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Ligeng Zhu

Education

2015 – now **Simon Fraser University**, *Vancouver*, BC, Canada.
B.Sc in Computing Science, Dual Degree Program exchange. GPA: 3.71/4.3

2013 – now **Zhejiang University**, *Hangzhou*, Zhejiang, China.
B.Eng in Computer Science & Technology. GPA: 3.8/4.0

Publications and Manuscripts

Submitted **Sparsely Aggregated Convolutional Networks**.
Ligeng Zhu, Ruizhi Deng, Zhiwei Deng, Greg Mori and Ping Tan
Under review in CVPR 2018

Submitted **Small Object Sensitive Segmentation of Urban Street Scene with Consistent Spatial Adjacency Between Object Classes**.
Ligeng Zhu*, Dazhou Guo*, Yuhang Lu and Song Wang (* denotes equal contribution)
Under review in CVPR 2018

Submitted **Learning to Forecast Videos of Human Activity with Multi-granularity Models and Adaptive Rendering**.
Mengyao Zhai, Jiacheng Chen, Ruizhi Deng, Ligeng Zhu, Lei Chen and Greg Mori
Under review in CVPR 2018

January 2018 **Colorize Color Images**.
Ligeng Zhu and Brian Funt
To appear in 30th Human Vision and Electronic Imaging Conference (HVEIC 2018).
Propose a method to improve color quality by colorizing it.

October 2016 **Attribute Recognition from Adaptive Parts**.
Luwei Yang, Ligeng Zhu, Yichen Wei, Shuang Liang and Ping Tan
In 27th British Machine Vision Conference (BMVC 2016)
An end-to-end deep learning approach to optimize parts detection for attribute recognition.

Research Experience

May 2017 – **Research Assistant**, *CVL Lab*, Simon Fraser University, Advisor: Prof.Brian Funt.
Research in deep learning and color vision
- Research on color vision with machine learning techniques.
- Contribution to Gehler's Dataset

May 2017 – Aug 2017 **Deep Learning Engineer**, TuSimple @ California, Mentor: Dr.Panqu Wang.
- (In a patent) Designed an algorithm that generates the road area from lidar cloud points.
- (In a patent) Designed vehicle back-light understanding system.
- Improved deep semantic segmentation model for real time scene parsing.

TuSimple Inc. is an unicorn startup aiming to achieve the first commercially viable autonomous truck driving platform with L4 (SAE) levels of safety.

Sept 2015 – May 2017 **Research Assistant**, *GruVi Lab*, Simon Fraser University, Advisor: Prof.Ping Tan.
Research in attribute recognition and 3D vision
- Designed an algorithm that optimizes localization for object detection (accepted by BMVC 2016).
- Contributed to *Garment Clothes*, a dataset with both attribute and localization.

Sept 2014 – Jan 2015 **Research Assistant**, *CAD & CG Lab*, Zhejiang University.
Research in computer graphics
- Implemented a image depth-detect algorithm
- Participated in the development of a material simulation system.

Talks and Teachings

Nov 2017 **SparseNets: Sparsely Aggregated Convolutional Networks**, SFU-UBC Vision Day.
Propose an architecture with better parameter efficiency compared to ResNets and DenseNets.

Oct 2017 **Deep Learning for Computer Visioners**, Simon Fraser University.
Two invited lectures for graduate course Computer Vision CMPT 412.

May 2017 **Neural Style Transformations Explained**, TuSimple.
The history, current progresses and mathematical analysis of neural style transform.

Dec 2016 **Deep Learning Live for Beginners**, Zhejiang University.
A deep learning introduction for university juniors majoring in computer science.

Honors and Awards

2017 **Open Source Scholarship**, Issued by Simon Fraser University.
To reward students who made a major contribution in an open source project.

2017 **Academic Scholarship**, Issued by Simon Fraser University.
Offered to students who show good academic behaviors.

2015 **ACM-ICPC Contest**, Issued by Zhejiang University.
Silver Prize

2015 **The Mathematical Contest In Modeling**, Issued by Zhejiang University.
First prize, ranking 3/143

Projects

2017 **MXBox: a toolbox for mxnet framework**, *GitHub*.
- Define preprocess as a transformation flow.
- Efficient and flexible DataLoader.
- Rich state-of-the-art models and their pretrained weights.

PS: MXBox is now available on PyPi.

2016 **Colorize gray-scale image using deep neural networks**, *Released model*.
- Implemented the state-of-the-art model, and accelerated training time from 3 weeks to 3 days.
- Introduced a simple feed-forward network for colorization task, which only requires 1/10 parameters while keeping competitive results to the state-of-the-art model.

2016 **Fast Artistic Stylization for Videos**, *Project page*.
Propose a coherent real-time style transfer for videos.
- Stable: unlike frame-by-frame transform, there is no artifact between frames.
- Fast: transformation with arbitrary styles can be achieved with 7 - 12 fps.

2016 **Chinese-English Translation System**, *Project page*.
- Implemented common basic utilities in NLP : segmentation, chunking, alignment and beam search.
- Implemented a traditional Phrase-Based translation with BLEU score 0.091.
- Implemented a seq2seq Neural Machine Translation approach with BLEU score 0.21.

2016 **Play with Multimedia**.
- Implemented RAW-to-JPEG converter with standard JPEG 2000.
- Implemented a simple video-gif converter based on GIF89 standardization.
- Built a image retrieval system with CNNs and reaches mAP 0.62 on Caltech 256 dataset.

2015 **An Efficient Ray-tracing Render Engine**.
- Most of modern render engine features - shadow, reflection, refraction, diffuse, super-sampling.
- Support reading from 3d texture file (SMF / OBJ).
- Used octree to avoid unnecessary intersection check, and openmp for parallel acceleration.