Esther Rodriguez

Curriculum Vitae

Arizona State University

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Professional Summary

PhD candidate in Data Science seeking Summer 2026 AI internship. Published researcher at NeurIPS 2025 with expertise in foundation models, long-tailed learning in generative AI, and deploying ML systems at scale. Proven ability to bridge cutting-edge research with practical applications. Developed automation pipelines, reducing workflow overhead by 85% and implemented privacy-enhancing technologies for real-world impact

Education

Expected 2026	**PhD in Data Science, Analytics and Engineering**, *Arizona State University* Adviser: Prof. Lalitha Sankar. GPA: 3.98/4.00
2020	**MS in Computer Science,** *University of New Mexico* GPA: 3.64/4.00
2014	**BS in Mathematics,** *Autonomous University of Ciudad Juarez* GPA: 3.75/4.00

Research and Professional Experience

2023-Present — Long-Tailed Diffusion Models
 - Led research on long-tailed learning and representation in diffusion models, and critical challenges in AI systems for underrepresented populations. Published in NeurIPS 2025 main conference.
 - Developed novel latent representation methods (CORAL) that improve generation quality on long-tailed distributions by up to 30%
- Designed and implemented training, sampling, and fine-tuning methods for diffusion models on long-tailed data, including medical datasets, demonstrating ability to handle real-world data distributions
 - Automated computational workflows, reducing experiment time-to-launch by 85% and enabling scaling across multiple GPU cluster environments

2019-Present — Technical Advisor & Co-Founder, Breakpointing Bad (501c3 Nonprofit)
- Co-founder of cybersecurity-focused nonprofit serving at-risk populations globally through privacy-preserving technology
- Provide technical guidance on cryptographic protocols and secure system design
- Our team delivers technology solutions with real-world social impact

2019- 2023 — Privacy-Enhancing Technologies
 - Performed static and dynamic analysis using reverse engineering tools (JADX, Frida, MobSF) to assess trustworthiness and detect security issues of mobile applications and web browsers
- Scaled analysis infrastructure using AWS EC2 and S3, demonstrating ability to operationalize research findings in cloud environments
 - Published research on protecting vulnerable populations from surveillance and targeted attacks

Publications

E Rodriguez, M Welfert, S McDowell, N Stromberg, J Antolin, L Sankar, "CORAL: Disentangling Latent Representations in Long-Tailed Diffusion". In NeurIPS 2025 (Main Conference)

E Rodriguez, M Welfert, S McDowell, N Stromberg, J Antolin, L Sanka, "Improving Generation Quality of Long-Tailed Diffusion via Disentangled Latent Representations". In NeurIPS UniReps Workshop 2025

E Rodriguez, L Gyatso, T Thayai, JR Crandall, "Revisiting BAT Browsers: Protecting At-Risk Populations from Surveillance, Censorship, and Targeted Attack". In Free and Open Communications on the Internet, 2025

Awards and Research Funding

2025 **NAIRR Pilot Start-Up Project** (Principal Investigator)
National AI Research Resource Pilot, National Science Foundation
"Fine-Tuning Stable Diffusion for Medical Imaging: Addressing Class Imbalance and Memorization"
Award: 2,000 GPU-hours on Purdue Anvil AI
2019 **Information Controls Fellowship, Open Technology Fund**
Competitive fellowship awarded to PhD students working on mitigating repressive internet censorship and surveillance
2019 **Open Technology Fund Summit Participant**
2013, 2014 **Summer Research Fellowship, IMATE-National Autonomous University of Mexico**
Awarded to undergraduate students in the mathematical sciences

Teaching and Mentoring Experience

2025 **Undergraduate Student Mentor,** Arizona State University
Mentored undergraduate researchers on generative AI projects and programming best practices
Subject matter expert on generative diffusion models
2017 - 2019 **Instructor of record,** University of New Mexico
Mathematical Foundations of Computer Science, Calculus I, Advanced Calculus I
2015 - 2019 **Teaching assistant/Tutor,** University of New Mexico
Abstract and modern algebra, calculus I and II, advanced calculus, number theory, and topology

Talks/Presentations

CORAL: Disentangling Latent Representations in Long-Tailed Diffusion
Poster Presentation, NeurIPS 2025
Improving Generation Quality of Long-Tailed Diffusion via Disentangled Latent Representations
Poster Presentations, NeurIPS 2025 Workshops (UniReps, WiML, SPIGM)
Enhancing Minority Representation in Conditional Diffusion Models
Comprehensive Exam Talk. ASU, Tempe, Arizona, March 2025