XUANCHI REN

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EDUCATION

The Hong Kong University of Science and Technology — Hong Kong
BEng in Computer Science & BSc in General Math — Sept. 2017 – Jun. 2022

- **Major GPA**: 3.89/4.30 | **Overall GPA**: 3.75/4.30
- **Selected awards and honors:** Dean's list (TGA>3.7) for five terms; Recruitment Scholarship; Scholarship for Continuing UG Students; Kitchell Undergraduate Research Award (top 3 students)

École Polytechnique Fédérale de Lausanne (EPFL) — Lausanne, Switzerland
Computer Science | Exchange program — Feb. 2020 – Jun. 2020

PUBLICATIONS

- **Xuanchi Ren**, Haoran Li, Zijian Huang, Qifeng Chen. "Self-Supervised Dance Video Synthesis Conditioned on Music." Accepted by *2020 ACM Multimedia (ACM MM)* as **Oral** presentation (9% acceptance rate). *[paper][code]*
- **Xuanchi Ren***, Tao Yang*, Li Erran Li, Alexandre Alahi, Qifeng Chen. "Safety-Aware Motion Prediction with Unseen Vehicles for Autonomous Driving." Accepted by *2021 IEEE/CVF International Conference on Computer Vision (ICCV). [paper]*
- **Xuanchi Ren***, Tao Yang*, Yuwang Wang, Wenjun Zeng. "Learning Disentangled Representation by Exploiting Pretrained Generative Models: A Contrastive Learning View." Accepted by *2022 International Conference on Learning Representations (ICLR). [paper]*
- Dacheng Yin*, **Xuanchi Ren***, Chong Luo, Yuwang Wang, Zhiwei Xiong, Wenjun Zeng. "Retriever: Learning Content-Style Representation as a Token-Level Bipartite Graph." Accepted by *2022 International Conference on Learning Representations (ICLR). [paper]*
- Tao Yang, **Xuanchi Ren**, Yuwang Wang, Wenjun Zeng, Nanning Zheng. "Towards Building A Group-based Unsupervised Representation Disentanglement Framework." Accepted by *2022 International Conference on Learning Representations (ICLR). [paper]*
- **Xuanchi Ren**, Xiaolong Wang. "Look Outside the Room: Synthesizing A Consistent Long-Term 3D Scene Video from A Single Image." Submitted to *2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition* (*CVPR). [paper]*
- **Xuanchi Ren**, Tao Yang, Yuwang Wang, Wenjun Zeng. "Rethinking Content and Style: Exploring Bias for Unsupervised Disentanglement." Accepted by *2021 IEEE/CVF International Conference on Computer Vision (ICCV) AIM Workshop*. *[paper]*
- **Xuanchi Ren***, Zian Qian*, Qifeng Chen. "Video Deblurring by Fitting to Test Data." *[paper]*

RESEARCH EXPERIENCE

Microsoft Research Asia — Beijing
Research Assistant to Yuwang Wang, Wenjun Zeng, Sr. Principal Research Manager — Jun. 2020 – present

Rethinking Content and Style: Exploring Bias for Unsupervised Disentanglement (ICCVW 2021)

- The first to introduce content and style (C-S) into VAE-based unsupervised disentanglement
- Achieved the state-of-the-art unsupervised C-S disentanglement, which was comparable or even better than supervised methods

Retriever: Learning Content-Style Representation as a Token-Level Bipartite Graph

- Proposed a *modal-agnostic* and *unsupervised* framework to learn a novel token-level bipartite graph representation of content and style from structured input
- Demonstrated the power of Retriever in challenging downstream tasks in both speech and image domains
- Achieved the state-of-the-art performances on both zero-shot voice conversion and image part discovery

Learning Disentangled Representation by Exploiting Pretrained Generative models: A Contrastive Learning View

- The first to endow non-disentangled VAE, GAN, or Flow models with the SOTA disentanglement ability
- Found the disentangled directions in the latent space and extracted disentangled representations of images simultaneously through revised contrastive learning

Towards Building A Group-based Unsupervised Representation Disentanglement Framework

- The first to unify the formal group-based mathematical definition with the existing VAE-based probability inference models
- Trained 1,800 models covering the most prominent VAE-based models on five datasets to verify the effectiveness of our method

École Polytechnique Fédérale de Lausanne (EPFL) Lausanne, Switzerland

Research Assistant to Professor Alexandre Alahi, Dr. Li Erran Li, IEEE/ACM Fellow Mar. 2020 – Mar. 2021

Safety-Aware Motion Prediction with Unseen Vehicles for Autonomous Driving (ICCV 2021)

- Presented and formulated a new task: *safety-aware motion prediction*, including prediction for unseen vehicles
- Presented a customized U-Net architecture with a dilated bottleneck and an unseen-aware self-attention unit to obtain the proposed *earliest occupancy map*

Hong Kong University of Science and Technology Hong Kong

Research Assistant to Professor Qifeng Chen May 2019 – present

Self-Supervised Dance Video Synthesis Conditioned on Music (ACM MM 2020 Oral)

- Presented an approach with pose perceptual loss for self-supervised dance video synthesis
- Utilized two discriminators and deployed an attention module mechanism to generate a coherent dance skeleton sequence that matched the length, rhythm, and emotion of a piece of music
- Proposed a novel cross-modal evaluation that measured the similarity between music and a dance skeleton sequence

Video Deblurring by Fitting to Test Data

- Presented a self-supervised video deblurring pipeline without the need for a large training dataset
- Accelerated the pipeline by about 100 times through combining with meta-learning
- Published a dataset containing 70 real-world videos with motion blur that could be used for evaluation on the deblurring task

University of California San Diego San Diego, Calif.

Research Assistant to Professor Xiaolong Wang May 2021 – Dec. 2021

Look Outside the Room: Synthesizing A Consistent Long-Term 3D Scene Video from A Single Image

- Presented a geometry-free autoregressive-based model that synthesized a consistent long-term video based on a single input image
- Proposed a novel Transformer model with camera-aware bias as a 3D inductive bias

ADDITIONAL INFORMATION

Additional Professional and Extracurricular Experiences

- Champion, RoboMaster Overseas Regional Competition (competed Sept. 2017-Sept. 2018)
- Reviewing Service: ICLR 2022

Computer and Language Skills

- Python(Proficient); Pytorch(Proficient); Tensorflow(Familiar); C++ (Familiar); JavaScript(Familiar)
- English (Fluent); Mandarin (Native)