Federico Pavone

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Researcher specialized in Bayesian Statistics

Experience

Nov 2023 – present **Postdoctoral Fellow**, Université Paris Dauphine-PSL, Paris, France
- **Winner** of *Marie Skłodowska-Curie COFUND Postdoctoral Fellowship*
- **Initiated external collaborations**:
  - with Oxford and Warwick University, Queensland University of Technology, and Red Cross (IFRC) – built 1 year road-map for performance and scalability improvements of **spatio-temporal forecasting** of civil conflicts for optimal resource allocation in humanitarian missions;
  - with Criteo (adTech) on **fairness in ML models** – analysed different sources of bias in online job advertising (paper) and provided a new large real-world tabular dataset ($> 10^6$ observations).
  - with Florence University on **casual inference** – identified open problem and required methodologies to adjust for graph-based spillover effects in observational studies.
- **3 invited talks** at statistical conferences.

2019–2023 **Doctoral Researcher**, *Bocconi University*, Milan, Italy
- Designed new Bayesian models for challenging real-world problems:
  - **Age–specific mortality forecast**: reduced prediction error (by 10%) and improved probabilistic coverage (only 1.3% error to nominal coverage) compared to state-of-the-art methods on 10–years–ahead forecasts;
  - **Network data analysis**: first *tree–based latent position model* for graphs which provides hierarchical node structures with uncertainty quantification. Applied to brain connectivity data, we estimate a new multi–resolution structure of the brain regions coherent with known brain partitions.
- **Publication** in *The Annals of Applied Statistics* journal;
- **5 invited talks** at statistical conferences;
- **Best poster award** at International Society of Bayesian Analysis (ISBA) 2022 world meeting;
- **Reviewer** for statistical journals (including Bayesian Analysis and Demographic Research);

2020–2023 **Teaching Assistant**, *Bocconi University*, Milan, Italy
- Lectures and project supervision for 7 courses in statistics and machine learning (>100 students).

Skills

Scientific: Bayesian Statistics, Time Series, Network Data, Fairness in ML, Causal Inference

Technical: R, Python (`pytorch`, `xgboost`, `pandas`, `sklearn`, `jax`, `optuna`), Stan, C++, Matlab, Git

Languages: Italian (native), English (fluent), French (intermediate)

Education

2024 **PhD in Statistics, Bocconi University**, Milan, Italy
Advisor: Daniele Durante, **Title**: Advances in Bayesian modelling of array structured data

2016, 2019 **BSc and MSc in Mathematical Engineering, Polytechnic University of Milan**, *with honors*

Miscellaneous

Schools and short courses: Optimal Transport for Bayesian Statistics, Data Analysis on the Sphere, Probabilistic Numerics, Bayesia Nonparametric for Causal Inference

Selected Papers

2024 **F. Pavone**, R. Browning, H. Patten, R. Ryder, K. Mengersen, and J. Rousseau, "Statistical modelling of spatio-temporal conflicts at large scale", *working paper*

2024 **F. Pavone**, D. Durante, and R. Ryder, "Phylogenetic latent position models", *working paper*

2024 M. Vladimirova, **F. Pavone**, E. Diemert, "FairJob: A Real-World Dataset for Fairness in Online Systems", (*submitted*), [arXiv], [code]

2024 **F. Pavone**, S. Legramanti, and D. Durante, "Learning and forecasting of age-specific period mortality via B-spline processes with locally-adaptive dynamic coefficients", **The Annals of Applied Statistics**, pp. 1965-1987, [arXiv], [code]

2023 **F. Pavone**, J. Piironen, P.-C. Bürkner, and A. Vehtari, "Using reference models in variable selection", **Computational Statistics**, pp. 1–23, [arXiv], [code]