Bolívar **Aponte Rolón**

Grinell. Iowa 50112

bolaponte@pm.me | ★www.bolaponte.com | ☑jibarozzo | ☑bolivar-aponte | ⑩ 0000-0002-2544-4551

Summary_

Scientist with deep experience in statistical analyses in R and Python (e.g., predictive models, machine learning and clustering techniques) on genomic and environmental data. Experienced in delivering high-quality data-driven reporting tools to inform research decision making. Strong leadership and project management skills; fostering inclusive and collaborative environments. Interested in developing reproducible data analysis workflows, software development, novel solutions, and learning new technologies and tools. Committed to higher education teaching and mentoring.

Education

Doctor of Philosophy New Orleans, LA

TULANE UNIVERSITY, DEPARTMENT OF ECOLOGY AND BIOLOGY

2018 - 2024

• "Foliar Endophytes and Leaf Traits: Insights from Tropical Trees and Monkeyflowers". Sunshine Van Bael, Ph.D. (advisor), Kathleen Ferris, Ph.D. (co-advisor)

Master of Science Ann Arbor, MI

University of Michigan - Ann Arbor, School for the Environment and **SUSTAINABILITY**

Bachelor of Arts San Juan, Puerto Rico

University of Puerto Rico - Rio Piedras



C Technical

Effective communication, Decision-Making, Critical thinking, Team collaboration, Leadership

Problem-solving, Adaptability

Mentoring, Cross-functional collaboration, Team-building, Conflict resolution, **Interpersonal Skills**

Stakeholder communication

R, Python, Bash, Rust, SQL, LaTex, Markdown **Programming/Interface**

Data/Web Reporting Quarto, Shiny

OS/Shell Experience Linux, PowerShell, WSL

Cloud Computing CentOS 7 HPC

Data Wrangling and tidyverse, qqplot2, Tableau

Visualization

Version Control Git and GitHub

Bioinformatic Tools GATK, samtools, cutadapt, Trimmomatic, phyloseq and microeco

A⊠ Languages ___



Department of Agricultural and Biosystems Engineering

POST - DOCTORAL RESEARCH ASSOCIATE (DATA SCIENTIST - BIOINFORMATICIAN)

Iowa State University, Ames, IA

January 2025 - Present

- Developed high-throughput, reproducible pipelines for large-scale microbiome analysis, enabling robust identification of core and non-core microbial communities across multiple Bioenergy Research Centers (BRCs) using R, parallel computing, and highperformance cluster resources.
- Author and maintainer of the "BRCore" R package. Implemented novel methods for core microbiome extraction based on Bray-Curtis dissimilarity and abundance-occupancy modeling, now a foundational tool within the Inter-BRC Microbiome project.
- Enabled cross-center, cross-crop comparative analyses by standardizing data processing, quality control, and statistical workflows, directly supporting multi-institutional collaboration and increasing analytical consistency.
- Produced publication-ready visualizations and summary statistics that revealed robust patterns of core microbial taxa and their ecological drivers, informing both experimental design and biological interpretation within the BRC network.
- Demonstrated the ecological significance of core taxa, quantifying their contribution to community dissimilarity and highlighting assembly processes in plant-microbe interactions.
- Empowered team members and collaborators by providing well-documented, reusable code, comprehensive reports, and training, thereby enhancing the overall reproducibility, transparency, and impact of the research program.
- Accelerated research outputs and scientific communication, delivering actionable insights and high-quality figures/tables for manuscripts, presentations, and stakeholder reports in the field of microbial ecology and bioinformatics.

