

Chaoyue Song

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EDUCATION

Shanghai Jiao Tong University (SJTU)

Sep 2016 - Jul 2020

B.E. in Information Engineering (AI), School of Electronic Information and Electrical Engineering

- Overall GPA: 87/100 Math-related: 90/100
- Core Courses: Machine Learning (91), Digital Image Processing (94), Discrete Mathematics (100), Thinking and Approach of Programming (C++, 92), Data Structure and Algorithms (89), Linear Algebra (90), Probability and Statistics (92), Calculus (91), Intelligent Internet of Things (96)

RESEARCH INTERESTS

Computer Vision, Machine Learning

PUBLICATIONS

- Chaoyue Song, Jiacheng Wei, Ruibo Li, Fayao Liu, Chen Qian, Guosheng Lin. **Unsupervised 3D Pose Transfer with Cross Consistency and Dual Reconstruction**, *Under Review*, 2021
- Chaoyue Song, Jiacheng Wei, Ruibo Li, Fayao Liu, Guosheng Lin. **3D Pose Transfer with Correspondence Learning and Mesh Refinement**, in *Neural Information Processing Systems (NeurIPS)*, 2021
- Yugang Chen, Muchun Chen, Chaoyue Song, Bingbing Ni. **CartoonRenderer: An Instance-based Multi-Style Cartoon Image Translator**, in *International Conference on Multimedia Modeling (MMM)*, 2020
- Chaoyue Song, Yugang Chen, Shulai Zhang, Bingbing Ni. **Facial Image Deformation Based on Landmark Detection**, *arXiv*, 2019

RESEARCH EXPERIENCE

Nanyang Technological University

Oct 2020 - Present

Research Engineer Advisor: Prof. Guosheng Lin

Singapore

Unsupervised 3D Pose Transfer with Cross Consistency and Dual Reconstruction

- Proposed an unsupervised deep learning framework to solve the 3D pose transfer problem in an end-to-end manner
- With a generator that contains correspondence learning and mesh generation modules as the basic component, proposed a cross consistency learning scheme and a dual reconstruction objective to learn the pose transfer without supervision. And adopted an as-rigid-as-possible deformer to keep the body shape of the generated results
- Demonstrated that our method achieves comparable performance as the state-of-the-art supervised methods quantitatively and qualitatively on both human and animal meshes and even outperforms some of them

3D Pose Transfer with Correspondence Learning and Mesh Refinement

- Solved the pose transfer problem with our proposed correspondence-refinement network. To the best of our knowledge, our method is the first to learn the correspondence between different meshes and refine the generated meshes jointly in the 3D pose transfer task
- Learned the shape correspondence by solving an optimal transport problem without any key point annotations and generated high-quality final meshes with our proposed elastic instance normalization in the refinement module
- Demonstrated that our method outperforms state-of-the-art methods quantitatively and qualitatively on both human and animal meshes through extensive experiments

SJTU Vision and Learning Lab

Feb 2019 - Nov 2019

Research Assistant Advisor: Prof. Bingbing Ni

Shanghai, China

CartoonRenderer: An Instance-based Multi-Style Cartoon Image Translator

- Proposed a "CartoonRenderer" framework which could utilize a single trained model to generate multiple cartoon styles
- Achieved the cartoonization by conducting transformation manipulation in the feature space with proposed Soft-AdaIN and completed the whole generating process which could be decoupled into "Modeling-Coordinating-Rendering" parts

- Trained different models with the same dataset to accomplish the photo cartoonization, such as CycleGAN, AdaIN method, and CartoonGAN, demonstrated that our CartoonRenderer performed better

Facial Image Deformation Based on Landmark Detection

- Completed the deformations from two aspects: expansion of eyes and shrinking of noses, mouths, and cheeks
- Trained a 106-point facial landmark detector which could provide control points to implement more authentic deformations for facial images
- Used Bilinear Interpolation in the expansion and Moving Least Squares methods (MLS) includes affine deformations, similarity deformations, and rigid deformations in the shrinking which both had a good performance

Research Center of Intelligent Internet of Things, SJTU

Feb 2019 - Jul 2019

Research Assistant Advisor: Prof. Xiaohua Tian

Shanghai, China

Dense QR Decoder Based on TensorFlow Lite

- National Undergraduate IoT Design Contest in China, First Prize in Final Contest (Top 35 of the 2000 teams)
- Developed an APP on Android which could decode plenty of QR codes(more than 160) at the same time, designed this APP in three different modules: Object Detection, Object Tracking, and User interface
- Used machine learning model based on TensorFlow Lite and an efficient FFT-based method in Object Detection module, achieved the real-time feature(15 frames/s on CPU) and high recognition rate(157/160) by modifying the network structure
- Designed an algorithm based on constructing an information matrix to accomplish the Object Tracking module, further improved recognition rate(160/160) through multi-frame fusion

HONORS & AWARDS

Excellence Graduate Award of Shanghai	Jul 2020
Outstanding Scholarship of Shanghai Jiao Tong University(Top 10%)	Nov 2019, Nov 2018, Nov 2017
Excellent League Cadre of Shanghai Jiao Tong University(Top 0.3%)	May 2019, May 2018
Excellent Student Cadre of Shanghai Jiao Tong University(Top 0.3%)	Oct 2018

TECHNICAL SKILLS

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- **Machine Learning:** PyTorch, TensorFlow, Caffe, Sklearn, Keras, NumPy, Pandas
 - **Programming Language:** C / C++, Python, VHDL, Verilog
 - **Platforms and Tools:** MATLAB, LaTeX, LabVIEW, Unity