Hongchi Xia

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Research Interests

Computer Vision

Focus on: 3D computer vision, especially 3D world model, scene simulation, reconstruction, understanding, and robotics.

Education

University of Illinois Urbana-Champaign, Champaign, Illinois, USA *Aug. 2024(Expected) -*

Ph.D in Computer Science; Advised by Prof. Shenlong Wang;

Shanghai Jiao Tong University, Shanghai, China *Sep. 2020 - Jun. 2024*

B. Eng in Computer Science and Technology; Overall GPA: 4.07/4.3; ***Ranked 1st (1/106)***

A+ Courses: *Computer Graphics, Algorithms and Complexity, Operating Systems, Discrete Mathematics and 24 others*

University of Illinois Urbana-Champaign, Champaign, Illinois, USA *Jan. 2023 - Jul. 2024*

Visiting student *in Computer Vision Group, advised by Prof. Shenlong Wang and Prof. Wei-Chiu Ma*

Work as the remote research intern and submit an accepted paper to CVPR 2024 as the first author

University of California San Diego, San Diego, California, USA *Jun. 2023 - Feb. 2024*

Visiting student *in Artificial Intelligence Group, advised by Prof. Xiaolong Wang*

Work as the remote research intern and submit an accepted paper to CVPR 2024 as the first author

Publications

* : Authors with equal contribution

[1] **Hongchi Xia**, Chih-Hao Lin, Hao-Yu Hsu, Quentin Leboutet, Katelyn Gao, Michael Paulitsch, Benjamin Ummenhofer, Shenlong Wang, "HoloScene: Simulation-Ready Interactive 3D Worlds from a Single Video," Neural Information Processing Systems (NeurIPS), 2025.

[2] **Hongchi Xia**, Entong Su, Marius Memmel, Arhan Jain, Raymond Yu, Numfor Mbiziwo-Tiapo, Ali Farhadi, Abhishek Gupta, Shenlong Wang, Wei-Chiu Ma, "DRAWER: Digital Reconstruction and Articulation With Environment Realism," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2025.

[3] Hao-Yu Hsu, Chih-Hao Lin, Albert J Zhai, **Hongchi Xia**, Shenlong Wang, "Autovfx: Physically realistic video editing from natural language instructions," International Conference on 3D Vision (3DV), 2025.

[4] **Hongchi Xia**, Zhi-Hao Lin, Wei-Chiu Ma, Shenlong Wang, "Video2Game: Real-time, Interactive, Realistic and Browser-Compatible Environment from a Single Video," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

[5] **Hongchi Xia***, Yang Fu*, Sifei Liu, Xiaolong Wang, "RGBD Objects in the Wild: Scaling Real-World 3D Object Learning from RGB-D Video," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024.

[6] Bo Pang*, **Hongchi Xia***, Cewu Lu, "Unsupervised 3D Point Cloud Representation Learning by Triangle Constrained Contrast for Autonomous Driving," Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023.

Research Experience

Computer Vision Group, University of Illinois Urbana-Champaign Jan. 2023 - present

Advisors: Prof. Shenlong Wang, Prof. Wei-Chiu Ma *Champaign, Illinois, USA*

- **Simulation-Ready Interactive World From a Single Video [1]** [website] [paper]
  - Proposed a novel framework that targets the reconstruction of simulation-ready interactable environments from a single video, ensuring the realism, object completeness, and physical stability of the entire scene.

- **Digital Reconstruction and Articulation With Environment Realism [2]** [website][paper]
  - Proposed an automatic 3D interactive scene reconstruction framework which can perceive, reconstruct, and re-simulate the articulated objects in the 3D scene.

- **Real-time, Interactive, Realistic Environment from a Single Video [3]** [website][[paper]]
  - Proposed a novel systematic approach that automatically converts videos of real-world scenes into realistic and interactive game environments and robot simulation platforms

Deep Imagination Research, NVIDIA May. 2025 - present
Manager: Ming-Yu Liu *Santa Clara, California, USA*

Artificial Intelligence Group, University of California San Diego Jun. 2023 - Feb. 2024
Advisor: Prof. Xiaolong Wang *San Diego, California, USA*

- **WildRGB-D Dataset for Scaling Real-World 3D Object Learning [2]** [website][paper][dataset]
  - Collected the WildRGB-D Dataset, which comprises around 8,500 360-degree recorded objects and nearly 20,000 RGB-D videos spanning 46 object categories

Machine Vision and Intelligence Group, Shanghai Jiao Tong University Aug. 2022 - Jan. 2023
Advisor: Prof. Cewu Lu *Shanghai, China*

- **Unsupervised 3D Point Cloud Representation Learning [3]** [pdf]
  - Developed the Triangle Constrained Contrast (TriCC) framework to learn 3D unsupervised point cloud representations in autonomous driving scene