Yannick Metz

PhD Student and Research Associate Computer Science

PhD Candidate and Research Associate at the Chair for Data Analysis and Visualization of Prof. Daniel Keim at the University of Konstanz. Associated member of the Interactive Visualization & Intelligence Augmentation Lab of Prof. Mennatallah El-Assady at ETH Zurich. MS (2021) and BS (2019) in Computer Science at University of Konstanz. Interested in reliable, interpretable machine learning for human-AI interaction.

Education

Research Associate with goal of Promotion, 05/2021 – now
University of Konstanz, Germany

MS Studies in Computer Science, 10/2019 – 03/2021, grade: 1.0
University of Konstanz, Germany

BS Studies in Computer Science, 10/2014 – 09/2019, graduation with grade: 1.6
University of Konstanz, Germany

Study abroad, focus in machine learning and artificial intelligence, 08/16-01/17
Uppsala University, Sweden

Formal education, 2005 – 2013, graduation with grade: 1.6
Friedrich-Hecker-Gymnasium, Radolfzell, Germany

Technical Knowledge

Languages:	Python, JavaScript, C++, HTML, CUDA, C#, SQL, Java
Development Environments:	Experienced with ML Frameworks (PyTorch, TensorFlow, Sci-Kit), Data Visualization Toolkits (d3.js), Web Programming (Server + Frontend)
Additional Knowledge:	Distributed Computing (Docker, Ray), 3D-Engines (Unity/ PyBullet)

Work Experience

Research Associate, University of Konstanz, 05/2021 – now

Academic work in various roles, teaching, work as part of multiple DFG and EU projects, technical and conceptual work, achievement of multiple publications as first- and co-author, specialization on deep learning, in particular deep reinforcement learning and human-AI cooperation

Working Student, Airbus Defence & Space, 08/2017-01/2017 & 11/2018-03/2020
Work supporting internal and contract research. Main topics included a Pilot Study in Deep Reinforcement Learning, e.g. for navigation and collision avoidance, Deep image processing (segmentation, image-to-image translation), and automated collection and analysis of experiment results. Responsibilities were Programming work in Python (TensorFlow, StableBaselines, Flask), Integration of distributed computing systems (MPI, Ray, Microsoft HPC) and architecture work (system administration), Use and Modification of 3D-Simulation environments (Unity), and Writing of Study and State-of-the-Art-Research Reports.

Research Assistant, University of Konstanz, 02/2018-08/2018
Research Assistant (HiWi) at the Chair of Data Analysis and Visualization, Implementation & programming of an interactive web-based visual analytics application to display logistics and delivery infrastructure, Cooperation with Siemens via Steinbeis

Projects and Personal Accomplishments

Imitation Learning for Swarm Behavior, Master's Thesis
Exploration of architectures and training setup for deep neural networks with goal to imitate single agents in a fish swarm. Introduction of a novel transformer-based architecture. Work included the creation of a sophisticated framework for training, supervision and evaluation of trained agents.

Exploration of multiple Interpretability Methods in Deep Learning-based Image Classification, Bachelor's Thesis
Implementation of an interactive visual-analytics tool for the application and comparison of different gradient-based interpretability and attribution methods in image classification. Custom visualizations for novel interpretability method TCAV.

Honorable Mention at the VAST Challenge 2018: Interactive Analytics Tool
Implementation of a visual-analytics tool to examine spatio-temporal patterns of bird migration, Bird Species classification from audio via machine-learning, certificate in supplemental material

Top-10 Finish (Creative Track) at the ACM RecSys Challenge 2018: Music Playlist continuation based on a large real-world dataset
Exploration of methods in collaborative filtering (e.g. matrix factorization), implemented approach combining custom graph-based/nearest neighbour approach, matrix factorization and deep neural network for submission, Code: https://github.com/fyrelab/Spotify-RecSys

Fyrelab sentry, Software Development Project, University of Konstanz

Development of a Linux-based, open-source home surveillance software for systems like the Raspberry Pi, Use of a C++ back-end, JavaScript server and web-technologies for interface, Code: https://github.com/orgs/fyrelab/teams/sentri

Additional projects:

- - **Neural Style Transfer, Investigation and Implementation of Neural Style Transfer, Term Course Project, Machine Learning, Uppsala University, 2017**
  5 credit course project, Investigation of neural style transfer methods (Gatys Et al. 2015), Lua Torch, CNNs, Deep Learning, perceptual loss functions
- - **Prediction of Cancer Survival Rates with Machine Learning, Course Project, Data Mining I, Uppsala University, 2016**
  Based on tabular medical records/examination results from SEER cancer dataset
- - **Participation in the Abstraction and Reasoning Challenge, Kaggle 2020**
  Study of state-of-the-art research exploring machine learning for reasoning, causality and sequential decision making. Implementation of a reinforcement learning-based solution

  Public GitHub Repositories: https://github.com/ymetz, https://github.com/fyrelab

Peer-Reviewed Publications

RLHF-Blender: A Configurable Interactive Interface for Learning from Diverse Human Feedback, 2023
Authors: Yannick Metz, David Lindner, Raphaël Baur, Daniel A Keim, Mennatallah El-Assady

VISITOR: Visual Interactive State Sequence Exploration for Reinforcement Learning, 2023
Authors: Yannick Metz, Eugene Bykovets, Lucas Joos, Daniel Keim, Mennatalah El-Assady

A Comprehensive Workflow for Effective Imitation and Reinforcement Learning with Visual Analytics, 2022
Authors: Yannick Metz, Udo Schlegel, BMennatallah El- Assady, Daniel Seebacher, Daniel Keim

BARReL: Bottleneck Attention for Adversarial Robustness in Vision-Based Reinforcement Learning, 2022
Authors: Eugene Bykovets*, Yannick Metz*, Mennatallah El-Assady, Daniel A Keim, Joachim M Buhmann (*equal contribution)

A text and image analysis workflow using citizen science data to extract relevant social media records: Combining red kite observations from

Flickr, eBird and iNaturalist, 2022
Authors: Maximilian C. Hartmann, MoritzSchott, Alishiba Dsouza, Yannick Metz, Michele Volpie, Ross S. Purves

Task-based Visual Interactive Modeling: Decision Trees and Rule-based Classifiers, 2021
Authors: Dirk Streeb, Yannick Metz, Udo Schlegel, Bruno Schneider, Mennatallah El- Assady, Hansjorg Neth, Min Chen, Daniel Keim

Volunteering

Voluntary work at Food bank, Singener Tafel e.V., Germany, 02/2014-09/2014

Done full time as part of the German social volunteering program BFD ("Bundesfreiwilligendienst"), personal growth and improvement of communication skills