Department of Ecology and Evolutionary Biology

Tulane University, New Orleans, LA

Aug. 2018 – Aug. 2024

- Owned experimental design, data collection, analysis and interpretation for 3 research projects focused on understanding the interactions of fungal symbionts, and host-associated genes, resulting in production of 2 peer-reviewed articles.
- Developed R, Python, and Bash modules to process genomic and metagenomic data by applying the DADA2 and USEARCH algorithms for novel fungal discovery.
- Applied GLMMs, ANOVAs, and clustering algorithms (PCA, LDA) in R to analyze biological datasets or 3 research projects.
- Executed the processing workflows via SLURM on a HPC cluster environment.
- Collaborated with a 6+ member team to develop workflows for troubleshooting genomic data processing pipelines with GATK tools, resulting workflow is hosted on GitHub.
- Enhanced R package function features to handle additional diversity measures; forked and submitted pull request to the open-source "mirlyn" package.
- · Cleaned, validated and submitted genomic data to public relational databases NCBI and GenBank.
- Managed genomic relational databases (100K+ rows and 10+ tables) and documented data processing and dependencies on GitHub to ensure reproducibility of statistical analyses.
- Developed and maintained training vignettes to increase team's data analytics and bioinformatic core competencies in R and Bash to operate in HPC cluster environment and Unix-like systems.
- Communicated research outcomes to stakeholders and the scientific community by presenting at 4 national and 2 international conferences.

School for Environment and Sustainability

University of Michigan, Ann Arbor, MI

Aug. 2015 - May 2018

ECOLOGICAL DATA ANALYST

DATA SCIENTIST

- Led team on a 4-month biological sample collection in Mexico; designed experiment, coordinated sample QC, data collection and exploratory data analyses in R.
- Applied GLMMs, ANOVAs, PERMANOVA analyses to understand interactions of ants and leaf litter nutrients in the tropics; visualized results with "ggplot2" in R.
- Results were published in two articles in high-impact, peer-reviewed journals and presented at international conferences.

Professional Experience _

Earth Science Information Partners

TECHNICAL LEAD & PLATFORM ARCHITECT

Severna Park, MD (Remote)
November 2024 - Present

- Technical Lead & Platform Architect for ESIP's "esipDMP: Data Management for Success", defined the Quarto-based site architecture and information model, organizing content into clear domains with sidebar search, global TOC, and page navigation for discoverability.
- Built a clear, efficient front-end on Bootswatch (Cosmo): customized CSS/SCSS and HTML components to establish consistent layout, typography, and reusable patterns that scale for an open-source community of data practitioners.
- Operationalized, contributor-friendly workflows and deployment: architected a GitHub Pages publishing pipeline with deterministic URLs, standardized outputs, and repo-actions/issue templates to streamline PRs and community feedback.
- Led cross-community collaboration (ESIP Data Stewardship Committee), establishing review pathways and content stewardship practices while maintaining a continuously deployed high-signal community-owned public resource.
- Standardized navigation and content templates to reduce contributor friction and maintenance overhead, enabling incremental, peer-reviewed additions while preserving a stable, version-controlled site foundation.

Connolly Alexander Institute for Data Science

Tulane University, New Orleans, LA.

PRODUCT DEVELOPER Jan. – May 2024

- Developed and presented a proposal to enhance accessibility to data science tools like Tableau, R and Python for university students of all skill levels, utilizing public repositories to host shared resources and curricular materials.
- Created and managed a GitHub Pages website for CAIDS, supporting curricular applications and offering accessible resources on data science, including tutorials on version control and introductory R.
- Increased social media engagement by leading a team of 10 data research interns to develop data literacy workshops for the broader student body, which grew social media engagement by 150%.
- Facilitated and led team dynamics with agile strategies to increase efficiency for development of workshops and social media strategies.
- Ensured transfer of knowledge and increased team core competencies through internal workshops (e.g., introduction to Excel, Intro to Project Management).
- Assessed the Data Ambassador Council's impact on fostering a data-driven community on campus and identified the need for enhanced team-building activities and a structured on-boarding process to improve program effectiveness.

Tulanians Who Enjoy R Coding (TWERC)

Tulane University, New Orleans, LA.

Jan. 2023 - Jan. 2024

- Coordinated the R user group at Tulane University with a membership of approximately 15 20 individuals.
- Facilitated development of 4-5 R programming language workshops per semester where students and peers applied coding skills to enhance research methods and tools for academic and professional advancement.
- Played a pivotal role informing the state of data science literacy of members to faculty and staff in order to expand official data science programs and course offerings.

Howard-Tilton Memorial Library

Tulane University, New Orleans, LA.

