ciencias Matemáticas, UNAM	📍 Michoacan, Mexico
	<ul style="list-style-type: none"> Graduate Course https://haydeeperuyero.github.io/Seminario_Estadistica/ 	
2023	Presentations with Markdown: Xaringan and Quarto revealjs Centro de Ciencias Matematicas (CCM), UNAM	📍 Virtual event
	<ul style="list-style-type: none"> R-ladies Morelia https://r-ladies-morelia.github.io/Xaringan_RLadies2023/ 	
2022	dplyr y Rmarkdown con Latex Centro de Ciencias Matematicas (CCM), UNAM	📍 Virtual event
	<ul style="list-style-type: none"> R-ladies Morelia 	
2022	R for Reproducible Scientific Analysis Centro de Ciencias Matematicas (CCM), UNAM	📍 Virtual event
	<ul style="list-style-type: none"> Helper for R-ladies Morelia 	
2021	Teaching Assistant, Analytic Geometry II Facultad de Ciencias, UNAM	📍 Mexico City, Mexico
	<ul style="list-style-type: none"> Professor José Crispín Ruiz Pantaleón https://github.com/appliedgeometry/Geometria-Analitica 	
2020	Teaching Assistant, Analytic Geometry II Facultad de Ciencias, UNAM	📍 Mexico City, Mexico
	<ul style="list-style-type: none"> Professor José Crispín Ruiz Pantaleón https://github.com/appliedgeometry/Geometria-Analitica 	

2020	Teaching Assistant, Differential and Integral Calculus II Facultad de Ciencias, UNAM	📍 Mexico City, Mexico
	• Professor Oscar A. Garrido and Arturo Sánchez	
2020	Teaching Assistant, Analytic Geometry II Facultad de Ciencias, UNAM	📍 Mexico City, Mexico
	• Professor Pablo Suárez Serrato • https://github.com/appliedgeometry/Geometria-Analitica	
2019	Teaching Assistant, Analytic Geometry I Facultad de Ciencias, UNAM	📍 Mexico City, Mexico
	• Professor Pablo Suárez Serrato • https://github.com/appliedgeometry/Geometria-Analitica	

🗣 TALKS AND POSTERS (SELECTED)

2024	XIX Seminario de Matemáticas Aplicadas UATx Talk	📍 Tlaxcala, Mexico
	• Análisis Topológico de Datos aplicado a la transferencia horizontal de genes de resistencia antimicrobiana • Co-authors: Shaday Guerrero-Flores, Nelly Sélem-Mojica. UATx Apizaco, Tlaxcala, September 23th	
2024	Escuela de Matemáticas de América Latina y el Caribe Cuernavaca 2024 Talk	📍 Morelos, Mexico
	• Analizando datos con topología y geometría • Co-authors: Shaday Guerrero-Flores, Nelly Sélem-Mojica. IMATE Cuernavaca, June 18th	
2023	XXIV Escuela de Otoño (EOBM) y el XVII Encuentro Nacional (ENBM), of Bio-mathematics Minicourse	📍 Veracruz, Mexico
	• Aplicaciones de análisis topológico de datos a Pangenómica • October 9 - 14	
2023	Taller Propedéutico de Ingreso al PCCM 2023 Talk	📍 Michoacan, Mexico
	• Algunas aplicaciones relacionadas al análisis topológico de datos y aprendizaje geométrico profundo • October 9th	

2023

31st Conference on Intelligent Systems for Molecular Biology and 22th European Conference On Computational Biology as part of the Annual International Conference on Critical Assessment of Massive Data Analysis

Poster

📍 Lyon, France

- Topology, regression and metapangenome enrich conventional microbiome analyses
- July 24 - 27

2023

Décima Jornada de Geometría, Topología y Dinámica

Talk

📍 Michoacan, Mexico

- Algunos problemas relacionados al análisis topológico de datos y aprendizaje geométrico
- CCM, UNAM, June 16th,

2022

Seminario FISMAT

Talk

📍 Michoacan, Mexico

- Algunos problemas relacionados al análisis topológico de datos y aprendizaje geométrico
- Facultad de Ciencias Físico Matemáticas de la Universidad Michoacana de San Nicolás de Hidalgo, November 15th

2022

8th Mexican Workshop on Applied Geometry and Topology

Poster

📍 Virtual

- Topological and Geometric explorations of Autism fMRI connectomes
- Co-authors:Sebastian Pujalte Ojeda (Instituto de Fisiología Celular UNAM), Sophie Achard (Centre de recherche Inria Grenoble Rhône-Alpes), Pablo Suárez Serrato (Instituto de Matemáticas UNAM), November 10th

