





Contact me  

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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

### Distinguished Reviewer

ICML'24, NeurIPS'24

### Best Paper Award

XAI'23

ECML'23 (MLJ Journal Spotlight)

### 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

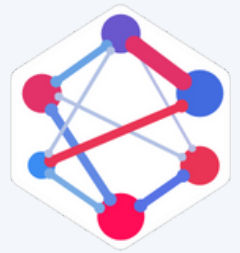
Passionate about Understanding Machine Learning

## 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



**SHAP-IQ**  
[URL](#)

#### Interactions and Benchmarking across Applications

- e.g. Data Valuation, LLM Prompting, Uncertainty Quantification

#### Selected Publications

- shapiq: Shapley Interactions in Machine Learning, **NeurIPS 2024** ([blog.post](#))
- 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
- 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**

## 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

### 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