DATA SCIENCE INSTRUCTOR

COORDINATOR

Sept. - Dec. 2023

- Developed and delivered virtual workshops and training material about version control, data visualization, and R to an audience
 of 70+ people
- Introduction to R 30+ participants
- Introduction to Data Visualization in R 20+ participants
- Introduction to Version Control with Git and Github 20 + participants

Peer-Reviewed Publications

Aponte Rolón, B., Arnold, A. E., Sánchez Juliá, M., & Van Bael, S. A. (2024). Evaluating endophyte-rich leaves and leaf functional traits for protection of tropical trees against natural enemies. *Functional Ecology*, 1365–2435.14717. https://doi.org/10.1111/1365-2435.14717

Aponte Rolón, B., & Perfecto, I. (2023). Between two trees: Environmental effects of I. Micheliana and A. Latifolia on leaf litter ants in a coffee agroecosystem. *Ecosphere*, 14(2), e4442.

https://doi.org/10.1002/ecs2.4442

- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., ... MacGregor-Fors, I. (2020). Mexico ants: Incidence and abundance along the Nearctic-Neotropical interface. *Ecology*, 101(4), e02944. https://doi.org/10.1002/ecy.2944
- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., ... MacGregor-Fors, I. (2020). Mexico's Ants: Who are They and Where do They Live? *The Bulletin of the Ecological Society of America*, 101(2), e01666.

https://doi.org/10.1002/bes2.1666

Schmitt, L., **Aponte Rolón, B.**, & Perfecto, I. (2020). Evaluating community effects of a Keystone Ant, *Azteca sericeasur*, on *Inga micheliana* leaf litter decomposition in a shaded coffee agro-ecosystem. *Biotropica*, *52*(6), 1253–1261. https://doi.org/10.1111/btp.12833

Under review _____

Dong, C. M., **Aponte Rolón, B.**, Sullivan, J. K., Tataru, D., Deleon, M., Dennis, R., ... Ferris, K. G. (2024, June 29). Short-term fluctuating and long-term divergent selection on sympatric Monkeyflowers: Insights from decade-spanning reciprocal transplants.

https://doi.org/10.1101/2024.06.26.600870

</> Software & Data______

Aponte Rolón, B., Blake, R. E., Berys, C., Gum, J., & Wood-Charlson, E. M. (2025). *esipDMP: Data Management for Success*.

https://doi.org/10.5281/ZENODO.17252143

Aponte Rolón, B., Kristy, B., & Benucci, G. (2025). *BRCore: Provides a set of tools to process and analyze microbial data from bioenergy research centers*. Retrieved from

https://github.com/germs-lab/BRCore. *R package version 0.1.0, commit b3915756f8eef04947597359a2c365349c372a00.*

Rieke, M., & **Aponte Rolón, B.** (2025). *Nplyr: A grammar of nested data manipulation*. Retrieved from https://jibarozzo.github.io/nplyr/. *R package version 0.3.0*.

Other Publications _____

Aponte Rolón, B. (2023). High-Molecular-Weight SPRI-aided DNA extraction from Mimulus (Phrymaceae) leaf tissue. Retrieved from dx.doi.org/10.17504/protocols.io.bp2l6xn8rlqe/v2

Pérez-Figueroa, O., & **Aponte Rolón, B.** (2020). Clashing Resilience: Competing Agendas for Recovery after the Puerto Rican Hurricanes. *Science for the People Magazine*, *23*(1). Retrieved from

https://magazine.scienceforthepeople.org/vol23-1/clashing-resilience-competing-agendas-for-recovery-after-the-puerto-rican-hurricanes/

