HAN ZHANG

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han10th.github.io

EDUCATION

City University of Hong Kong, Hong Kong *Ongoing*
Department of Mathematics Ph.D. in Mathematics
Chinese University of Hong Kong, Hong Kong *July 2020*
Department of Mathematics M.Phil. in Applied Mathematics
Sun Yat-Sen University, Guangzhou *June 2018*
School of Mathematics B.Sc. in Computational Science

RESEARCH INTEREST

Computational Fluid Mechanics: Fluid-Structure Interaction, Blood flow simulation
Computational Differential Geometry: Geometric Deep Learning, Deformable Model
Scientific Machine Learning: PINN method, Neural Networks
Image Science: Image Segmentation, Interactive Segmentation

JOURNAL PUBLICATIONS

1. Fluid Dynamics and Domain Reconstruction from Noisy Flow Images Using Physics-Informed Neural Networks and Quasi-Conformal Mapping.
Han Zhang$^{\mathsf{T}}$, Xue-Cheng Tai, Jean-Michel Morel, Raymond H. Chan
Submitted to *SIAM Journal of Imaging Science (SIIS).*
[AI4PDE project]

2. Circular Image Deturbulence using Quasi-conformal Geometry.
Chu Chen, **Han Zhang**, Lok Ming Lui$^{\mathsf{T}}$
Submitted to *Neural Network (NN)*
[Geometric Image project]

3. Quasi-Conformal Convolution: A General Geometric Convolution Neural Network on Manifold Learning.
Han Zhang, Tsz Lok Ip, Lok Ming Lui$^{\mathsf{T}}$
Submitted to *SIAM Journal of Imaging Science (SIIS).*
[Geometric Image project]

4. Parametrized Sampling for 3D Blood Simulation in Deformable Vessels Using Physics-Informed Neural Networks.
Han Zhang, Lingfeng Li, Xue-Cheng Tai$^{\mathsf{T}}$, Raymond H. Chan
Submitted to *Journal of Computational and Applied Mathematics (JCAM).*
[AI4PDE project]

5. Deformation-Invariant Neural Network and Its Applications on Image Classification and Restoration.
Han Zhang, Qiguang Chen, Lok Ming Lui$^{\mathsf{T}}$
Accepted by *Neural Network (NEU NET), 2025.*
[Geometric Image project]

6. Full 3D Blood Flow Simulation in Curved Deformable Vessels Using Conditional Physics-Informed Neural Networks.

Han Zhang, Xue-Cheng Tai$^{\mathsf{T}}$
Accepted by *Acta Mathematica Universitatis Comenianae (AMUC), 2024.*
[AI4PDE project]

7. QIS : Interactive Segmentation via Quasi-Conformal Mappings.
Han Zhang, Daoping Zhang, Lok Ming Lui$^{\mathsf{T}}$
Accepted by *SIAM Journal of Imaging Science (SIIS), 2024.*
[Geometric Image project]

8. A Meshless Solver for Blood Flow Simulations in Elastic Vessels Using Physics-Informed Neural Network.
Han Zhang, Raymond H. Chan, Xue-Cheng Tai$^{\mathsf{T}}$
Accepted by *SIAM Journal of Scientific Computing (SISC), 2024.*
[AI4PDE project]

9. A Learning-based Framework for Topology-Preserving Segmentation using Quasiconformal Mappings.
Han Zhang, Lok Ming Lui$^{\mathsf{T}}$
Accepted by *Neurocomputing (NEUCOMP), 2024.*
[Geometric Image project]

10. Continuous Aerial Path Planning for 3D Urban Scene Reconstruction.
Han Zhang, Yucong Yao, Ke Xie, Chi-Wing Fu, Hao Zhang, Hui Huang$^{\mathsf{T}}$.
Accepted by *ACM Transaction on Computer Graphics (ACM TOG, SIGGRAPH ASIA), 2021.*
[Graphics]

PROCEEDING PUBLICATIONS

1. Accelarating Physics-Informed Learning Through Parameter Prediction Using HyperDiffusion.
Yuzhou Zhao, **Han Zhang**, J. Matias Di Martino, Jean-Michel Morel, Guillermo Sapiro
In progress
[AI4PDE project]

2. Nondeterministic Deformation analysis using Quasiconformal Geometry.
Han Zhang, Lok Ming Lui$^{\mathsf{T}}$
Accepted by *IEEE International Conference on Image Processing (ICIP), 2022.*
[Geometric Image project]

ACADEMIC ACHIEVEMENTS

Outstanding Academic Performance Award, 2024
Excellent Student Scholarship of Sun Yat-Sen University, 2017 *First Class*
Excellent Thesis of Sun Yat-Sen University, 2018 *Outstanding*
China Undergraduate Mathematical Contest in Modeling, 2016 *Second Prize*
National High School Mathematics League, 2012 *Second Prize*

REVIEW

Computer Graphics Forum (EuroGraphics)
Neural Networks