Hugo Thimonier, PhD

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About Me

I am a Multimodal Research Scientist at Emobot, working on **Machine Learning (ML) for Audio and Video**. I hold a PhD in Computer Science from CentraleSupelec focused on **deep learning for tabular data**, in particular **anomaly detection** and **self-supervised learning** for tabular data. Prior to my PhD, I worked as a deep learning scientist intern at L'Oreal R&I where I focused on ML for video.

Education

Ph.D **CentraleSupélec, LISN**, Computer Science — 2020 - 2024

- **Title**: Advancing Anomaly Detection in Tabular Data: A Case-Study on Credit Card Fraud Identication.
- **Supervisors**: Bich-Liên Doan, Fabrice Popineau, Arpad Rimmel.
- **Jury**: Louise Travé-Massuyès, Alain Celisse, Marius Kloft, Gaël Varoquaux and Alamir Mazen.

M.Eng **ENSAE**, *Statistics, Probabilities and Computer Science* — 2018 - 2020
M.Sc **ENS Paris-Saclay**, *Normalien Fonctionnaire-Stagiaire* — 2015 - 2020
DU **Paris 1 - Panthéon Sorbonne**, Russian — 2020 - 2022

Experience

Emobot, AI Research Scientist — Paris, Fr, 2024 - now

CentraleSupélec, LISN, PhD Candidate — Paris, Fr, 2020 - 2024

- Topics: *Anomaly Detection, Self-Supervised Learning, Deep-Learning for Tabular Data.*
- Proposed **three novel anomaly detection** methods for tabular data: improved my **project management** capabilities.
- Supervised a research project of a 1st-year PhD Student: improved my **management skills**.
- Coded from scratch deep learning models in PyTorch and Python.
- Presented my research to multidisciplinary seminars: improved my **popularization skills**.

CentraleSupélec, Teacher in the Computer Science Department — Paris, Fr, 2020 - 2024

- **Course**: *Python* (24h/year), *Artificial Intelligence* (20h/year).
- **Topics Covered**: *OOP, Algorithmic, Data types, Machine Learning, Search Problems (e.g. Adversarial Search Problems, Local Search Problems), Markov Decision Process, Reinforcement Learning, Logic.*

L'Oreal Research & Innovation, Deep Learning Scientist Intern — Paris, Fr, 2019 (6 months)

- Developed a **novel post-processing model to enforce temporal consistency in videos** which were processed frame by frame using non-transformation equivariant image-trained algorithms (Paper: here).

Skills & Interests

Languages: French (native), English (fluent), Spanish (B1), Russian (A2).

Coding: Python, LateX, SLURM, Gitlab/GitHub, UNIX.

ML Toolkit: PyTorch, Scikit-learn, Pandas, Numpy, W&B, Docker.

Sport: Tennis, Running (STRAVA), Fly Fishing, Chess ().

Volunteering: Mathematics teacher at Institut Villebon Georges Charpak (2019-2020).

Publications

Conference Proceedings

[1] **Hugo Thimonier** et al. "Beyond Individual Input for Deep Anomaly Detection on Tabular Data". In: *Proceedings of the 41st International Conference on Machine Learning*. Ed. by Ruslan Salakhutdinov et al. Vol. 235. Proceedings of Machine Learning Research. PMLR, 21–27 Jul 2024, pp. 48097–48123. URL: https://proceedings.mlr.press/v235/thimonier24a.html.

[2] **Hugo Thimonier** et al. "Comparative Evaluation of Anomaly Detection Methods for Fraud Detection in Online Credit Card Payments". In: *Proceedings of Ninth International Congress on Information and Communication Technology*. Ed. by Xin-She Yang et al. Singapore: Springer Nature Singapore, 2024, pp. 37–50. ISBN: 978-981-97-4581-4.

[3] **Hugo Thimonier** et al. "Learning Long Term Style Preserving Blind Video Temporal Consistency". In: *2021 IEEE International Conference on Multimedia and Expo (ICME)*. 2021, pp. 1–6. DOI: 10.1109/ICME51207.2021.9428445.

[4] **Hugo Thimonier** et al. "Retrieval Augmented Deep Anomaly Detection for Tabular Data". In: *Proceedings of the 33rd ACM International Conference on Information and Knowledge Management (CIKM '24), Boise, ID, USA*. New York, NY, USA: Association for Computing Machinery, 2024. DOI: https://doi.org/10.1145/3627673.3679559.

[6] **Hugo Thimonier** et al. "TracInAD: Measuring Influence for Anomaly Detection". In: *2022 International Joint Conference on Neural Networks (IJCNN)*. 2022, pp. 1–6. DOI: 10.1109/IJCNN55064.2022.9892058.

Preprints

[5] **Hugo Thimonier** et al. *T-JEPA: Augmentation-Free Self-Supervised Learning for Tabular Data*. 2024. arXiv: 2410.05016 [cs.LG]. URL: https://arxiv.org/abs/2410.05016.

References

Available on Request.