

Eloi Campagne

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Professional Summary

I am a PhD candidate at ENS Paris-Saclay, within the Learning and Information Processing Systems (LIPS) team at Centre Borelli, in collaboration with EDF Lab's energy forecasting group. Supervised by Argyris Kalogeratos, Mathilde Mougeot, Yvenn Amara-Ouali, and Yannig Goude, my research focuses on developing and evaluating graph-based neural network methods for forecasting electricity consumption and production to improve power grid management.

Publications

1. **Campagne E.**, Amara-Ouali Y., Goude Y., Zehavi I. & Kalogeratos A. (2025). *Graph Neural Networks for Electricity Load Forecasting*. **Preprint**. <https://arxiv.org/pdf/2507.03690v3>.
2. **Campagne E.**, Amara-Ouali Y., Goude Y., Mougeot M. & Kalogeratos A. (2026). *Cascaded Transfer: Learning Many Tasks under Budget Constraints*. **Preprint**. <https://arxiv.org/pdf/2601.21513v2>.
3. Abel G., **Campagne E.**, Benloughmari M. & Kalogeratos A. (2026). *Dual-Criterion Curriculum Learning: Application to Temporal Data*. **Preprint**. <https://arxiv.org/pdf/2603.23573>.
4. **Campagne E.**, Amara-Ouali Y., Goude Y. & Kalogeratos A. *Leveraging Graph Neural Networks to Forecast Electricity Consumption* (2026). In **Joint European Conference on Machine Learning and Knowledge Discovery in Databases**, vol. 2558, Communications in Computer and Information Science, Springer. <https://arxiv.org/pdf/2408.17366>.

Research Software

- **CASCADER**. Python repository accompanying the Cascaded Transfer Learning paper. Implements the CTL framework with notebooks for synthetic, time-series, and image classification experiments.
- **GraphToolbox**. Python package for graph machine learning focused on electricity load forecasting. Provides tools for data handling, model building, training, evaluation, and visualization.

Talks & Presentations

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| 09/2025 | Plugging Attention into Power Grids: Towards Transparent Forecasting , ECML PKDD — ML4SPS workshop. Porto, Portugal.
<i>This talk examines the effectiveness of Graph Neural Networks (GCN, APPNP, GATv2) for electricity consumption forecasting in France and the UK. Results show that simple architectures can perform well in low-data or fragmented settings, while attention-based models enhance interpretability. Ensemble methods are also explored to improve robustness under data heterogeneity.</i> |
| 06/2025 | Graph-Based Weight Cascading Methods for Multisite Time Series Forecasting , Journées de Statistiques (SFdS). Marseille, France.
<i>The talk introduces a novel graph-based approach to time series forecasting by leveraging weight cascade across tasks within a minimum spanning tree or a minimum cost arborescence structure.</i> |

- 09/2024 | **Leveraging Graph Neural Networks to Forecast Electricity Consumption**, ECML PKDD — ML4SPS workshop. Vilnius, Lithuania.
This talk presents the use of GNN for forecasting electricity consumption. In particular, graph inference and explainability methods are presented, with applications on synthetic and real datasets.
- 05/2024 | **Forecasting Net Load in France: The EDF Data-Challenge**, Journées de Statistiques (SFdS). Bordeaux, France.
This talk presents a Data-Challenge focused on improving short-term electricity net demand forecasting in the context of a decentralized power grid.

Student Supervision

- 2025 | **Itai Zehavi**, M1 ARIA — ENS Paris-Saclay
Analyzed Graph Attention Networks (GATs) for electricity forecasting and explored explainability methods for transformers and GNNs.

Education

- 2024 - 2027 | **École Normale Supérieure Paris-Saclay**, Gif-sur-Yvette, France
PhD in Mathematics
- 2022 - 2023 | **École Normale Supérieure Paris-Saclay**, Gif-sur-Yvette, France
M.Sc Mathématiques, Vision, Apprentissage (MVA)
- 2021 - 2022 | **Twente University**, Enschede, Netherlands
Erasmus Exchange Program — Applied Mathematics
- 2020 - 2023 | **Télécom SudParis**, Évry, France
B.Sc & M.Sc — Engineering Degree

Personal Projects

- **PostdocTracker**. An interactive web application to track and visualize opportunities in machine learning and related fields.
- **Interactive Map of French Municipal Elections**. An interactive map visualizing the dynamics of municipal elections in France, allowing users to explore voting patterns across parties and time periods.
- **Mashup-Finder**. An application to compute song analytics and find potential mashup candidates based on tempo, key, energy, and danceability.