Cristobal Lillo

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Experience

University of Miami — Coral Gables, FL

Research Assistant, Frost Institute for Data Science and Computing — *April 2025 – Present*

- Researched distributed segmentation frameworks combining federated learning with self-attention mechanisms to improve model performance on heterogeneous medical datasets.
- Unified diverse segmentation datasets (Cityscapes, ADE20K, CUB-200) into standardized pipelines using torchvision transforms and batch samplers.
- Benchmarked segmentation architectures via controlled ROC-AUC analysis to establish baseline performance.
- Scaled training/inference for base and fusion modesl across 4 L40 GPUs using **PyTorch Distributed Data Parallel (DDP)**.

Teaching Assistant, Department of Computer Science — *August 2024 – Present*

- Refactored legacy Python 2.7 scripts for HW grading, fully automating assignment collection, marking, and return with Python3's subprocess library for a revamped Computer Programming II curriculum.
- Led labs and office hours for 500+ students, teaching DSA and OOP in Java and Python.

Examedi.cl (YC S21) — June 2024 – August 2024

Software Developer Intern — *Santiago, Chile*

- Developed internal tooling using **BeautifulSoup4** and **regex** to streamline clinic and practitioner onboarding.
- Performed geospatial analysis on transaction data to identify underserved regions with high patient demand and excessive travel times.

SmartUp — December 2024 – January 2025

Software Developer Intern — *Santiago, Chile / Remote*

- Optimized large response handling for AI agents with the OpenAI API by migrating from completion to streaming packets, reducing latency by 25% and eliminating large packet losses.
- Built type-safe **tRPC** routes in **Next.js** to support streaming functionality and maintain data and conversation concurrency.

Projects

tinyHPO | *Python, tinygrad, tinyJIT* — 2025

- Contributed to the open-source **tinygrad** (30k stars) ML framework by developing scalable hyperparameter optimization tooling for deep NNs.
- Developed **tinygrad**-specific, model-agnostic GridSearch, Bayesian, and random search optimization compatible with all accelerator backends.
- Reduced search times through lazy evaluation by enforcing **tinyJIT**-based execution in tensor operations.

Education

University of Miami — Coral Gables, FL

BS in Computer Science, BS in Mathematics, Physics minor — *Class of 2027*

- GPA: 3.86. Honors: Singer Scholar (Full Tuition Scholarship), Foote Fellow (Honors student)

Skills

Languages: Python, Julia, Java, C, TS/JS, R, Lua
Dev Tools: Docker, Wandb, uv, SSH, GitHub Actions, Next.js, Vercel, Neovim
ML: PyTorch, Pandas, Polars, NumPy, tinygrad, GradCAM, CUDA, FlashAttention, pydantic, Pillow