

EDUCATION

- **Max Planck Institute for Biological Cybernetics** Germany, Oct 2019-now
Ph.D. researcher, Advisors: Prof. Dr. Klaus Scheffler, PD. Dr. Gabriele Lohmann
- **Eberhard Karl Universität Tübingen** Germany, Oct 2019-now
Ph.D. Candidate, Graduate Training Center of Neuroscience
- **Hong Kong Polytechnique University** Hong Kong, Sep 2017-Mar 2019
MSc., Mechanical Engineering in Aeronautical Engineering GPA: 3.0/4.0
- **Qing Hai University** China, Sep 2013-June 2017
BSc., Mechanical Engineering GPA: 3.7/4.0

TECHNICAL SKILLS AND INTERESTS

Languages: Chinese(Native), Cantonese(Fluent), English(Fluent), German(Basic)

Developer Tools: C/C++, Python, Matlab, Rust, Julia, VIM, Git, L^AT_EX

Frameworks: PyTorch, JAX, Caffe, distributed training

Areas of Interest: Generative models, stability of GAN, Score-matching models, Computational fluid dynamics, Optimal transport, Graph neural networks

PROJECTS

- **Schrödinger bridge matching for high-dimensional generative model(Deep Learning)** 2023
Advance diffusion model by solving Schrödinger bridge problem, first time applied to the context of 2D and 3D models
- **Brain MRI surface rendering from volume using implicit neural representation (Deep Learning)** 2023
Render brain surface from MRI volumes without using ground truth mesh in training
 - Implicit representation used for rendering the surface of the brain MRI
 - Training without paired mesh ground truth, which is required in other works
- **Stable GAN training for super-resolution on volumetric MRI data (Deep Learning)** 2021
We use super-resolution strategy to generate high-resolution MRI volumes, with the most indistinguishable details
 - Stability in GAN dynamics, efficient convergence with small training sample size
 - Our GAN model achieved best perceptual quality in both spatial and frequency domain, with a frequency-informed discriminator
 - The best generalizability in OOD data than any other SR models for medical images
- **Flexible segmentation network for brain MRI on various resolutions (Deep Learning)** 2021
A neural network model, trained on 3T MRI data using domain adaption, to segment 9.4T MRI data
 - SOTA segmentation accuracy on 9.4T MRI data
 - Benchmarking existing ML based segmentation method as well as traditional segmentation tools for 9.4T MRI data
- **Inductively coupled wireless MR detector for improving focal SNR (Neuroscience)** 2020
A wireless MRI coil with enhanced SNR for animal experiments in 14.1T scanner
 - Developed wireless MR detector that allows flexible experiment design, e.g. concurrently optogenetic recording with MRI under ROI of the coil
 - Analysis of laminar BOLD fMRI signal functional activity in somatosensory cortex
- **Laminar-specific functional connectivity mapping with multi-slice fMRI (Neuroscience)** 2020
Multi-regional line-scanning fMRI paired with optical calcium signal recording, in 14.1T scanner
 - Multi-slice BOLD fMRI is recorded concurrently with local neuronal calcium signal, via an optical fiber
 - Neuro-vascular coupling studied in both task-evoked and spontaneous recording of brain states in rats
- **Automated vision-based micro-surgical task execution through a robotic multi-arm system (Robotics)** 2018
The vision system adopted a segmentation network trained on RGB-D images
- **Computational fluid analysis on indoor ventilation system (Thermodynamics)** 2017
Numerically simulate the temperature and flow stream of the air in a room with one source and one sink

RECENT PUBLICATIONS(→SEE ALL PUBLICATIONS)

Journal & Conference papers

- 1. DISGAN: Wavelet-informed discriminator guides GAN to MRI image Super-resolution with noise cleaning**
ICCV Workshop on Computer Vision for Automated Medical Diagnosis 2023 2023
Wang, Q.; Mahler, L.; Steiglechner, J.; Birk, F.; Scheffler, K.; Lohmann, G.
- 2. A Three-Player GAN for Super-Resolution in Magnetic Resonance Imaging**
MICCAI Workshop on Machine Learning for Clinical Neuroimaging 2023 2023
Wang, Q.; Mahler, L.; Steiglechner, J.; Birk, F.; Scheffler, K.; Lohmann, G.
- 3. Pretraining is All You Need: A Multi-Atlas Enhanced Transformer Framework for Autism Spectrum Disorder Classification**
MICCAI Workshop on Machine Learning for Clinical Neuroimaging 2023 2023
Mahler, L.; Wang, Q.; Steiglechner, J.; Birk, F.; Heczko, S.; Scheffler, K.; Lohmann, G.
- 4. Super resolution for ultra-high fields MR images augmentation improving 9T MR image segmentation**
Medical Imaging with Deep Learning(MIDL) 2022, Zürich 2022
Wang, Q.; Steiglechner, J.; Scheffler, K.; Lohmann, G.
- 5. Focal fMRI signal enhancement with implantable inductively coupled detectors**
NeuroImage 2022
Chen, Y.; Wang, Q.; Choi, S.; Zeng, H.; Takahashi, K.; Qian, C.; Yu, X. Joint first author

Abstracts & Posters

- 1. JudgeMI: Towards Accurate Metrics for Assessing Deep Learning Based Structural MRI Motion Correction**
29th Annual Meeting of the Organization for Human Brain Mapping (OHBM 2023), Montreal 2023
Mahler, L.; Steiglechner, J.; Wang, Q.; Scheffler, K.; Lohmann, G.
- 2. Super Resolution Improves Cortical Segmentation Accuracy in Ultra-high Resolution MRI**
28th Annual Meeting of the Organization for Human Brain Mapping (OHBM 2022), Glasgow 2022
Wang, Q.; Steiglechner, J.; Scheffler, K.; Lohmann, G.
- 3. Synthetic 9T-like structural MRI using Generative Neural Network**
22nd Conference of Junior Neuroscientists (NeNa 2021), Tübingen 2021
Wang, Q.; Steiglechner, J.; Lohmann, G.
- 4. Inductively coupled detectors for optogenetic-driven focal and multiregional fMRI signal enhancement**
ISMRM & SMRT Annual Meeting & Exhibition (ISMRM 2021), Virtual 2021
Chen, Y.; Wang, Q.; Choi, S.; Zeng, H.; Takahashi, K.; Qian, C.; Yu, X. Oral, Summa cum laude award

TALKS

- 1. Deep learning for MRI super resolution and its applications**
AI meets MRI seminar April, 2022
Max Planck Institute for Intelligence System Tübingen, Germany
- 2. Super Resolution Improves Cortical Segmentation Accuracy in Ultra-high Resolution MRI**
28th Annual Meeting of the Organization for Human Brain Mapping June, 2022
OHBM conference Glasgow, UK
- 3. Synthetic 9T-like structural MRI using Generative Neural Network**
22nd Conference of Junior Neuroscientists (NeNa 2021) September, 2021
Eberhard Karl Universität Tübingen Tübingen, Germany

PROFESSIONAL SERVICE

- Reviewer for **NeuroImage** journal, 2022