Ignacio Hounie

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EDUCATION

University of Pennsylvania, School of Engineering and Applied Science — Philadelphia, PA
PhD Electrical and Systems Engineering. GPA: 3.97. — *2021 - 2026*

University of Pennsylvania, Wharton School — Philadelphia, PA
MA Statistics and Data Science. — *2021 - 2024*

Universidad de la República, Facultad de Ingeniería — Montevideo, Uruguay
Bsc. Electrical Engineering, Signal Processing. — *2015 - 2021*

PUBLICATIONS

Feasible Learning (2025): Ramírez, J., **Hounie, I.**, Elenter, J., Gallego-Posada, J., Ribeiro, A., Lacoste-Julien, S., (To appear at AISTATS).

LoRTA: Low Rank Tensor Adaptation of Large Language Models (2024): **Hounie, I.**, Kanatsoulis, C., Tandon, A., Ribeiro, A., Arxiv preprint (under review).

Loss Shaping Constraints for Long-Term Time Series Forecasting (2024): **Hounie, I.**, Porras, J., Ribeiro, A., International Conference on Machine Learning (ICML).

Resilient Constrained Learning (2023): **Hounie, I.**, Ribeiro, A., Chamon, L. F. O., Conference on Neural Information Processing Systems (NeurIPS).

Automatic Data Augmentation via Invariance-Constrained Learning (2023): **Hounie, I.**, Chamon, L. F. O., Ribeiro, A., International Conference on Machine Learning (ICML).

Neural Networks with Quantization Constraints (2023): **Hounie, I.**, Elenter, J., Ribeiro, A., International Conference on Acoustics, Speech and Signal Processing (ICASSP).

Image Inpainting using Patch Consensus and DCT Priors (2021): Ramírez, I., **Hounie, I.**, Image Processing On Line Journal (IPOL).

DCASE-models: A Python library for computational environmental sound analysis using deep-learning models (2020): Zinemanas, P., **Hounie, I.**, Cancela, P., Font, F., Rocamora, M., Serra, X., 5th Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE).

PACO and PACO-DCT: Patch consensus and its application to inpainting (2020): Ramírez, I., **Hounie, I.**, International Conference on Acoustics, Speech and Signal Processing (ICASSP).

EXPERIENCE

Amazon — Sunnyvale, CA.
Applied Scientist Intern. — *Summer 2024*

> **Distribution Shift Mitigation for large-scale classification systems**: Developed online conformal calibration, continual learning, and unsupervised test-time adaptation methods to adapt tabular, multimodal, and language model-based classifiers under distribution shift.

UdelaR - Institute of Electrical Engineering. — Montevideo, Uruguay.
Research and Teaching Assistant at the Signal Processing Department. — *2019 - 2021*

> **Environmental sound monitoring**: Developed Machine Listening algorithms for urban sound monitoring in collaboration with Montevideo city council.
> **Time series anomaly detection**: Developed time series modeling and unsupervised anomaly detection algorithms for a telecommunications service provider. Implemented a data annotation pipeline using Grafana and influxDB.
> **Image and video restoration**: Implemented inpainting and automatic image registration algorithms for film restoration on university archives.
> **Teaching**: Machine Learning undergraduate course and hands-on electrical engineering introductory course.
> **Data Science Interdisciplinary Center**: Participated in *Genomics and Evolution* group.

Montevideo Labs.   Montevideo, Uruguay.
Data Engineer for Globalization Partners.   *2021*

ETL pipelines: Developed and deployed ETL pipelines using AWS.
Service integration: Lead the data integration of a forecasting and planning service with an applicant tracking service.
Business intelligence: Assisted the B.I. department on data extraction and analysis.

TEACHING

Artificial Intelligence Lab: (UPenn ESE2000) Spring 2023 and 2024, undergraduate level hands-on introductory course to Machine Learning. Collaborated developing Jupyter notebooks for practicals and assignments, homework handouts, and assisted in lab sessions.

Signal and Information Processing: (UPenn ESE2240) Fall 2022, Introductory Signal level processing class. Assisted in practical sessions, office hours and grading.

Graph Neural Networks: (UPenn ESE5140) Fall 2023 and Fall 2023, Graduate Course on Machine Learning on graphs. Assisted in office hours and grading.

PRESENTATIONS

Something old, something new, something borrowed: Evaluation of different neural network architectures for genomic prediction(2023).: Fariello, M. I., Arboleya, L., Belzarena, D., Santos, L., Elenter, J., Etchebarne, G., **Hounie, I.**, Ciappesoni, G., Navajas, E., Lecumberry, F. Plant and Animal Genome Conference (PAG 30).

Graph convolutional neural networks for genome enabled prediction of complex traits (2021): **Hounie, I.**, Elenter, J., Etchebarne, G., Poster accepted at: CSHL Probabilistic Modeling In Genomics.

On two dimensional mappings of SNP marker data and CNNs: overcoming the limitations of existing methods using Fermat distance (2021): Elenter, J., Etchebarne, G., **Hounie, I.**, CSHL Probabilistic Modeling In Genomics.

Machine Learning methods for genome enabled prediction of complex traits in agriculture: benchmarking and robustness to marker elimination (2021): Etchebarne, G., **Hounie, I.**,Elenter, J. CSHL Probabilistic Modeling In Genomics.

On Machine Learning Methods for Genome Enabled Prediction of Complex Phenotypes (2020): Elenter, J., Etchebarne, G., **Hounie, I.**, Presented at: IEEE ArgenCON.

PROJECTS & ACTIVITIES

Reviewer (2023-present): Reviewed conference papers for Neurips, AISTATS, ICASSP.

Electrical and Systems Engineering PhD Association (2023-present): Board Member. Helped organize PhD colloquia and social events.

Wharton AI and Analytics Graduate Club (2022-present): VP of external affairs (2022) and Technical Principal (2023-2024). Helped organize talks, hackathons and events on Machine Learning and AI for Wharton Graduate Students. Focused on to connecting technically minded individuals with the Wharton MBA community. Member of the Wharton AI and Analytics for Business Student Advisory Board.

DNAi (2020-2021): Undergraduate capstone project. Genome enabled complex phenotype prediction using Machine Learning techniques. Advisors: María Inés Fariello, Federico Lecumberry

Dynamics of quantum correlations in two-qubit open systems (2020): Undergraduate research project, proposal elected and funded by CSIC (Uruguay) student research program.

Ingenioton Challenge (2019-2020): Developed electronics and control module for an electric stander for disabled children, as part of a program funded by the Teleton foundation.

NASA Space Apps Challenge Global Finalist (2019): Improving the performance of Machine Learning and predictive models by filling in gaps in the datasets prior to model training through crowdsourcing, using dimensionality reduction, visual representations and reinforcement learning.

Lapassion (2019): Selected to participate in the Latin America Soft Skills and Innovation program. Worked on K-12 foreign language learning games.

SKILLS

Languages: Spanish (native), English (Fluent)

Progamming languages: Python (preferred), C, C++, R , Matlab

Technologies and Frameworks: PyTorch, Jax, Docker, Kubernetes, AWS, Linux, Slurm.