Grants and Fellowships_____

Department of Ecology and Evolutionary Biology

STUDENT RESEARCH GRANT

Tulane University, New Orleans, LA. 2020, 2021, 2022

Office of Graduate and Post-Doctoral Studies

OGPS FELLOWSHIP

Tulane University, New Orleans, LA. **2021-2022**

Rackham Graduate School

RACKHAM INTERNATIONAL RESEARCH AWARD

University of Michigan, Ann Arbor, Ml. **2017**

Rackham Graduate School

RACKHAM CONFERENCE TRAVEL GRANT

University of Michigan, Ann Arbor, Ml. **2017**

Q Awards & Honors

Steven P. Darwin Outstanding Teaching Assistant Award

EXCEPTIONAL TEACHING OF AN UPPER LEVEL COURSE

Tulane University, New Orleans, LA

May 2024

The Connolly Alexander Institute for Data Science

SUMMER GRADUATE AWARD

Tulane University, New Orleans, LA

June 2023

Graduate Studies Student Association

TRAVEL AWARD

Tulane University, New Orleans, LA

May 2022 & 2023

School of Science and Engineering

DEAN'S TRAVEL AWARD

Tulane University, New Orleans, LA

May 2022 & 2023

School for the Environment and Sustainability

JEFFREY LUND FOREST ECOLOGY AWARD

University of Michigan, Ann Arbor, MI

April 2017

• Annual award for academic excellence, research capability and professional promise.

Teaching Experience

TULANE UNIVERSITY: 2018-2024

Instructor: Howard-Tilton Memorial Library, Tulane University, New Orleans, LA.

- October 2023 | Introduction to Version Control with Git and GitHub. Developed by **B. Aponte Rolón**
- October 2023 | Introduction to Data Visualization in R. Developed by B. Aponte Rolón
- October 2023 | Introduction to R, Part 1. Developed by Mike Ellis and led by B. Aponte Rolón

Teaching Assistant: Department of Ecology and Evolutionary Biology

- Spring 2024 & Fall 2018 | Diversity of Life EBIO 1010. Dr. Jelagat Cheruiyot
- Fall 2020 2023 & Spring 2019 | Entomology EBIO 4430/4431. Dr. Jelagat Cheruiyot
- Summer 2023 | Tropical Field Biology EBIO 3780. Dr. Sunshine Van Bael
- Spring 2023 | Natural History of Louisiana EBIO 2330. Dr. Donata Henry
- Spring 2023 | Theory and Methods in Ecology and Evolutionary Biology EBIO 2020. Dr. Donata Henry
- Spring 2022 | Insects and Human Interactions EBIO 2210. Dr. Jelagat Cheruiyot
- Spring 2021 Fall 2019 | Plants and Human Affairs EBIO 3180/3185. Dr. Keith Clay
- Spring 2020 | Plant Biology and Adaptation EBIO 3590/3591. Dr. Jelagat Cheruiyot

Guest Lectures

- Summer 2023 | Tropical Field Biology EBIO 3780, Dr. Sunshine Van Bael
- Fall 2021 | Tropical Biology EBIO 2110, Dr. Renata Durães Ribeiro
- Fall 2021 | Entomology EBIO 4430/4431. Dr. Jelagat Cheruiyot
- Fall 2019 | Plants and Human Affairs EBIO 3180/3185. Dr. Jelagat Cheruiyot

University of Michigan: 2016 - 2017

- Fall 2017 | NRE 509: Ecology: Concepts and Applications. Dr. Sheila K. Schueller
- Fall 2016 | ENVIRON 270: Our Common Future. Dr. Ivette Perfecto

2 Conference Presentations and Posters

Aponte Rolón, B. (2025 June). *Poster.* "From Granite to Meadow: How Host Genetics and Habitat Shape Foliar Endophyte Communities in Monkeyflowers". Evolution 2025, Athens GA, USA.

Aponte Rolón, B. (2023 June). *Oral Presentation*: "Foliar fungal symbionts in sympatric yellow monkeyflowers along an elevational gradient". Evolution 2023, Albuquerque, NM, USA.

Aponte Rolón, B. (2023 March). *Poster*: "The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA". Collaborators: Kathleen Ferris & Sunshine Van Bael. Tulane Research, Innovation, and Creativity Summit (TRICS), Jung Hotel Grand Hall, New Orleans, LA, USA.

Aponte Rolón, B. (2022 July). *Oral Presentation*: "Interactions between functional leaf traits and foliar endophytes in the defense against natural enemies of tropical trees" (ID: 358). The 58th Meeting of the Association for Tropical Biology and Conservation (ATBC 2022), Cartagena de Indias, Colombia.

Aponte Rolón, B. (2022 May). *Poster*: "The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA". Collaborators: Kathleen Ferris & Sunshine Van Bael. Yosemite Symbiosis Workshop. Wawona, CA, USA.

