

Wenyan Cong

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🌐 [congwenyan](#)

Research Interests

Machine Learning, Computer Vision, Low-level Vision, Image Harmonization

Education

Shanghai Jiao Tong University(SJTU)

M.S., Dept. of Computer Science and Technology

Advisor: [Li Niu](#) and [Liqing Zhang](#)

Overall GPA: 3.83/4.00

Shanghai, China

Sep. 2019- Mar. 2022(expected)

Shanghai Jiao Tong University(SJTU)

B.E., Dept. of Computer Science and Technology

Overall GPA: 3.60/4.00

Shanghai, China

Sep. 2015- Jun. 2019

Research Experience

University of Texas at Austin

Graduate Research Assistant (Supervisor: Prof. [Atlas Wang](#))

Austin, TX

Jun. 2021 - Present

- **Deep Image Unfolding in the Wild:** On-going work on wide-range image blending with reference guidance; enabled novel and diverse content generation in the intermediate region.

Shanghai Jiao Tong University

Graduate Research Assistant (Supervisor: Prof. Li Niu)

Shanghai, China

Sep. 2019 - Present

- **High-Resolution Image Harmonization [C7]:** Combined complementary transformations of traditional and deep methods in an end-to-end framework; achieved ~50% improvement and saved ~65% time and computational resources.
- **Cross-Domain Image Harmonization [C6]:** Designed the first cross-domain image harmonization network using the mixture of rendered images and real images; achieved ~34% improvement on novel categories.
- **Rendered Human Harmonization Dataset Construction [C6]:** Constructed and released the first large-scale rendered harmonization dataset [RHHarmony](#) with 135k image pairs; mitigated the labor-intensive dataset extension.
- **Deep Video Harmonization:** Leveraged color mapping consistency to lift the burden of establishing spatial correspondence; achieved ~15% improvement than the strongest baseline with higher temporal consistency.
- **Video Harmonization Dataset Construction [C5]:** Constructed and released the first public video harmonization dataset [HYouTube](#) which contains 3194 pairs of synthetic composite videos and real videos.
- **Background-Guided Image Harmonization [C3][code]:** Formulated image harmonization as background guided domain translation task; enabled the prediction of inharmonicity level of composite images using domain code; achieved new state-of-the-art: ~21% improvements than the strongest baseline.
- **Image Harmonization via Domain Verification [C2][code]:** Designed a domain verification discriminator to pull close the foreground domain and background domain; achieved state-of-the-art performance: ~31% improvements than the strongest baseline; provided the first benchmark in image harmonization field.

Shanghai Jiao Tong University

Undergraduate Research Assistant (Supervisor: Prof. Li Niu)

Shanghai, China

Dec. 2018 - Aug. 2019

- **Image Harmonization Dataset Construction [C1]:** Constructed and released the first large-scale image harmonization dataset [iHarmony4](#) with 4 sub-datasets (HCOCO, HAdobe5k, HFlickr, and Hday2night) and 73146 pairs of high-quality images.

Work Experience

ZMO.AI(startup)

Research Intern

Shenzhen, China

Jan. 2021 - Apr. 2021

- Collaborated with upstream pose search, image inpainting, image matting, and image composition techniques and developed an efficient background harmonization network for real-time background replacement.
- Achieved excellent results on both indoor and outdoor backgrounds for on-model images; it has been applied to the practical application of content generation for e-commerce brands.

Hisense Co., Ltd.

Shanghai, China

Research Intern

Dec. 2020 - May 2021

- Turned recent research in deep image harmonization into revenue; achieved high-quality, high-resolution, and high-fps harmonization and carried it through Hisense's devices; made three relevant patents available.

Shanghai Jiao Tong University

Shanghai, China

Teaching Assistant

Mar. 2020 - Jul. 2021

- CS245: *Principles of Data Science* for undergraduates, Spring 2021.
- CS7335: *Statistical Learning and Inference* for postgraduates, Fall 2020.
- CS245: *Principles of Data Science* for undergraduates, Spring 2020.

Publications

[C7] **Wenyan Cong**, Xinhao Tao, Li Niu, Jing Liang, Xuesong Gao, Qihao Sun, and Liqing Zhang, "[High-Resolution Image Harmonization via Collaborative Dual Transformations](#)," *arXiv preprint arXiv:2109.06671*, 2021.

[C6] **Wenyan Cong**, Junyan Cao, Li Niu, Jianfu Zhang, and Liqing Zhang, "[Deep Image Harmonization by Bridging the Reality Gap](#)," *arXiv preprint arXiv:2103.17104*, 2021.

[C5] Xinyuan Lu, Shengyuan Huang, Li Niu, **Wenyan Cong**, and Liqing Zhang, "[HYouTube: Video Harmonization Dataset](#)," *arXiv preprint arXiv:2109.08809*, 2021.

[C4] Li Niu, **Wenyan Cong**, Liu Liu, Yan Hong, Bo Zhang, Jing Liang, and Liqing Zhang, "[Making Images Real Again: A Comprehensive Survey on Deep Image Composition](#)," *arXiv preprint arXiv:2106.14490*, 2021.

[C3] **Wenyan Cong**, Li Niu, Jianfu Zhang, Jing Liang, and Liqing Zhang, "[BargainNet: Background-Guided Domain Translation for Image Harmonization](#)," *IEEE International Conference on Multimedia and Expo (ICME)*, 2021. (Oral)

[C2] **Wenyan Cong**, Jianfu Zhang, Li Niu, Liu Liu, Zhixin Ling, Weiyuan Li, and Liqing Zhang, "[DoveNet: Deep Image Harmonization via Domain Verification](#)," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.

[C1] **Wenyan Cong**, Jianfu Zhang, Li Niu, Liu Liu, Zhixin Ling, Weiyuan Li, and Liqing Zhang, "[Image Harmonization Datasets: HCOCO, HAdobe5k, HFlickr, and Hday2night](#)," *arXiv preprint arXiv:1908.10526*, 2019.

Patents

[P3] "Real Human Harmonization in Virtual Scenes", China Patent, No. 202111051553.6., Jun. 2021. (The first inventor)

[P2] "High-Resolution Image Harmonization via 3D Look-Up Tables", China Patent, No. 202111051117.9., Jun. 2021.

[P1] "Progressive High-Resolution Image Harmonization", China Patent, No. 202111050230.5., Jun. 2021.

Honors and Awards

- National Scholarship for Graduate Students (Top 0.2% Nationwide) 2020
- Merit Student of Shanghai Jiao Tong University 2020
- Excellent League Cadre of Shanghai Jiao Tong University 2019
- Second Prize in "HUAWEI Cup" China Post-Graduate Mathematical Contest in Modeling 2019
- Outstanding Graduate of Shanghai Jiao Tong University 2019
- Academic Excellence Scholarship of Shanghai Jiao Tong University 2018, 2017, 2016

Professional Services

- Reviewer: International Joint Conference on Artificial Intelligence (IJCAI-21)

Skills

- Programming: Python, C++, Git, Bash, SQL, MATLAB
- Packages: PyTorch, TensorFlow, OpenCV
- Languages: Chinese (native), English (proficient)