Chaoyue Song

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RESEARCH INTERESTS

Computer Vision, Machine Learning, Image Processing

EDUCATION

Shanghai Jiao Tong University (SJTU)　　　　　　　　　　　　　　　　　　　　*Sep 2016 - Jun 2020(Expected)*

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

- Overall GPA: 87.34/100　　Major GPA: 89.34/100
- 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 EXPERIENCE

CartoonRenderer: An Instance-based Multi-Style Cartoon Image Translator　　　　　　　　*Feb 2019 - Aug 2019*

Advisor: Prof. Bingbing Ni, SJTU Vision and Learning Lab

- Proposed a "CartoonRenderer" framework which could utilize a single trained model to generate multiple cartoon styles, map photo into a feature model and render the feature model back into image space
- 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, compared the generation results with ours and showed that our CartoonRenderer performed better

Facial Image Deformation Based on Landmark Detection　　　　　　　　　　　　　　　*Feb 2019 - Jul 2019*

Advisor: Prof. Bingbing Ni, SJTU Vision and Learning Lab

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

Dense QR Decoder Based on TensorFlow Lite　　　　　　　　　　　　　　　　　　　*Feb 2019 - Jul 2019*

National Undergraduate IOT Design Contest in China, Honored with First Prize in Final Contest(Top 35 of the 2000 teams)

Advisor: Prof. Xiaohua Tian, Research Center of Intelligent Internet of Things

- 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 parts: Object Detection, Object Tracking and User interface
- Used machine learning model(SSD-like) based on TensorFlow Lite and an efficient FFT-based method in Object Detection part, 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 information matrix to accomplish the Object Tracking part, further improved recognition rate(160/160) through multi-frame fusion

VR Visualization of Mars Orbit　　　　　　　　　　　　　　　　　　　　　　　　*Oct 2018 - Feb 2019*

The 3rd School-Enterprise Innovation and Practice Plan for Undergraduates of SJTU

- Established the model of stars in the solar system and their trajectory based on Unity
- Showed the phenomenon of Mars Retrograde from different perspectives
- Developed a simple and understandable human-computer interface and added vivid voice prompts for children

GEEM:An Analysis of the Three Dragons *Jan 2019*

American Mathematical Contest in Modeling, Team Leader

- Proposed a model GEEM(Growth Model, Energy Model, and Ecological Environment Model) to fully analyze different aspects, such as weight, metabolism, and ecological requirements of dragons
- Used Von Bertalanffy equation and Lotka-Volterra equation to build the Growth Model and the Ecological Environment Model, respectively
- Explained the impact of climate changes on dragons and calculated the weight changes during dragon's migration by using GEEM

Development of Garbage Collection Robot Based on Arduino *Jan 2017 - Jun 2017*

Senior Design Course Projects Expo of SJTU, Excellent Project Award The First Place(Top 6 of the 200 teams), Team Leader

- Implemented automatic capture and collection of garbage by Arduino programming and hardware structure design
- Designed a robotic arm and connected it to three steering gears for capturing
- Developed an accurate recognition system based on distance sensor and designed a motion module combining driving wheels and steering wheels

PUBLICATIONS

- Yugang Chen, Muchun Chen, **Chaoyue Song**, Bingbing Ni. **CartoonRenderer: An Instance-based Multi-Style Cartoon Image Translator**, *International Conference on Multimedia Modeling(MMM2020, accepted)*
- **Chaoyue Song**, Yugang Chen, Shulai Zhang, Bingbing Ni. **Facial Image Deformation Based on Landmark Detection**, *arXiv:1910.13671*

TECHNICAL SKILLS

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

HONORS & AWARDS

- Excellent League Cadre of Shanghai Jiao Tong University(Top 0.3%) *May 2019, May 2018*
- Outstanding Scholarship of Shanghai Jiao Tong University(Top 10%) *Nov 2019, Nov 2018, Nov 2017*
- Excellent Student Cadre of Shanghai Jiao Tong University(Top 0.3%) *Oct 2018*

EXTRACURRICULAR ACTIVITIES & LEADERSHIP

Student Sports Association, SJTU *Jun 2018 - May 2019*

Executive Chairman

- Organized various sports activities, such as long-distance running festivals(the biggest sport event in SJTU, more than 2,000 people participated), soccer matches, basketball matches, sailing competitions, etc
- Managed 44 sports associations

Student Union, School of Electronic Information and Electrical Engineering *Jan 2018 - Jan 2019*

Director

- Organized academic lectures and hosted dating events with students from other universities
- Worked as the director and participated in the entire process of dating events, including brand building, publicity, directing and reception