

Lukas Klein

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Work Experience

École Polytechnique Fédérale de Lausanne (EPFL)

06/2025 – Today

Postgraduate Researcher – In the AI for Molecular Medicine Group of Prof. Bunne.

- Collaborator in the National AI Initiative for Precision Oncology Innosuisse Flagship Grant

University Hospital Zürich (USZ)

06/2025 – Today

Postgraduate Researcher – In the Experimental Oncology Lab of Prof. Wicki.

German Cancer Research Center (DKFZ)

08/2021 – 06/2025

Graduate Researcher - Supervised by Dr. Jäger (Google DeepMind) and Prof. Maier-Hein (DKFZ).

Eidgenössische Technische Hochschule (ETH) Zürich

02/2021 – 08/2021

Research Intern - Institute for Machine Learning supervised by Prof. Buhmann.

Camelot ITLab

01/2019 – 08/2019

IT Consultant - Machine Learning and cloud solutions in the pharma and chemical industry.

Camelot ITLab

01/2018 – 01/2019

Thesis and Working Student - Bachelor Thesis and Data Science consulting.

Microsoft

06/2017 – 09/2017

Intern - National Technology Office supervised by Thomas Langkabel.

Education

Eidgenössische Technische Hochschule (ETH) Zürich

2021 – 2025

Ph.D. in Computer Science – Supervised by Prof. Buhmann, Prof. Krause, and Dr. Jäger.

- External group member in the IVIA Lab of Prof. El-Assady.
- Collaboration with the MIT-IBM Watson AI Lab supervised by Dr. Strobel.

Helmholtz International Graduate School for Cancer Research

2021 – 2025

DKFZ International Scholarship Award - Acceptance rate of 2.7% in 2022.

- Completed the DKFZ International PhD Program for Cancer Research.

University of Oxford

2022

OxML Summer School for Machine Learning in Healthcare.

University of Geneva

2019 – 2021

M.Sc. in Statistics – Final grade: Very Good. Master Thesis and Exchange Semesters at ETH Zürich.

University of Mannheim

2015 – 2018

B.Sc. in Economics - Final grade: Good. Exchange Semesters at the Norwegian School of Economics.

Languages & Skills

Languages: German (Native), English (Fluent), French (Basic)

Programming Languages: Python, R, Bash, Git, LaTeX, SQL, Julia

Libraries: PyTorch, Lightning, Hydra, Numpy, SciKit, Transformers, XGBoost, JAX, Lme4, Tidyverse

Software & Platforms: Linux (Ubuntu, CentOS, Debian), GitHub/GitLab, IBM Spectrum LSF, Docker, Kubernetes, RunAI, QuPath, Weights & Biases, Nvidia Jetson IoT Platform, CMake, Azure (ML Studio, OpenAI Services), Google Cloud (Cloud Build & Run, Vertex AI), SAP Analytics Cloud, OpenAI API Studio, NCI Genomic Data Commons & TCGA

Voluntary

- 2022 – 2025 **Advisory Committee of the Oxford ML Summer School**
AI for Global Goals.
- 2022 – Today **Invited Talks and Seminars**
TU Munich, DESY, HIDA Graduate School, HIDSS4Health Graduate School, IBM Zürich, MIT-IBM Watson AI Lab, Harvard University, MIT, Tufts University.
- 2022 – Today **Teaching**
Advanced Topics in Machine Learning (ETH Zürich), Biomedical Imaging and Radiation Oncology (University of Heidelberg).
- 2022 – 2023 **Conference Reviewer**
NeurIPS (Conference and Workshops), ICLR (Conference and Workshops), ICML, EuroVis.
- 2016 – 2017 **Speaker for Public Relations**
AStA (Student Council) at the University of Mannheim.
- 2015 – 2016 **Member of the Student Parliament and Deputy Member of the Information Committee**
University of Mannheim. Representative for Refugee Projects.

