# Xiaoyan Cong

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## Education

**Brown University**, Ph.D. Student of Computer Science — September 2024 – Present

- Advisor: *Professor* ***Srinath Sridhar***

**Zhejiang University**, B.Eng. in Robotics Engineering, Chu Kochen Honor College — September 2020 – June 2024

- GPA: 3.99/4.0
- Advisors: *Professor* ***Qixing Huang***

**Hong Kong University of Science and Technology**, Exchange Student — January 2023 – June 2023

- Dean's List
- Advisors: ***Professor Qifeng Chen*** & ***Professor Chenyang Lei***

## Research Interests

My research interest lies in broad aspects of Computer Vision, Computer Graphics and Machine Learning topics, more specifically 3D spatiotemporal visual perception, understanding and reasoning of human physical interactions with the world. I am also interested in understanding generative models (diffusion, flow model...) from both theoretical and application perspectives.

## Publications

**OscillationInversion: Understand the structure of Large Flow Model through the Lens of Inversion Method** — October 2024

***Anonymous***

*Under Review*

**Automatic Controllable Colorization by Imagination** — June 2024

***Xiaoyan Cong***, Yue Wu, Qifeng Chen, Chenyang Lei

*IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024* [arxiv: 2404.05661]

**4DRecons: 4D Neural Implicit Deformable Objects Reconstruction from a single RGB-D Camera with Geometrical and Topological Regularizations** — 2024

***Xiaoyan Cong***, Haitao Yang, Liyan Chen, Kaifeng Zhang, Li Yi, Chandrajit Bajaj, Qixing Huang

*Under Review* [arxiv: 2406.10167]

## Research Experience

**Research Intern**, University of Texas at Austin — Jun. 2023 – Nov. 2023

- Advisors: ***Prof. Qixing Huang*** & ***Prof. Li Yi***
- **4D Neural Implicit Deformable Objects Reconstruction**
  - Introduced a novel approach 4DRecons that takes a monocular RGB-D sequence of dynamic objects as input and outputs a complete textured deforming reconstruction.
  - Proposed an optimization procedure that enforces the deformation among adjacent frames is as-rigid-as-possible (ARAP) and ensures the topology remains fixed over time.
  - Demonstrated that 4DRecons can handle large deformations and complex inter-part interactions, outperforming state-of-the-art approaches considerably.

**Research Intern**, Hong Kong University of Science and Technology — Jan. 2023 – Nov. 2023

- Advisors: ***Prof. Qifeng Chen*** & ***Prof. Chenyang Lei***
- **Automatic Controllable Colorization by Imagination**
  - Introduced a novel framework for automatic and controllable colorization, enabling iterative editing and

modifications.

- Proposed an Imagination Module that utilizes Diffusion Models (ControlNet) to generate multiple reference candidates with similar semantics and structures to a black-and-white input. The optimal reference is composed from all reference candidates by selecting each segment with the most similar DINO feature.
- Devised a Colorization Module that colorizes the black-and-white input under the guidance of the optimal reference.
- Demonstrated our framework's superiority over state-of-the-art methods, achieving controllable and editable colorization, which is non-trivial in the automatic colorization community.

## Selected Awards and Honors

**Excellence Scholarship**, by Chu Kochen Honors College, Zhejiang University, Top 1% 2022

**Chinese National Scholarship**, by Ministry of Education of the People's Republic of China, Top 0.2% 2021

**Chunhui Scholarship**, by College of Control Science and Engineering, Zhejiang University, Top 1% 2023

**Zhejiang Provincial Government Scholarship**, Top 2% 2020 - 2022

**First-prize Scholarship of Zhejiang University**, Top 2% 2020 - 2022

## Computer and Language Skills

**Programming Languages:** Proficient in C/C++, Python (Pytorch), MATLAB.

**Technical Skills:** Linux/Windows, MeshLab, Blender, SolidWorks, CoppeliaSim, Multisim.

**Language:** Mandarin (native), English (fluent).