Hui Zhang (Ms.) 张慧

Ph.D. Candidate | The University of Hong Kong

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My research interests include Computer graphics and vision, Visualization, Digital fabrication, Machine learning, Computer aided material design, medical image processing, 3D shape modeling.

Education

2015.09 – 2020.07	**The University of Hong Kong** Ph.D. in Computer Graphics, supervised by Prof. Wenping Wang Research direction : 3D shape modeling, computer vision, deep learning	Hong Kong, China
2012.09 – 2015.06	**University of Science and Technology of China** M.Phil. in Control Science and Engineering, supervised by Prof. Shuang Cong Research direction : Quantum system state estimation and tracking control	China
2008.09 – 2012.06	**Southwest University of Science and Technology** B.Eng. in Automation, GPA : 3.79/4.0, ranking : 2/202 (top 1%)	China

Research Experience

2018.10 – 2019.02 | **The University of Tokyo, HCI for Machine Learning Lab** — Tokyo, Japan
- Research Assistant, working with Dr. Nobuyuki Umetani and Prof. Takeo Igarashi
- Research on 3D shape encoding based on deep neural networks, e.g. GANs, VAE.

2017.06 – 2017.11 | **University of Stuttgart, Visualization Research Centre** — Stuttgart, Germany
- Research Assistant, working with Prof. Thomas Ertl
- Designed a system with 3D bubble segmentation, reconstruction, visualization and 3D shape searching and clustering from porous media dataset

2012.06 – 2012.08 | **Shenzhen Institutes of Advanced Technology, Chinese Academy of Science** — Shenzhen, China
- Visiting student, working at Medical Robotics and Surgical Devices Research Centre
- Conducted research on medical image segmentation

Publications

2020 **Hui Zhang**, Chuan Wang, Nenglun Chen, Jue Wang, Wenping Wang. Skin Texture Generation via Blue-noise Gabor Filtering based Generative Adversarial Network. (*ACM Multimedia 2020*)

2020 **Hui Zhang**, Lei Yang, Runnan Chen, Nenglun Chen and Wenping Wang. Axis-attention-enhanced generative network for the synthesis of 3D micro-structures.(Journal under review 2020)

2019 **Hui Zhang**, Lei Yang, Changjian Li and Wenping Wang. Synthesis of Structurally Complex Materials with Generative adversarial Networks.(*under Journal review*)

2018 **Hui Zhang**, Steffen Frey, Holger Steeb, David Uribe, Thomas Ertl, and Wenping Wang. Visualization of Bubble Formation in Porous Media [J]. *IEEE transactions on visualization and computer graphics, 2019, 25(1) : 1060-1069.* (*Proceeding of IEEE VIS 2018*)

2017 **Hui Zhang**, Weikai Chen, Bin Wang and Wenping Wang. By Example Synthesis of Three-Dimensional Porous Materials [J]. *Computer Aided Geometric Design. Vol.52–53 (2017) : 285–296.*

2016 Kezhi Li, **Hui Zhang**, Shuang Cong. An improved robust ADMM algorithm for quantum state tomography [J]. (*Quantum Information Processing 15.6. (2016) : 2343-2358.*)

- Shuang Cong, **Hui Zhang**. Comparative analysis of quantum state estimation algorithm based on compressive sensing[J]. *Pattern Recognition and Artificial Intelligence 29.2. (2016) : 116-121.*

2015 Shuang Cong, **Hui Zhang**. Dynamic function Tracking Control of Quantum Systems [J]. *Control and Design. Vol. 30 (03) (2015) : 485-489.*

2014 Shuang Cong, **Hui Zhang**, Kezhi Li. An Improved Quantum State Estimation algorithm via Compressive Sensing [C].(*IEEE International Conference on Robotics and Biomimetic. (2014) : p2338-2343.*)

Skills

Programming	C/C++, Python (Pytorch/Tensorflow), Java, Matlab, OpenCV, OpenGL, VTK, D3.js
Languages	English(fluent), Mandarin(native), Cantonese(Basic), German(Beginner)

Honors and Awards

2015-2020	HKU Postgraduate Scholarship
2015	Excellent Graduate student of USTC
2014	China National Scholarship for Graduate Students
2013	Guang Hua Educational Fellowship
2012	Outstanding Graduates Scholarship
2009-2012	First Prize Undergraduate Scholarship

Teaching Experience

2018-2019 **Teaching Assistant, The University of Hong Kong**
- COMP3230 : Principles of Operating Systems

2015-2017 **Teaching Assistant, The University of Hong Kong**
- COMP2123 : Programming Techniques and Tools

2013-2014 **Teaching Assistant, University of Science and Technology of China**
- Postgraduate course : Intelligent System

Projects

Skin Texture Generation via Blue-noise Gabor Filtering based Generative Adversarial Network 2020

ACM Multimedia 2020

Propose a two-branch generative adversarial network combined facial identity enhancing with textures details generation to jointly produce a high-quality facial skin image from low-quality image input. The key behind is to effectively synthesize plausible textured noise for the faces. We propose a novel Blue-Noise Gabor Module to produce a spatial-variant noisy image, which specifically utilize the property of blue noise and Gabor filter to implicitly guide the asymmetrical sampling for the face region as a guidance map.

Python Pytorch

Synthesize 3D micro-structures based on Generative Adversarial Network 2019

Journal 2020 under review TVCG 2019 submitted manuscript

Propose an attention-enhanced 3D generative network for synthesizing complex 3D micro-structures that reproduces the intrinsic distributions of exemplar. It consists of a spatial-spectral-aware encoding sub-network and a generative adversarial sub-network. The designed axial 3D attention module could effectively capture the long-range correlations observed in the exemplar and is incorporated into each sub-net, which enhance the intermediate feature maps.

Python Pytorch

Visualization of Bubble Formation in Porous Media 2018

IEEE VIS 2018 paper Video link

Design a visualization system for the analysis of CO2 bubbles in porous formations. It contains (a) detection and extraction of bubbles in porous structures; (b) morphology-based bubble classification and identification of similar structures for a bubble of interest; (c) clustering of bubbles according to their connectivity to the surrounding structure; (d) registration of bubbles and structures, shown from six different views; (e) integrated visualization of multiple bubbles and structures.

C++ VTK OpenGL OpenCV

By example synthesis of 3D porous shapes 2017

CAGD 2017 paper

3D modelling and synthesis of porous material based on texture synthesis methods, which could preserve structural continuity and maintain visual similarity with exepmlar. Given the 3D exemplar as input, we extend the 2D texture optimization method to 3D cases by using 3D neighborhood. An adaptive weighted mechanism method is proposed to reduce blurring and accelerate the convergence speed. A connectivity pruning algorithm is performed as post-processing to prune spurious branches.

C++ VTK OpenGL