



# MATTEO COURTHOUD

Senior Applied Scientist

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## Skills

**Statistics:** causal inference, A/B testing, experimental design, GLM, maximum likelihood, bayesian models, hierarchical models

**Machine Learning:** supervised and unsupervised models, bagging, boosting, reinforcement learning, double machine learning

**Mathematics:** numerical optimization, gradient descent, dynamic programming

**Economics:** demand estimation, recommendation systems, game theory, market design, auction design

**Computing:** parallelization, multi-threading, probabilistic programming

## Toolbox

SQL • Databricks • Github • Unix

Docker • AWS • BigQuery

## Coding

**Python:** numpy, scipy, pandas, sklearn, XGBoost, LightGBM, flaml, PyMC, EconML, causalm, pyspark, seaborn, plotly

**R:** tidyverse, dplyr, fixest, staggered, grf, ggplot2

**Julia:** Optim, DataFrames, Plots

**Misc:** Stata, Matlab, Go, C++, Visual Basic, Pascal

## Work Experience



**Senior Applied Scientist**, Aug 2023 - ongoing **Zalando**, Berlin  
Estimated value of Zalando Plus subscription program, combining double-machine learning observational causal inference methods and customer lifetime value (CLV) projections. Improved customer targeting based on heterogeneous treatment effect estimation on CLV. Identified areas of intervention for logistic costs optimization.



**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 (diff-in-diffs, synthetic control) with paired experimental design. Wrote production-level 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

## 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)
- **Languages:** Italian (native), English, French (fluent), German, Spanish (basic)