Renjie WU

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EDUCATION

Shanghai Jiao Tong University(SJTU) Sep. 2016 - Jun. 2020 (expected)
School of Electronic Information and Electrical Engineering (SEIEE)
B.S. in **Computer Science and Technology**
Overall GPA: 3.6/4.0 (**85.8**/100), **Junior GPA: 4.0**/4.0 (**92.3**/100)
Courses: Algorithm and Complexity (98/100), Computer Graphics (92.5/100), Data Visualization and Visual Analytics (93/100), Introduction to Cryptology and Information Security (92/100), Virtual Reality and Augmented Display (93/100)

RESEARCH EXPERIENCES

Clothes Recognition and Retrieval Based on Semantic Representation Jul. 2019 - Aug. 2019
Group Leader, Advisor: Prof. Liqing Zhang, Brain-like Computing and Machine Intelligence Laboratory, SJTU

- Designed and implemented a Classification and Retrieval Network which combined the basic network frame of Faster R-CNN with multi categories and attributes utilized in FashionNet; Limited the number of attributes and set the output values as binary codes for both accurate classification and fast retrieval
- Processed a new clothes dataset containing 20 attribute classes spanning 202 attributes for training (more than 660,000 images and associated labels) by crawling clothes images and descriptions from JingDong (China's second-largest e-commerce platform), extracting useful tags from goods descriptions, and merging similar semantic tags
- Trained and optimized the network with the accuracy of 96.49%; Encoded the output of each image as a list containing 20 vectors; Calculated the sum of different classes' Euclidean distances in two lists as their final distance; Retrieved similar clothes through a hierarchical search strategy using their final distances as a similarity measure

VR-Based 3D Tooth Operation Model System for Dental Surgery Apr. 2019 - Jun. 2019
Group Leader, Advisor: Prof. Bin Sheng, Visual Media and Data Management Laboratory, SJTU

- Calculated 3 axes, established single tooth coordinate systems, and calculated oriented bounding boxes (OBB) for each tooth using principal component analysis (PCA) to improve the accuracy of locating operating axes and points
- Developed 10 interaction modes (rotation around X/Y/Z axis and left/right/top/bottom side of the tooth, translation along X/Y/Z axis) for each tooth in both PC system and VR system
- Established scenes for surgery simulation and data displaying (number, transformation matrix of the chosen tooth, etc.); Integrated all functions above in a VR application which could be used to simulate surgery vividly and calculate the transformation matrix of each tooth during operation

Reconstructing Teeth from a CT Scan Sep. 2018 - Dec. 2018
Group Leader, Advisor: Prof. Bin Sheng, Visual Media and Data Management Laboratory, SJTU

- Designed and implemented a neural network based on SegNet to segment teeth parts from converted CT images; Constructed teeth dataset by annotating teeth using Photoshop after converting CT scans to PNG images; Optimized the performance of the network to high accuracy (99.5% in testing) using SELU
- Extracted edges of segmented teeth images using the canny operator which is not susceptible to noise; Generated point clouds on extracted edges and reconstructed the 3D teeth mesh model using spatial characteristics of CT scans
- Proposed an optimized method which segmented teeth from CT scans using the network above but changed produced images into CT formats to utilize existing mature medical imaging technology for reconstruction

SELECTED PROJECTS

VR-Based Alpine Skiing Project for 2022 Olympic Winter Games Apr. 2019 - Jun. 2019
Core member, Advisor: Prof. Bin Sheng, Science and Technology Innovation Project, SJTU VR Education Center

- Designed a real-time detection system based on relative angle and collision mechanism of predefined tags to detect the orientation and swing range of player's arms and applied them to the player in the VR application

- Established realistic scenes associated with snow mountains and skiing using Unity; Designed an interactive VR action game with two different modes (Prop Mode and Gate Mode)

ChinaVis 2019 Data Visualization and Analysis Challenge May. 2019 - Jun. 2019
Core member, Advisor: Prof. Xiaoju Dong, Data Visualization Course Project, SJTU

- Predicted the conference agenda, possible types of participants, and relationships of participants as well as emergency represented by outliers after analyzing data of sensors through clustering
- Designed and implemented an interactive visual analysis website to demonstrate findings about the relationship and outliers with 9 different kinds of charts (Personal Track Map, Radial Bar Chart, etc.) and different interactive methods

Gene Data Classification Using Classical Approaches and Deep Learning Sep. 2018 - Dec. 2018
Group leader, Advisor: Prof. Bo Yuan, Artificial Intelligence Course Project, SJTU

- Implemented pretreatment and dimensionality reduction using normalization and PCA to change ill-posed questions into well-expressed mathematics questions
- Used deep learning techniques and classical methods (SVM, Logistic Regression, and Decision Tree) for binary and multiple classification; Assessed and compared performances of different methods according to their accuracy and training time in both binary and multiple classification

HONORS AND AWARDS

Elite Liu Yongling Scholarship (**top 1%**)	Oct. 2019
Academic Excellence Scholarship of Shanghai Jiao Tong University (**top 10%**)	Nov. 2019
Academic Progress Scholarship of Shanghai Jiao Tong University	Nov. 2019
Outstanding Students of Military Training (**top 10%**)	Sep. 2017
Excellent League Member of Shanghai Jiao Tong University (**top 10%**)	May. 2017

LEADERSHIP AND SOCIAL ACTIVITIES

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

- Led classmates to participate in Class Style Contest and won the first prize (only four classes earned this prize among 40 classes); Organized classmates to take part in the Competition of Best Classes of SJTU and earned the Third Prize of The Best Class Award in the sophomore year (other winning classes are at least in their junior year)
- Organized more than 20 activities in the class of 31 students such as class meetings, class trips, and contests

Core Member - Student Service Center (SSC, university-wide) Sep. 2017 - Sep. 2019

- Organized at least 5 photography trainings for more than 30 new members
- Undertook the photojournalism work of many large conferences at SJTU such as "FanXing Plan" and "Top Ten Influential People on Campus"; Designed and organized the filming of the video for Anniversary Memorial of SSC

Volunteer - Shanghai International Marathon Nov. 2017, Oct. 2018

SKILLS

Programming: Python (TensorFlow, Keras, NumPy), C, C++ (OpenGL), C#, HTML, JavaScript, SQL, Java, Swift
Professional Tools: Unity, MATLAB, LaTeX, Adobe Photoshop
Other: Photography