



# MATTEO COURTHOUD

Senior Applied Scientist



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matteocourthoud



matteo-courthoud

## 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.
- **Presenter**, CausalAI (2024), PyData Zurich (2023).
- **1st place**, Machine Learning Data-thon at ETH Zurich (2021).
- **Maintainer**, *awesome causal inference* Github repository.
- **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