Benjamin Cottreau

PhD in Economics – Seeking a **post-doc** position

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My work focuses on the use of explainable machine learning techniques to model public transport demand, with a focus on anomalous patterns and unplanned events.

Work experience

PhD in Economics
LAET / Keolis, Lyon
September 2021 - May 2025

- Worked on the economic resilience of urban public transport networks through time-series analysis, spatial econometrics and explainable machine learning.
- Characterised spatiotemporal patterns of disruptions' impact on public transport demand using ticketing data and unsupervised classification techniques.
- Developed a tree-based disruption detection model using explainable machine learning and spatial probabilistic approaches.
- Improved short-term demand forecasting models using deep learning algorithms together with disruption detection modules.

Part-time Lecturer
ENTPE, Lyon
Febuary 2023- March 2025

- Taught Sustainable Development & Mobility, Statistics, Modelling and Data Project courses (66 hours total)

Transport Management Consultant
Algoé Consultants, Lyon
September 2018 – September 2021

- Participated in new infrastructure, maintenance and operations project management for the following transit agencies: SNCF (Paris, Marseille, Lille, Lyon), SYTRAL (Lyon) and DREAL (Marseille, Lyon).
- Developed data-oriented research projects on public transit pricing and railway asset management
- Participated in the development of *value management* within the company and conducted several value management-based studies for SNCF. Certified *Qualified Valued Associate* since May 19th, 2022.

Transport Analyst
David Simmonds Consultancy, Edimburgh
March 2018 – September 2018

- Developed a cycling accessibility calculation module to improve Land-Use and Transport Interaction (LUTI) models
- Contributed to set up a LUTI model for the French territory, with the definition and the assessment of socio-professional categories, household characteristics, demographic trends, and economic growth assumptions.

Publications

- Cottreau, B., Adraoui, A., Manout, O.,& Bouzouina, L. (2023). Spatio-temporal patterns of the impact of COVID-19 on public transit: an exploratory analysis from Lyon, France. *Regional Science Policy & Practice*. DOI: https://doi.org/10.1111/rsp3.12718
- Cottreau, B., Manout, O., & Bouzouina, L. (2025). Spatio-temporal impacts of unplanned service disruptions on public transit demand. *Transportation Research Interdisciplinary Perspective*. DOI: https://doi.org/10.1016/j.trip.2025.101354
- **[In production]** Cottreau, B., Celbiş, M.G., Manout, O., & Bouzouina, L. (2025). Detection of subway service disruptions and contribution of alternative stops to public transit resilience. Paper under review in *Transportation Research Part A*: Policy & Practice.
- **[In production]** Cottreau, B., Manout, O., & Bouzouina, L. (2025). Improving public transit demand forecasting models in case of disruptions: an integrated approach using explainable AI.

Education

PhD in Economics
LAET - Lyon 2 University
(Sept. 2021 -)

Master in Urban Studies & Economics
Lyon 2 University
(2017-2018)

Engineering degree in Transportation
ENTPE, Lyon
(2014-2018)

Skills

Computing

- **Language**: *Python / R*
- **Libraries**: *keras, tensorflow, scikit-learn, shap*
- **Machine Learning**:
Tree-based (Random Forest)
Deep learning (LSTM, GRU)
Clustering (GMM)
Explainable ML (SHAP)
- **GIS :** QGIS

Econometrics

Time series analysis
Spatial econometrics

Language

French (native)
English (professional)

Commitments

Association leadership
(2016-2018)

Staff representative
(2023-2024)