Publications

Google Scholar: <https://scholar.google.com/citations?user=sxpuZq4AAAAJ>

- 2025 **Explainable AI-based analysis of human pancreas sections identifies traits of type 2 diabetes**
Lukas Klein, Sebastian Ziegler, Yanni Morgenroth, Eyke Schoeniger, Michele Solimena, Felicia Gerst, Robert Wagner, Fabian Isensee, Klaus Maier-Hein, Paul Jäger. *Venue: Under review at Nature Communications.*
- 2025 **nnActive: A Framework for Evaluation of Active Learning in 3D Biomedical Segmentation**
Carsten T. Lüth, Jeremias Traub, Kim-Celine Kahl, Till J. Bungert, Lukas Klein, Lars Krämer, Paul F Jaeger, Fabian Isensee, Klaus Maier-Hein. *Venue: Under review at TMLR.*
- 2025 **Finally Beating the Random Baseline: A Simple and Effective Active Learning Method for 3D Biomedical Segmentation**
Carsten T. Lüth, Jeremias Traub, Kim-Celine Kahl, Till J. Bungert, Lukas Klein, Lars Krämer, Paul F Jaeger, Klaus Maier-Hein, Fabian Isensee. *Venue: Under review at NeurIPS 2025.*
- 2024 **Why context matters in VQA & Reasoning: Semantic interventions for VLM input modalities**
Lukas Klein, Kenza Amara, Carsten Lüth, Antonio Rodríguez, Hendrik Strobelt, Mennatallah El-Assady, Paul Jäger. *Venue: Under review at WACV.*
- 2024 **Navigating the Maze of Explainable AI: A Systematic Approach to Evaluating Methods and Metrics**
Lukas Klein, Carsten Lüth, Udo Schlegel, Till Bungert, Mennatallah El-Assady, Paul Jäger. *Venue: NeurIPS 2024.*
- 2024 **Enhancing predictive imaging biomarker discovery through treatment effect analysis**
Shuhan Xiao, Lukas Klein, Paul Jäger, Jens Petersen, Klaus Maier-Hein. *Venue: WCAV 2025.*
- 2024 **Interactive Semantic Interventions for VLMs: Breaking VLMs with Human Ingenuity**
Lukas Klein, Kenza Amara, Carsten Lüth, Antonio Rodríguez, Hendrik Strobelt, Mennatallah El-Assady, Paul Jäger. *Venue: NeurIPS 2024 Safe Generative AI Workshop and Causality & Large Models Workshop.*
- 2024 **Explainable AI-based analysis of human pancreas sections detects traits of type 2 diabetes**
Lukas Klein, Sebastian Ziegler, Yanni Morgenroth, Eyke Schoeniger, Michele Solimena, Felicia Gerst, Robert Wagner, Fabian Isensee, Klaus Maier-Hein, Paul Jäger. *Venue: NeurIPS 2024 IAI Workshop.*
- 2023 **Discovering Process Dynamic for Scalable Perovskite Solar Cell Manufacturing with Explainable AI**
Lukas Klein, Sebastian Ziegler, Felix Laufer, Charlotte Debus, Markus Götz, Klaus Maier-Hein, Ulrich W. Paetzold, Fabian Isensee, Paul Jäger. *Journal: Advanced Materials (IF: 30). This work has been covered i.a. by [The Independent](#).*
- 2023 **Understanding Solar Cell Manufacturing with Explainable AI**
Lukas Klein, Sebastian Ziegler, Felix Laufer, Charlotte Debus, Markus Götz, Klaus Maier-Hein, Ulrich W. Paetzold, Fabian Isensee, Paul Jäger. *Venue: NeurIPS 2023 Workshop on XAI in Action (Oral, Top 3 Paper).*
- 2023 **Navigating the Pitfalls of Active Learning Evaluation: A Systematic Framework for Assessment**
Carsten T. Lüth, Till J. Bungert, Lukas Klein, Paul Jäger. *Venue: NeurIPS 2023.*
- 2023 **Semi-supervised automated Gleason Grading on WSI**
Maximilian Fischer, Lars Krämer, Sebastian Ziegler, Lukas Klein, Paul Jäger, Marco Nolden, Peter Neher, Fabian Isensee, Klaus Maier-Hein. *Venue: ECDP 2024 (Oral).*
- 2023 **A Call to Reflect on Evaluation Practices for Failure Detection in Image Classification**
Paul Jäger, Carsten T. Lüth, Lukas Klein, Till J. Bungert. *Venue: ICLR 2023 (Oral, Top 1% Paper).*

- 2022 **From Correlation to Causation: Formalizing Interpretable Machine Learning as a Statistical Process**
Lukas Klein, Mennatallah El-Assady, Paul Jäger. *Venue: IJCAI 2022 Workshop on XAI.*
- 2022 **Improving Explainability of Disentangled Representations using Multipath-Attribution Mappings**
Lukas Klein, João Carvalho, Mennatallah El-Assady, Paolo Penna, Joachim M. Buhmann, Paul Jäger. *Venue: MIDL 2022.*

References

Prof. em. Joachim Buhmann

Professor at ETH Zürich leading the ISE
Group. jbuhmann@inf.ethz.ch

Dr. Paul Jäger

Google DeepMind Senior Researcher.
p.jaeger@dkfz-heidelberg.de

Prof. Mennatallah El-Assady

Professor at ETH Zürich leading the IVIA
Lab. menna.elassady@ai.ethz.ch