2022

ISCB-Latin America SoIBio BioNetMX Conference on Bioinformatics

2022

Poster

📍 Queretaro, Mexico

- Topological data analysis applied to metagenomics and pangenomics data of Clavibacter
- Co-authors: Shaday Guerrero Flores (Centro de Ciencias Matemáticas-CIMAT), Nelly Selem Mojica (Centro de Ciencias Matemáticas), Noé Bárcenas Torres (Centro de Ciencias Matemáticas), Jesús Hernández Hernández (Centro de Ciencias matemáticas), Antonio Rieser (CIMAT), November 3rd



SCIENCE COMMUNICATION (SELECTED)

current

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2023

Club Mate

Workshop

📍 Michoacan, Mexico

- Participation in the mate club aimed at elementary and secondary school students
- CCM UNAM

2024	Feria Infantil y Juvenil de Ciencias y Artes	 Michoacan, Mexico
	Workshop	
	<ul style="list-style-type: none"> • Estereogramas • May 25th 	
2024	Feria de las Matemáticas, March 16th	 Michoacan, Mexico
	<ul style="list-style-type: none"> • Taller de Papiroflexia Modular • Mesa Redonda: ¿Qué hacemos cuentas? Son puros cuentos 	
2023	PI Day in the Instituto Tecnológico Superior de Martínez de la Torre, March 14th	 Veracruz, Mexico
	Talk	
	<ul style="list-style-type: none"> • Algunas aplicaciones relacionadas al análisis topológico de datos y aprendizaje geométrico • ITSMT, Mtz. de la Torre. 	
2023	11º Fiesta de las Ciencias y Humanidades	 Michoacan, Mexico
	Workshop	
	<ul style="list-style-type: none"> • Lengua de Señas Mexicana (LSM) y Matemáticas, October 19th • Biomatemáticas, October 20th • UNAM Campus Morelia 	
2022	10º Fiesta de las Ciencias y Humanidades	 Michoacan, Mexico
	Workshop	
	<ul style="list-style-type: none"> • Lengua de Señas Mexicana (LSM) y Matemáticas, October 27th - 28th • UNAM Campus Morelia 	

RESEARCH EXPERIENCE (SELECTED)

2023	Women in Computational Topology	 Lausanne, Switzerland
	Bernoulli Center EPFL	
	<ul style="list-style-type: none"> • Studying self-similarity of complex networks with persistent magnitude • Nina Otter, Maria Antonietta Pascali, Sanjukta Krishnagopal, Rayna Andreeva, Elizabeth Thompson. July 17 - July 21 	

AWARDS

2023	1st place at the Annual International Conference on Critical Assessment of Massive Data Analysis	 Lyon, France
	ISCB	
	<ul style="list-style-type: none"> • Anti-Microbial Resistance Prediction and Forensics in urban metagenomes • July 2023 	

2022

Mentee in the Mentoring in Action - Women and Girls in STEM

Online programme

British Council, Inova Consultancy, WITEC

📍 Mexico

- Humiko Yahaira Hernández Acosta

- April - June 2022

2022

2nd place at the ISCB-La SOLBIO BIONETMX WIKIPEDIA

COMPETITION

ISCB

📍 Queretaro, Mexico

- Matrices de distancias

- October, 2022



SYNERGISTIC ACTIVITIES (SELECTED)

current

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2022

R Ladies Morelia

📍 Michoacán, Mexico and hybrid

- Co-organizer of the sessions of R Ladies Morelia <https://r-ladies-morelia.github.io/> https://www.meetup.com/es-ES/r-ladies-morelia/?eventOrigin=home_groups_you_organize
- CCM UNAM

2024

Primer Encuentro de Mujeres en Topología, Geometría y sus Aplicaciones

📍 Michoacán, Mexico

- Co-organizer with Sandy Aguilar, Yesenia Villicaña Molina, Ferrán Valdez Webpage: <https://www.matmor.unam.mx/encuentro-mujeres-topogeo/>
- CCM UNAM, September 11th - 13th

2023

Encuentro Nacional de R ladies México

📍 Virtual

- Co-organizer of Encuentro Nacional de R ladies México
- September 23

2023

Hackaton Reto Critical Assessment of Massive Data (CAMDA)

📍 Michoacan, Mexico

- Co-organizer of Hackaton Reto Critical Assessment of Massive Data (CAMDA) de geolocalización de datos de microbioma
- CCM UNAM, June 3rd - 7th

2022

Hackaton TDA

📍 Michoacan, Mexico

- Co-organizer of the hackaton Análisis Topológico de Datos en el Hackaton Aplicaciones de Matemáticas en problemas de datos biológicos
- CCM UNAM, November