Sicheng Gao

Male – Würzburg – Germany

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Education

University of Würzburg   **Germany**
PhD student, Computer Vision   *01/2024–Present*
Supervised by Prof. Radu Timofte.

National University of Singapore   **Singapore**
Internship Student, Computer Vision and Machine Learning Group   *06/2023–11/2023*
Supervised by Prof. Angela Yao.

Beihang University   **Beijing**
Master's degree, Pattern Recognition and Intelligent Systems   *09/2021–12/2023*
Supervised by Prof. Baochang Zhang.

China Agricultural University   **Beijing**
Bachelor's degree, Agricultural Mechanization and Automation   *09/2017–07/2021*
Second Prize in The Chinese Mathematics Competitions.

Research Interests

Computer Vision and Machine Learning, including Image and Video Restoration and Generation; 3D Scene Rendering; Medical Image Analysis; Network Compression.

Publications

My name is in bold, and # indicates equal contribution.

- **Sicheng, Gao**#, Xuhui, Liu#, Bohan Zeng#, Sheng Xu, Yanjing Li, Xiaoyan, Luo, Jianzhuang, Liu, Xiantong, Zhen, Baochang, Zhang. Implicit Diffusion for Continuous Super-Resolution. (CVPR 2023). paper code
- **Sicheng, Gao**#, Feng, Yutang#, Linlin Yang, Xuhui Liu, Zichen Zhu, David Doermann, Baochang Zhang. MagFormer: Hybrid Video Motion Magnification Transformer from Eulerian and Lagrangian Perspectives. (BMVC 2022). paper
- Bohan, Zeng#, Xuhui, Liu#, **Sicheng, Gao**#, Jianzhuang, Liu, Baochang Zhang. Coarse-to-Fine Face Animation with Diffusion Model. (CVPR Workshop 2023). paper code
- **Sicheng, Gao**, Runqi Wang, Liuyang Jiang, Baochang Zhang. 1-bit WaveNet: Compressing a Generative Neural Network in Speech Recognition with Two Binarized Methods. (ICIEA 2021).
- **Sicheng, Gao**, Xuhui, Liu, Bohan Zeng, Jianzhuang, Liu, Baochang, Zhang. Implicit Diffusion for Continuous Super-Resolution. (IJCV, Submitted).
- Yutang Feng, **Sicheng, Gao**, Baochang, Zhang, Angela Yao. WAVE: Warping DDIM Inversion Features for Zero-shot Text-to-Video Editing. (Submitted).
- **Sicheng, Gao**, Wenting Jin, Baochang Zhang, Xiantong Zhen. Variational Multimodal Learning for Fine-grained Lung Disease Classification. (Submitted).

- Bohan Zeng, Shanglin Li, Xuhui Liu, **Sicheng Gao**, Jianzhuang Liu, Baochang Zhang. Controllable Mind Visual Diffusion Model. (AAAI 2024). arxiv
- Shanglin Li, Bohan Zeng, Yutang Feng, **Sicheng Gao**, Xuhui Liu, Jianzhuang Liu, Baochang Zhang. ZONE: Zero-Shot Instruction-Guided Local Editing. (CVPR 2024).

Working Experience

United-Imaging Intelligence

Computer Vision Researcher Intern **Beijing**
Supervised by Prof. Dr. Xiantong Zhen. *11/2022–06/2023*
Detailed achievements:
- Implement a hierarchical variational multi-modal learning framework to distinguish subtle differences between intractable lung diseases.
- Use implicit neural representations to constrain the shape information in medical segmentation tasks.

SenseTime Research

Computer Vision Researcher Intern **Beijing**
Supervised by Dr. Yu Zhang. *01/2021–07/2021*
Detailed achievements:
- Found the blurry phenomenon of prior art in rotated scenes and aimed to use event cameras to solve it.
- Established a super-resolution GAN based on implicit neural representations.

Project Experience

Pattern Recognition Lab, Beihang University

Model Quantization and Compression **Beijing**
10/2022–Present
- Deploying a quantization-aware training (QAT) method in low-level Transformer models (IPT, Restormer).
- The purpose is to quantize all weights of neural networks into 4-bit with holding high accuracy and speed.

Microvibration Video Motion Magnification **Beijing**
03/2022–08/2022
- Inspired by Euler and Lagrange, we introduced an two-branch video motion magnification framework.
- Collected a new dataset by a exciter and measured motion magnification effect via physical information.

1-bit WaveNet in Speech Recognition **Beijing**
09/2020–09/2021
Compressed a speech recognition model WaveNet with binary neural networks and achieved a negligible performance compared with real-valued models on the specified dataset.

Department of Computer Science, Swiss Federal Institute of Technology in Zurich

Algorithms for (Sparse) Linear Regression and Experiments **Online**
Supervised by Prof. David Steurer. *05/2019–09/2021*
- Mastered the basic theories including optimization and gradient descent, linear regression, PCA, etc.
- Implemented a program and conducted simulation experiments including the LASSO algorithm.

Languages and Skills

Skills: Proficient in Python, PyTorch and OpenCV. Partial experience in C++ and MATLAB. Familiar in Docker and K8s.