Renjie Wu

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RESEARCH INTERESTS

Computer Graphics, Computer Vision, Artificial Intelligence, Machine Learning

EDUCATION

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

B.S. in **Computer Science and Technology**

Overall GPA: **85.82/100** Major GPA: **92.3/100**

Core Courses: Algorithm and Complexity (98/100) Computer Graphics (92.5/100) Artificial Intelligence(87/100) Virtual Reality and Augmented Display (93/100) Data Visualization and Visual Analytics (93/100)

RESEARCH EXPERIENCES

Clothes Recognition and Retrieval *Jul. 2019 - Aug. 2019*

Advisor: Prof. Liqing Zhang, Institute of Intelligent Human-Computer Interaction, SJTU

- Systematically studied clothing retrieval networks such as Faster R CNN, FashionNet
- Obtained the basal dataset of the clothes images from JingDong with the web crawler, produced a new dataset with 616575 images and associated labels with 20 multi-label attribute classes manually
- Chose 20 multi-label attribute classes (totally 202 attributes) for training
- Designed and implemented a Recognition Network based on VGG which owns 20 subnets for multi-label training, optimized the accuracy to 0.9646 with methods such as Xavier, batch normalization
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Skills Involved: Python/C++, Tensorflow, Numpy

VR-based 3D Tooth Operation Model System for Dental Surgery *Apr. 2019 - Jun. 2019*

Advisor: Prof. Bin Sheng, Institute of Computer Application, SJTU

- Proposed and Implemented a method for relocating the center, initially equal to the center of the whole teeth, of each tooth, established single tooth coordinate systems and oriented bounding boxes (OBB) for each tooth by using principal component analysis (PCA)
- Implemented interactions with 10 forms of transformation for each tooth with keyboard and mouse:
  - Rotate around X/Y/Z axis of the tooth
  - Pan along X/Y/Z axis
  - Rotate around left/right/top/bottom side
- Established scenes of operation for data displaying and transplanted the PC interactions to VR interactions for simulating the operation of dental surgery, implemented the calculation of transform matrix for each tooth

Skills Involved: Unity, C#, Numerics, PCA, OBB, VRTK, SteamVR

Reconstructing Teeth from a CT scan *Sep. 2018 – Dec. 2018*

Advisor: Prof. Bin Sheng, Institute of Computer Application, SJTU

- Produced a dataset of 315 teeth images manually from CT scans with Photoshop

- Implemented a FCN network for segmenting teeth parts from the whole CT scans automatically
- Implemented edge extraction using canny/sobel operator, point cloud generation from extracted edges with PCL and OpenCV library and 3D mesh model reconstruction with MeshLab

Skills Involved: Python, C++, MATLAB, FCN, PCL, Photoshop

SELECTED PROJECTS

VR-based Alpine Skiing project for 2022 Olympic Winter Games *Apr. 2019 - Jun. 2019*

Advisor: Prof. Bin Sheng, Institute of Computer Application, SJTU

- Established realistic scenes associated with snow mountains and skiing
- Implemented a real-time detection system combined on VR handles which can be used to detect the orientation and swing range of players with methods of relative displacement
- Implemented mechanism used for controlling the player by imitating the real operation

Skills Involved: Unity Shader, C#, Cosines, VRTK, SteamVR

ChinaVis 2019 Data Visualization *May. 2019 - Jun. 2019*

Advisor: Prof. Xiaoju Dong, Institute of Theoretical Computer Science, SJTU

- Analyzed a set of data from ChinaVis 2019 with methods of cluster and found the inner relationship among the data and some outliers
- Established a webpage for demonstrating the findings about the relationship and outliers with different charts

Skills Involved: Python, HTML, CSS, JavaScript, d3.js, Ajax

HONORS AND AWARDS

Outstanding Students Awards(Expected) *Oct. 2019*

Excellent League Member *May. 2017*

Outstanding students of Military Training *Sep. 2017*

LEADERSHIP AND ACTIVITIES

Core Member of CCYL committee of Machinery and Engineering College *Sep. 2016 - Sep. 2017*

Core Member of Student Service Center (SSC) *Sep. 2017 - Sep. 2019*

Organized photography trainings, designed and organized the filming of Anniversary Memorial Video for SSC, recorded school major conference such as “FanXing Plan”

Monitor of Class F1603305 *Sep. 2016 - Jun. 2020 (Expected)*

Organized and participated in Class Style Contest and won the third prize

Volunteer of Shanghai International Marathon *Nov. 2017, Oct. 2018*

Volunteer of Welcome Conference of SJTU *Sep. 2017*

SKILLS

Language: Python, C/C++, HTML, CSS, JavaScript, C#, MATLAB, SQL, Java, Swift

Machine Learning: Numpy, Tensorflow

Graphics: OpenGL, Unity

Others: Photography, Adobe Photoshop