Aponte Rolón, B. (2020 July). *Graphical Abstract*: "Investigating trade-offs and complementarity between functional leaf traits and foliar endophytic fungi in the defense against plant enemies of tropical woody plants". Collaborators: A. Elizabeth Arnold, and Sunshine Van Bael. The Mycological Society of America's First Virtual Meeting, MSA 2020: Mycology from the Cloud (virtual).

Aponte Rolón, B. (2019 May). *Poster*: "Leaf and Root Endophytes of Mangroves in Southwestern Florida Everglades". Collaborators: Mareli Sánchez Juliá, Edward Castañeda, John Kominoski, & Sunshine Van Bael. Florida Coastal Everglades LTER All Scientists Meeting. Fairchild Tropical Botanic Garden, Miami, Florida.

Aponte Rolón, B. (2017 October). *Poster*: "Quality of leaf-litter and ant assemblages in shade-grown coffee in Chiapas, Mexico", Collaborator: Ivette Perfecto. Student Conference on Conservation Science-New York (SCCS-NY), American Museum of Natural History in New York City, NY, USA.

Aponte Rolón, B. (2017 July). *Poster*: "Impacts of quality of leaf-litter on ant assemblages in shade-grown coffee in Chiapas, Mexico", Collaborator: Ivette Perfecto. 54th Annual Meeting of the Association for Tropical Biology and Conservation, "Ecological and Social Dimensions of Tropical Biodiversity Conservation", Merida, Yucatan, Mexico.

Aponte Rolón, B. (2014 May). *Poster*: "El efecto del Curcumin en la señalización celular de Artritis Psoriática" [The Effect of Curcumin on cell signaling of Psoriatic Arthritis]. (With Carrero Feliciano, Heysel M.; Hall Laureano, Stephanie; Montes González, Ingrid, PhD.) Annual poster presentation of the American Chemical Society, Puerto Rico Chapter, University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Seminars & Workshops

Delegate (Aug. Sept. 2014): "Encuentro latinoamericano y caribeño: asamblea intermedia". [Intermediate Assembly of the Consejo de Educación Popular de América Latina y el Caribe-CEAAL]. Quito, Ecuador.

Delegate (October 2013): *"Rumbo a la asamblea intermedia"*. Sponsored by the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*. Santo Domingo, Dominican Republic.

Organizer (August 2013): "Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico". Sponsored by Consejo de Educación Popular de América Latina y el Caribe-CEAAL, Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

Workshop Developer (August 2013): "Educación Popular y Liberación Nacional" [Workshop on Popular Education and National Liberation] Sponsored by La Nueva Escuela at Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico. Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

Facilitator & organizer (March 2012): "Sexto Campamento de Jóvenes: Educando para una nueva Patria" [Summit on Popular Education Critical Ideologies, Racism & Xenophobia]. La Nueva Escuela, Peñuelas, Puerto Rico.

Organizer (March 2012): "Debates y perspectivas en la construcción de una reforma universitaria inclusiva". Sponsored by Honors Program Student Association (AEPREH), University of Puerto Rico, Río Piedras Campus. Social Sciences Faculty, University of Puerto Rico, Río Piedras Campus, San Juan Puerto Rico.

Round table (July 2012): "Puerto Rico: a brief historical account". Second International Summit "Entre las Crisis y Otros Mundos Posibles" of the Transnational Network of Other Knowledges. Sponsored by Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), CIDECI Las Casas/ UNITIERRA-Chiapas, San Cristóbal de las Casas, Chiapas, México.

Workshop Developer (September 2010): "Taller de Educación Popular" [Workshop on Popular Education]. La Nueva Escuela at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Workshop Developer (May 2010): "Taller de Educación Popular y el Movimiento Estudiantil" [Workshop on Popular Education and the Student Movement]. La Nueva Escuela at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Q Outreach.

NATURE TALK

ECODIA

FIRST

Bayou Regional, New orleans, LA

2022

• Volunteer in robotics competition for high school students

Yosemite Conservancy

FIRST ROBOTICS COMPETITION

Yosemite National Park

2022

• Led public on nature walk and art activity to examine functional significance of leaf shapes.

University of Michigan

Finca Irlanda, Soconusco, Chiapas,

Mexico

2017

• Developed and executed a science communication day for the school.