# Christoph Hofer

PostDoc, machine learning researcher


## contact

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https://c-hofer.github.io/


## languages

german (native)
english (fluent)
french (basic)

## programming

Python,
C++, CUDA, C
C#, SQL

## ai

deep learning,
computer vision,
graph classification,
topological data analysis

## tools

pytorch, sklearn,
pandas, jupyter, SciPy

## productivity

Linux, VsCode, git, gitHub,
latex

## math

algebraic topology,
general topology,
measure theory,
probability theory

## timeline

| | | |
|---|---|---|
| 2007–2014 | **Masters** of Science **in Mathematics** | University of Salzburg |
| 2014–2015 | **Software engineer** and **data scientist** | COPA-DATA group |
| 2015–2020 | **PhD** in **Computer Science** | University of Salzburg |
| 2020 – | **PostDoc**<br>FWF grant Deep Homological Learning | University of Salzburg |

## about me

Curious mind drawn to the the field of artificial intelligence. My inherent motivation goes beyond increasing performance in a particular application but is understanding the hidden mechanics behind artificial learning to allow for more understandable and reliable AI systems. Passionate engineer with 5+ years of experience in data science and development. Open source and python enthusiast with an urge for speed via C++ and CUDA.

## interests

**professional:** machine learning, mathematics, software development, software architecture, algorithms
**personal:** rock climbing, hiking, gaming, running, camping

## projects

**Zenon Analyzer**. Real time reporting software for scada systems. Developed by COPA-DATA group.

**torchph**. Extension package for pytorch. This package is a product of my doctoral studies and, as a highlight, contains the first differentiable GPU implementation of the persistent homology algorithm.

## publications

| | | |
|---|---|---|
| ISBI'17 | Simple domain adaptation for cross-dataset analyses of brain MRI data | oral |
| IPMI'17 | Constructing Shape Spaces from a Topological Perspective | oral |
| NeurIPS'17 | Deep Learning with Topological Signatures | poster |
| ICML'19 | Connectivity-optimized representation learning via persistent homology Learning | poster |
| JMLR'19 | Learning Representations of Persistence Barcodes | |

## preprints

| | | |
|---|---|---|
| ArXiv | Graph Filtration Learning | poster |
| ArXiv | Topologically Densified Distributions | poster |

## awards & grants

| | |
|---|---|
| IPMI'17 | Travel grant |
| NeurIPS'17 | Travel grant |
| ICML'17 | Travel grant |
| ICML'19 | Top 5% reviewer |