MATTEO **COURTHOUD**

Senior Applied Scientist

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Skills

AB Testing: geo experiments, sequential testing, variance reduction, heterogeneous treatment effects, interleaving, switchback experiments.

Causal Inference: matching, IPW, synthetic control, difference-in-differences, DML, TMLE.

Machine Learning: supervised and unsupervised models, bagging, boosting, reinforcement learning.

Economics: demand estimation, game theory, market design.

Coding

Python: numpy, scipy, pandas, pyspark, sklearn, XGBoost, LightGBM, pytorch, flaml, PyMC, EconML.

R: MatchIt, WeightIt, grf, DoubleML, fixest, staggered.

Other: SQL, Julia, Matlab, Stata.

Misc: Spark, Git, AWS, Docker, Databricks.

Other

- **Technical Writer**, on Towards Data Science on statistics and causal inference.
- **Presenter**, PyData Zurich (2023).
- **1st place**, Machine Learning Datathon at ETH Zurich (2021).
- **Maintainer**, awesome-causal-inference repository on Github.
- **Languages**: Italian (native), English, French (fluent), German, Spanish.

Work Experience

Senior Applied Scientist, Aug 2023 - ongoing   **Zalando**, Berlin
- Domains: loyalty (Plus subscription program), assortment (catalog and curation), internal experimentation and causal inference consulting.
- Experimentation: design and analysis of complex experiments involving long-term holdouts, stratified designs, partial compliance, variance reduction, continuous testing, long-term effects, dilution.
- Observational causal inference: policy evaluation in settings with selection into treatment.
- Organizer of the internal causal inference seminar.
- Responsible for internal observational causal inference guidelines and toolbox.
- Technical interviewer at senior and principal level.
- Presenter at CausalAI, PyData, and internal conferences.

Data Science PhD Intern, fall 2022   **Google**, Switzerland
- Developed new generation of estimators for geographical experiments (GeoX) to test returns to advertising, combining quasi-experimental methods with matched pairs design.
- Developed internal library to test estimators at scale, combining real data and simulated experiments.

Economic Consultant, 2021 - 2022   **Crawford Consulting GmbH**
Provided independent economic research on strategic entry, exit, and pricing decisions for Amazon.com, using both observational and quasi-experimental methods on proprietary business data.

Teaching Assistant, 2018 - 2022   **University of Zurich**, Switzerland
Lectured, assisted and prepared teaching material for courses:
- MsC Econometrics and Machine Learning (Damian Kozbur)
- PhD Econometrics (Damian Kozbur)
- PhD Industrial Organization (Gregory Crawford)

Economics Intern, spring 2016   **DG COMP**, EU Commission
Provided economic and statistical analysis of auction data for the Halliburton-Baker Hughes (10B$) merger case, combining applied causal inference methods with structural modeling.

Education

Ph.D. Economics, 2017 - 2023   **University of Zurich**, Switzerland
Specialization: Econometrics, Statistics, Industrial Organization.
Advisors: *Gregory Crawford*, *Armin Schmutzler*, *Damian Kozbur*.

Research areas:
- Dynamic structural estimation of ratings and reviews externalities in the peer-to-peer rental market.
- Detection and prevention of pricing algorithmic collusion in high-frequency markets using reinforcement learning.
- Dynamic stochastic games of oligopolistic competition in presence of product complementarities and economies of scale.

Visiting Doctoral Student, fall 2021   **Yale University**, United States
Host: *Steven Berry*, Department of Economics.

M.Sc. Economics, 2014- 2016   **Bocconi University**, Italy
Specialization: Econometrics, Industrial Organization.

B.Sc. Economics, 2011- 2014   **Bocconi University**, Italy