Ignacio Hounie

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Education

- **University of Pennsylvania** — Philadelphia, PA
  PhD Electrical and Systems Engineering. — *2021 - Present*

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

Experience

- **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.

- **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.

Publications

- **Resilient Constrained Learning (2023)**: Hounie, I., Ribeiro, A., Chamon, L., Accepted to NeurIPS.
- **Neural Networks with quantization constraints (2023)**: Hounie, I., Elenter, J., Ribeiro, A., ICASSP.
- **Automatic Data Augmentation via Invariance-Constrained Learning (2023)**: Hounie, I., Chamon, Luiz F. O., Ribeiro, A., International Conference on Machine Learning (ICML).
- **Image Inpainting using Patch Consensus and DCT Priors (2021)**: Ramírez, I., Hounie, I., Image Processing On Line Journal.
- **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.
- **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).

Teaching

- **Artificial Intelligence Lab. Data, Systems, and Decisions** : Spring 2023, 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**: Fall 2022, Introductory Signal level processing class. Assisted in practical sessions, office hours and grading.
- **Graph Neural Networks**: Spring 2022 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

- **Electrical and Systems Engineering PhD Association (2023-present)**: Board Member. Helped organize PhD colloquium and social events.
- **Wharton AI and Analytics for Business Student Advisory Board (2023-present)**: Member. Participated collecting student feedback, encouraging engagement, and sharing resources to improve student experiences and access to analytics resources and opportunities at Wharton as a Club leader.
- **Wharton Graduate Analytics Club (2022-present)**: VP of external affairs. Organized talks on Machine Learning and Ai applications with external speakers.
- **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.
- **Ingeniotón Challenge (2019-2020)**: Developed electronics and control for an electric stander for disabled children.
- **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), Portuguese (Fluent)
- **Progamming languages**: Python (preferred), C, C++, R , Matlab
- **Technologies and Frameworks**: PyTorch, Tensorflow and Keras, Docker, Kubernetes, AWS, Slurm, Linux, RaspberryPi, Arduino.