GABRIEL PATRÓN

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Summary

Ph.D. candidate in Statistics at the University of Michigan (advised by Prof. Jeffrey Regier). My research focuses on **personalized generative models**: user-conditioned diffusion and vision–language systems for **generative recommendation** and creative media.

Practical engineering experience building **end-to-end generative pipelines** (PyTorch diffusion, LoRA finetuning, multi-GPU inference). **Award-winning VFX Supervisor** for *Reflejos*, the first Latin American feature film using diffusion-based visual effects.

Experience

AI-VFX Supervisor & Associate Producer, Reflejos *2024 – 2025, Bogotá*
Award: Best Visual Effects, Tabloid Witch Awards 2025 (link), Bogotá Horror Film Festival 2025

- Led the first diffusion-based VFX pipeline for a Latin American feature film, integrating ControlNet and IP-Adapter modules for creative production across 30+ shots.
- Supervised a four-member ML–VFX team and optimized inference/rendering workflows (40% time reduction).
- Trained LoRA models to fine-tune diffusion outputs, improving character consistency across multi-scene sequences.
- Bridged creative and technical teams, converting artistic direction into parameterized diffusion workflows used throughout post-production.

AI Specialist for Media, Dirty Kitchen *2021 – 2022, Bogotá*

- Developed diffusion and DeepFake systems for Colombia's first AI virtual influencer (100K+ media exposures).
- Built early generative media pipelines that later informed the diffusion-based VFX workflows used in *Reflejos*.

Machine Learning Engineer, ADAO *2019–2021, Bogotá*

- Engineered capital requirement pipelines in compliance with Basel FRTB validated against 4000+ regulator tests.
- Built NLP pipelines for 100 GB+ financial text data and compliance modules for ISDA SIMM.

Selected Publications

- **Extended Abstract: Recommendations Beyond Catalogs: Diffusion Models for Personalized Recommendation.**
  ACM Conference on Recommender Systems (Doctoral Symposium), Prague, 2025.
  G. Patrón. DOI: 10.1145/3705328.3748757
- **An Interpretable Automated ML Credit Risk Model.**
  G. Patrón, D. León, E. López, G. Hernández. *Applied Computer Sciences in Engineering (Springer), 2020.*

Preprints / In Preparation

- **Diffusion Models for Inferring Structured Backgrounds in Astronomical Images.**
  G. Patrón, J. Regier (*in preparation for submission to Annals of Applied Statistics 2025*).
  Develops a diffusion-based EM approach to background modeling for astronomical imaging.
- **REBECA: Diffusion Priors for Personalized Image Generation.**
  G. Patrón, Z. Xu, I. Kapnadak, F. Maia Polo. (*in preparation for submission to CVPR 2026*).
  Presents a unified diffusion-prior framework for user-conditioned personalization, trained on 200 K user–image pairs and benchmarked against LoRA and VLM personalization baselines with user-level quantitative evaluation.

Invited Talks & Presentations

- **"Generative Personalization Beyond Catalogs."** Invited Talk, ACM RecSys 2025 Doctoral Symposium, Prague.
- **"Generative Adversarial Networks for Simulation of Climate Processes."** Columbia University IRI Institute (2020). [Video]
- **"Principled Training of GANs via Wasserstein Distance and Gradient Penalty."** Quantil Seminar (2020). [Video]

- **"Automatic Generation of Music Using Markov Chains."** XXVIII International Statistics Symposium (2018) — Best Poster Award. [Link]
- **"Self-Exciting Processes for Modeling Viral Infections."** 5th Interdisciplinary Workshop on Mathematical Modeling of Environment and Evolution (2017).

Awards & Honors

- **Best Visual Effects – Bogotá Horror Film Festival (2025) & Tabloid Witch Awards (2025):** *Reflejos, first AI-based feature film in Latin America.*
- **Invited Doctoral Symposium Participant – ACM RecSys 2025 (Prague).**
- **Best Undergraduate Thesis in Statistics (2020):** *Wasserstein Training of GANs.*
- **First Prize – Banistmo Regional Hackathon (LATAM, 2019).**
- **Best Poster Award – Int'l Statistics Symposium XXVIII (2018).**

Education

University of Michigan, Ann Arbor *Aug 2022 – Present*
Ph.D. in Statistics (Expected May 2027)
Selected Coursework: Regression Analysis, Statistical Learning, Monte Carlo Methods, Probability (Measure Theory), Graphics & Generative Models, Complex Adaptive Systems (Game Theory).
Universidad Nacional de Colombia, Bogotá *Jul 2016 – Apr 2021*
B.Sc. in Statistics (with Honors, GPA 4.6/5.0)

Professional Certificates

- Statistics and Data Science MicroMasters (MIT, edX)
- MicroMasters in Finance (MIT, edX)
- Generative Adversarial Networks Specialization (DeepLearning.AI)
- NLP Specialization (DeepLearning.AI)
- TensorFlow Advanced Techniques (DeepLearning.AI)
- Algorithms Specialization (Stanford University)

Selected Software

- **REBECA (2024–2025):** User-conditioned diffusion prior for personalized generation; supports CLIP embeddings, LoRA finetuning, batch sampling.
- **Stochastic Symphonies (2018):** Multi-instrument Markov-chain music generator; Best Poster Award XXVIII Int'l Statistics Symposium (2018).
- **Ancient Greek Summarizer (2019):** TextRank summarizer for Ancient Greek corpora.

Skills

- **Programming:** Python, PyTorch, Diffusers, HuggingFace, TensorFlow, Django, Git, Docker, CUDA
- **Research:** Diffusion Models, Vision–Language Models, Recommender Systems, Generative Modeling, Simulation-Based Inference
- **Languages:** English (Advanced), French (Advanced), Chinese (Intermediate), Spanish (Native)