





Contact me  

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[Website](#)

born September, 27, 1993

## Languages

**German** (Native)  
**English** (Proficient)  
**Italian** (Elementary)

## Academia

### Workshop Organizer

DynXAI at ECML PKDD 2023  
TempXAI at ECML PKDD 2024

### Reviewer

ICLR'25, NeurIPS'24, ICML'24, AAAI'25,  
AISTATS'25, MLJ, ESANN'24

## Awards & Certificates

### Best Paper Award

XAI'23  
ECML'23 (MLJ Journal Spotlight)

### Top Reviewer

ICML'24, NeurIPS'24

### Certificates

SAS Viya Machine Learning Specialist  
SAS Visual Business Analyst  
SAS Base Programmer

## Programming

### Python

e.g. torch, scikit-learn, numpy, scipy,  
pandas, matplotlib...

### SQL

**SAS Base**  
**JavaScript**

## Personal

**Voluntary Trainer | 11/2011 - 08/2016**  
TuS Lichterfelde e.V.

# Fabian Fumagalli (he/him)

## Academic Research

### SHAP-IQ: Uncovering Interactions for Explainable AI

#### Computing Feature Interactions with Shapley Interactions

- for vision transformer and language models
- model-agnostic for any deep learning model
- for tabular data and models, e.g. XGBoost and LightGBM

#### Interactions and Benchmarking across Applications

- e.g. data valuation, LLM prompting, uncertainty quantification

#### Selected Publications

- shapiq: Shapley Interactions in Machine Learning, **NeurIPS 2024**
- KernelSHAP-IQ: Weighted Least Square Optimization for Shapley Interactions, **ICML 2024**
- Beyond TreeSHAP: Efficient Computation of any-order Shapley Interactions for Tree Ensembles, **AAAI 2024**
- SHAP-IQ: Unified Approximation of any-order Shapley Interactions **NeurIPS 2023**

### Incremental XAI: Efficient Explanations in Dynamic Environments

#### Computing Feature Attributions on Evolving Data Streams

- for models that adapt incrementally on distribution shifts
- applicable for sensor networks, financial models, and IoT

#### Selected Publications

- Incremental Permutation Feature Importance (iPFI): Towards Online Explanations on Data Streams, **Machine Learning Journal**
- iSAGE: An Incremental Version of SAGE for Online Explanation on Data Streams, **ECML PKDD 2023**
- iPDP: On Partial Dependence Plots in Dynamic Modeling Scenarios, **xAI 2023**

## Open Source Projects

### shapiq (python)

- SHAP Interaction Quantification
- Shapley Interactions for 11 ML Domains



#### Links

- [GitHub](#)
- [PyPi](#)
- [Docs](#)
- [Blog post](#)

## Work Experience

### PhD Candidate in Explainable AI | 10/2021 - now

Bielefeld University | AG Machine Learning

### SAS & Data Science Consultant | 10/2018 - 10/2021

CBTW (former PTC, mayato)

- international project and client responsibility
- high-performance cloud solutions
- optimization and modeling regulatory processes for banking

### Student Data Scientist | 10/2017 - 10/2018

CBTW (former PTC, mayato)

### Data Scientist Intern | 01/2017 - 06/2017

Munich Re

- machine learning for health insurance

### Teaching Assistant | 10/2014 - 10/2016

Freie Universität Berlin

## Education

### Mathematics M.Sc. | 10/2015 - 10/2018

Technische Universität Berlin

- stochastics, financial mathematics, mathematical deep learning

### Mathematics B.Sc. | 10/2012 - 11/2015

Freie Universität Berlin

### Statistics (ERASMUS+) | 08/2016 - 12/2016

Norwegian University of Science and Technology