Zhengjie Xu

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Education

University of California San Diego — Sep 2017 – Dec 2020

- B.S. in Computer Engineering and Applied Mathematics (Double Major)
- GPA: 3.8/4.0 Major GPA in C.E.: 3.9/4.0 Major GPA in A.Math: 3.8/4.0
- Relevant Courses: *Intro to AI: Search & Reason* (A+), *Statistical NLP* (A+), *Intro to Computer Vision* (A+), *Intro to Computer Vision II* (A), *Computer Graphics* (A+), *Advanced Topics in CS: Geometry Meets Machine Learning* (A, grad-level), *Probabilistic Reasoning & Learning* (in-progress, grad-level)

Research Experience

Undergraduate Researcher @ SuLab — Jul 2019 - Present

- Advised by Prof. Hao Su
- Focusing on learning-based 3D perception and video object segmentation

Undergraduate Researcher @ GURU & SDSC — Jan 2019 - Present

- Advised by Prof. Garrison W. Cottrell and Dr. Mai Nguyen
- Focusing on video object tracking and medical imaging segmentation

Projects

Video Motion Segmentation @ SuLab — Aug 2020 - Present

- Aim to use low level geometry information, like rotation in 3D, to infer objects in motion
- Create deep-learning modules to predict depth, optical flow and camera matrices within two frames
- Test on CATER synthetic dataset, and in real video object segmentation datasets in the future
- Incorporate with object manipulation to do 0-shot object or part discovery

Super-pixel Sampling in 3D @ SuLab — Jan 2020 – Apr 2020

- Re-implemented Super-pixel Sampling Network (SSN) in PyTorch and extended to 3D scenario
- Used PointNet++ as backbone and integrate SSN in grouping stage
- Optimized to run with no obvious latency compared to original PointNet++
- Performed 3D part segmentation and achieved better results compared to PointNet++ baseline

Normal Assisted Stereo Depth Estimation @ SuLab — Jul 2019 – Oct 2019

- Used normal map of images to enforce depth consistency and produce high-quality depth map
- Implemented the baseline model of GeoNet in PyTorch
- Trained models to predict anchors that have high prediction accuracy to help future inference

Cardiac Imaging Segmentation @ GURU & SDSC — Jun 2019 – Jun 2020

- Segmented out left and right ventricle from cardiac MRI images for both humans and mice
- Implemented multiple architecture in PyTorch, including U-Net, DenseNet, GammaNet, etc.
- Experimented transfer learning from mice cardiac images to human's
- Tested performance among different architecture, segmentation methods and loss design

Dolphin Video Detecting and Tracking @ GURU — Jan 2019 – Jun 2019

- Used Yolo as backbone to detect and track moving dolphins in low-resolution videos

- Labeled 6000+ images for overlapping dolphins to train the model
- Used background subtraction and optical flow to provide additional information for tracking

IMDB Review Classifier @ UCSD May 2019 – Jul 2019

- Created a website that takes in a sentence and evaluates the possible score coming with this review
- Implemented word2vec and computed classified results using cosine similarities
- Provided a word cloud to show the most frequent words appeared for each score
- Implemented the website in Django and used a crawler to get the data from IMDB website

Teaching Experience

Tutor for CSE 11: Intro to CS and OOP Apr 2018 – Jun 2018

Work Experience

Software Engineer Intern @ Shanghai Insurance Exchange Jul 2018 - Sep 2018

- Helped implementation of encryption algorithm and distributed system of block chain
- Re-implemented and validated the paper Snowflake to Avalanche
- Participated in writing the white papers of Insurance Exchange Block Chain

Related Skills

- Expertise in Java, Python and C; Proficient with C++, Swift and Golang
- Libraries: PyTorch, Tensorflow, Torch, Keras, OpenCV, NumPy, Scipy, etc.
- Machine Learning Algorithms: Naïve Bayes, K-means, KNN, SVM, EM, Q-learning, etc.
- Math: Convex Optimization, Statistics, Real Analysis, Partial Differential Equation, Graph Theory, etc

Honors & Awards

- Provost's Honors for all quarters