

## Profile

- Born 1995 in Lienz, Austria
- Postdoctoral researcher at VASCage - Centre on Clinical Stroke Research
- Currently residing in Innsbruck, Austria

## Academic Education

- 2014–2017 **Bachelor of Science**, *Technical Mathematics*, Universität Innsbruck,  
BSc thesis: *Neural Networks with Application to Galaxy Classification*  
Exploring neural networks and their application to multi-label classification of galaxy Hubble-types. Implementing neural network architectures, training strategies and backpropagation algorithm from scratch (Python).
- 2017–2019 **Master of Science**, *Technical Mathematics*, Universität Innsbruck,  
MSc thesis: *Deep Learning in Data Annotation: Projection-based 2.5 U-Net Structure for Fast Volumetric Segmentation*  
Investigation and development of projection-based models for supervised and fully-automated image segmentation with deep convolutional neural networks (Python, TensorFlow). Implementation of novel network architectures for fast and memory-efficient annotation of 3D biomedical data (itk-SNAP).
- 2019–2023 **Doctor of Philosophy**, *Mathematics*, Universität Innsbruck,  
PhD thesis: *Generative Networks for Self-Supervised Modality Transfer and Uncertainty Quantification*  
Investigation and development of deep learning based transfer models for domain translation in a fully unsupervised manner (Python, TensorFlow). Exploration of Bayesian neural networks and their application to unsupervised computer vision tasks (PyTorch). Incorporating data-dependent uncertainty into (self-)supervised frameworks.
- 2019–2023 **Master of Data Science**, *Continuing education program*, Universität Innsbruck,  
MDs thesis: *HEATWEX - Modeling Socioeconomic Heat Events in Austria*  
Statistical analysis of large time series databases in order to investigate correlations between socioeconomic heat events and renowned measures of heat/drought (InfluxDB, R).

## Professional Experience

- Oct 2018 – Dec 2022 – **Scientific Researcher**, *full time*, Universität Innsbruck, Austria
- Jun 2022 – Jul 2023 – **Scientific Researcher**, *part time*, VASCage - Centre on Clinical Stroke Research, Austria
- Aug 2023 – **Postdoctoral Researcher**, *full time*, VASCage - Centre on Clinical Stroke Research, Austria

## Machine Learning Expertise

- **Deep Learning**  
supervised learning, unsupervised learning, neural networks, convolutional neural networks, recurrent neural networks, generative adversarial networks, StyleGAN, diffusion models, Bayesian networks
- **Applications**  
computer vision, life sciences, signal and image processing, segmentation, modality transfer, generative AI, uncertainty quantification
- **Programming**  
Python, PyTorch, TensorFlow, SciPy, NumPy, pandas, scikit-learn, R, InfluxDB, MySQL, Docker, GitHub

## Essential Skills

- German & English fluently
- Supervision of master students
- Experienced in project coordination and team work
- Fast understanding and implementation of latest developments in the area of machine learning
- LaTeX & MsOffice

## List of Publications (First Author):

- **Projection-Based 2.5D U-net Architecture for Fast Volumetric Segmentation**  
International conference on Sampling Theory and Applications (SampTA)  
<https://ieeexplore.ieee.org/abstract/document/9030861>, 2019
- **Random 2.5D U-net for Fully 3D Segmentation**  
Machine Learning and Medical Engineering for Cardiovascular Health and Intravascular Imaging and Computer Assisted Stenting (MICCAI Workshops)  
[https://link.springer.com/chapter/10.1007/978-3-030-33327-0\\_19](https://link.springer.com/chapter/10.1007/978-3-030-33327-0_19), 2019
- **Deep structure learning using feature extraction in trained projection space**  
Computers & Electrical Engineering  
<https://sciencedirect.com/science/article/pii/S004579062100104X>, 2021
- **Unsupervised Joint Image Transfer and Uncertainty Quantification Using Patch Invariant Networks**  
ECCV 2022 Workshops  
[https://link.springer.com/chapter/10.1007/978-3-031-25085-9\\_4](https://link.springer.com/chapter/10.1007/978-3-031-25085-9_4), 2023

- **Deep Generative Networks for Nondestructive Cylinder Liner Inspection in Large Internal Combustion Engines**  
WCX SAE World Congress Experience  
<https://www.sae.org/publications/technical-papers/content/2023-01-0066/>, 2023
- **Surface topography characterization using a simple optical device and artificial neural networks**  
Engineering Applications of Artificial Intelligence  
<https://www.sciencedirect.com/science/article/pii/S0952197623005213>, 2023
- **Unsupervised single-shot depth estimation using perceptual reconstruction**  
Machine Vision and Applications  
<https://link.springer.com/article/10.1007/s00138-023-01410-5>, 2023

## Internships

- Summer 2015 **Kärntner Sparkasse**, Winklarn, Austria  
Summer internship at a financial institute.
- Summer 2018 **Liebherr Hausgeräte GmbH**, Lienz, Austria  
Data analyses of large data sets storing production defects in the manufacture of household appliances (MySQL, R). Building models for the real-time prediction of manufacturing errors caused by machines and humans using recurrent neural networks (Python, TensorFlow).

## Interests

- Sports mountaineering, skiing, biking
- Music Brassband Fröschl Hall, edelBlech, national and international music projects

## Special Efforts

- Merit-based scholarship of Universität Innsbruck in 2017 & 2018
- First place at the *LEC Data Challenge 2021* (<https://www.lec.at/news-entries/lec-data-challenge-sieger-2021/?lang=en>)
- First place at the *Medical Out-of-Distribution Analysis Challenge (MOOD) 2022* (<http://medicalood.dkfz.de/web/2022/>)