REN Xuanchi (Tim)

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EDUCATION

The Hong Kong University of Science and Technology Sep 2017-Present
BEng in Computer Science & BSc in General Math | **GPA:** 3.8 / 4.3 (**CS:** 3.85 / 4.3)
Honors: Dean's list (TGA>3.7); Recruitment Scholarship; Scholarship for Continuing UG Students

École polytechnique fédérale de Lausanne (EPFL) Feb 2020-June 2020
Computer Science | Exchange program

PUBLICATION

* indicates equal contribution

Self-supervised Dance Video Synthesis Conditioned on Music
Xuanchi Ren, Haoran Li, Zijian Huang, Qifeng Chen
ACM MM, 2020 **Oral Presentation** (9% acceptance rate) *[paper]*

Video Deblurring by Fitting to Test Data
Xuanchi Ren*, Zian Qian*, Qifeng Chen
Submission to IROS 2021 [paper]

Do Generative Models Know Disentanglement? Contrastive Learning is All You Need
Xuanchi Ren*, Tao Yang*, Yuwang Wang, Wenjun Zeng
Submission to ICML 2021 [paper]

GroupifyVAE: from Group-based Definition to VAE-based Unsupervised Representation Disentanglement
Tao Yang, Xuanchi Ren, Yuwang Wang, Wenjun Zeng, Nanning Zheng, Pengju Ren
Submission to ICML 2021 [paper]

Rethinking Content and Style: Exploring Bias for Unsupervised Disentanglement
Xuanchi Ren, Tao Yang, Yuwang Wang, Wenjun Zeng
Submission to ICCV 2021 [paper]

Safety-aware Motion Prediction with Unseen Vehicles for Autonomous Driving
Xuanchi Ren*, Tao Yang*, Li Erran Li, Alexandre Alahi, Qifeng Chen
Submission to ICCV 2021

RESEARCH EXPERIENCE

Microsoft Research Asia **Beijing, China**
Supervisor: Yuwang Wang, Wenjun Zeng *June 2020 – Present*

Rethinking Content and Style: Exploring Bias for Unsupervised Disentanglement

- First author of this work.
- The first one to introduce content and style (C-S) into VAE-based unsupervised disentanglement.
- Achieve unsupervised C-S disentanglement by introducing both data and model inductive bias.
- Achieve the state-of-the-art unsupervised C-S disentanglement, which is comparable or even better than supervised methods.

Do Generative Models Know Disentanglement? Contrastive Learning is All You Need

- Co-first author of this work.
- The first to endow non-disentangled VAE, GAN, or Flow models with the SOTA disentanglement ability.
- Find the disentangled directions in the latent space and extract disentangled representations of images simultaneously by revised Contrastive Learning.

GroupifyVAE: from Group-based Definition to VAE-based Unsupervised Representation Disentanglement

- Co-author of this work.
- The first to unify the formal group-based mathematical definition with the existing VAE-based probability inference models.
- Train 1800 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**
Supervisor: Alexandre Alahi, Li Erran Li, Qifeng Chen *March 2020 – March 2021*

Safety-Aware Motion Prediction with Unseen Vehicles for Autonomous Driving

- First author of this work.
- Present and formulate a new task: *safety-aware motion prediction*, including prediction for unseen vehicles.
- Present a customized U-Net architecture with a dilated bottleneck and an unseen-aware self-attention unit to obtain proposed *earliest occupancy map*.

Hong Kong University of Science and Technology **Hong Kong, China**
Supervisor: Qifeng Chen *May 2019 – Present*

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

- First author of this work.
- Present a learning-based approach with pose perceptual loss for self-supervised dance video synthesis.
- Utilize two discriminators and deploying attention module mechanism to generate a coherent dance skeleton sequence that matches the length, rhythm, and the emotion of a piece of music.
- Propose a novel cross-modal evaluation that measures the similarity between music and a dance skeleton sequence.

Video Deblurring by Fitting to Test Data

- Co-first author of this work.
- Present a self-supervised video deblurring pipeline without the need of a large training dataset.
- Combined with meta-learning, our pipeline can be accelerated by about 100 times and also achieve the state-of-the-art performance.
- Publish a dataset containing 70 real-world videos with motion blur that can be used for evaluation on the deblurring task.

PROJECT EXPERIENCE

Predicting the waiting time at Bus Stop **Hong Kong**
Team Leader Sep 2018 – Jan 2019

- A subproject of a prodigious project “Pulse of HKUST” to predict the waiting time at the bus stop.
- Used Pandas to proceed the data and Processed the data to fit the model.
- Time Series Prediction with LSTM Recurrent Neural Networks in Python.

Innovate the Retail Industry with Automatic Checkout System **Hong Kong**
Researcher Mentor: Qifeng Chen Feb 2019 – May 2019

- Dealing with the dataset of retail industry published by Megvii.
- Improved the data augmentation phase by using a deep learning based salient object detection algorithm.
- Used image inpainting method to render high quality real-world images.
- Used FPN as our network structure to train the detector and achieved 64.32% checkout accuracy.

WORKING EXPERIENCE

Microsoft Research Asia **Beijing, China**
Intern in Intelligent Multimedia Group *June 2020 – Present*

- Researched on disentanglement, unsupervised learning and generative models.
- Completed three research projects submitted to conferences.

COMPETITION EXPERIENCE

RoboMaster Team *–participant in RoboMaster Robotics Competition, held by DJI*
Teammate *Sep 2017 – Sep 2018*

- Winning the Champion of RoboMaster Oversea Regional Competition 2018.
- Participant in the Final Tournament of RoboMaster Robotics Competition 2018.
- Served as a mechanical engineer in the Team, with SolidWord skill and software skill.
- Discussed and designed the robots and made them functional.

SKILLS, ACTIVITIES & INTERESTS

Languages: English (Fluent); Mandarin (Native)
Technical Skills: C++ (Proficient); JavaScirpt(Familiar); Python(Proficient); Pytorch(Proficient); Tensorflow(Familiar);