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
Supervised by Raymond H. CHAN,
co-supervised by Xue-Cheng TAI and Jean-Michel Morel

Chinese University of Hong Kong, Hong Kong *July 2020*
Department of Mathematics M.Phil. in Mathematics
Supervised by Lok Ming LUI

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

VISITING SCHOLAR

Princeton University: Hosted by Prof. Guillermo Sapiro. *Sep. — Oct. 2025*
Emory University : Hosted by Prof. Yuanzhe Xi. *Oct. 2025*

JOURNAL PUBLICATIONS

$^{\mathsf{T}}$denotes the corresponding author.
*denotes the equal contribution.

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. Fast Physics-Informed Learning via Diffusion Hypernetworks.
   Yuzhou Zhao, **Han Zhang**$^{\mathsf{T}}$, J. Matias Di Martino, Jean-Michel Morel, Guillermo Sapiro
   Submitted
   [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*

INVITED TALKS

1. [**1-hour Invited Talk**] Physics-Informed Neural Network for Blood Flow Simulation : Forward and Inverse Problem
   Emory University - CODES Seminar, Atlanta, USA *Oct. 2025*

REVIEW

1. Neural Networks
2. Neurocomputing
3. Medical Image Analysis
4. Computer Graphics Forum

TEACHING EXPERIENCE

* denotes courses with duty of a weekly one-hour instructional session.

City University of Hong Kong

1. MA1200 Calculus & Basic Linear Algebra I* *Spring, 2025*
2. MA1201 Calculus & Basic Linear Algebra II* *Spring, 2025*
3. MA2177 Engineering Mathematics and Statistics* *Fall, 2024*
4. MA1200 Calculus & Basic Linear Algebra I* *Spring, 2024*
5. MA1200 Calculus & Basic Linear Algebra I* *Fall, 2023*
6. GE1359/MA1502 Algebra *Spring, 2023*

Chinese University of Hong Kong

1. MATH1010 University Mathematics *Spring, 2020*
2. MATH1510B Calculus for Engineers *Fall, 2019*
3. MATH4250 Game Theory *Spring, 2019*
4. MATH1510B Calculus for Engineers *Fall, 2018*