

Ligeng Zhu

Education

Massachusetts Institute of Technology, *Cambridge*, MA, USA.

Visiting student at Department of EECS. Prof. Song Han's group.

Simon Fraser University, *Vancouver*, BC, Canada.

B.Sc in Computing Science. Dual Degree Program exchange. GPA: 3.68/4.3 Major: 3.81/4.3

Zhejiang University, *Hangzhou*, Zhejiang, China.

B.Eng in Computer Science & Technology. GPA: 3.53/4.0 Major: 3.88/4.0

Publications

Neural Network Architectures

May 2019 **ProxlessNAS: Direct Neural Architecture Search on Target Task and Hardware.**

Cai Han, [Ligeng Zhu](#), Song Han

To appear in 7th International Conference on Learning Representations (ICLR 2019).

Sept 2018 **Sparsely Aggregated Convolutional Networks.**

[Ligeng Zhu](#), Ruizhi Deng, Michael Maire, Zhiwei Deng, Greg Mori and Ping Tan

In 15th European Conference on Computer Vision (ECCV 2018).

Colour Vision

Nov 2018 **Does Colour Really Matter? Evaluation via Object Classification.**

Brian Funt, [Ligeng Zhu](#)

In Proc. CIC 26th Color Imaging Conference (CIC 2018).

Sept 2018 **Colorization of Dichromatic Images.**

Brian Funt, [Ligeng Zhu](#)

In Proc. AIC 2018 International Colour Association Conference (AIC 2018).

Jan 2018 **Colorizing Color Images.**

[Ligeng Zhu](#) and Brian Funt

In 30th Human Vision and Electronic Imaging Conference (HVEI 2018).

Segmentation / Detection / Recognition

Preprint **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

arXiv preprint.

Jan 2019 **Small Object Sensitive Segmentation of Urban Street Scene with Consistent Spatial Adjacency Between Object Classes.**

[Ligeng Zhu](#)*, Dazhou Guo*, Yuhang Lu, Hongkai Yu and Song Wang (* denotes equal contribution)

To appear in IEEE Transactions on Image Processing (TIP 2019).

Oct 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).

Research Experience

Aug 2018 – **Research Assistant**, *HanLab*, MIT, Advisor: Prof. Song Han.

Now Efficient neural architecture search for hardware specialization

- Reduced the cost of Neural Architecture Search to the same level as regular training.
- Directly specialized neural network architectures for target task / hardware.

- Jan 2018 – **Research Intern**, *Video Segmentation Group*, SenseTime, Advisor: Dr. Jianping Shi.
- Aug 2018 Research on color stability through videos, and fix point inference
- (Pending Patent) Proposed an algorithm to reduce color variance under difference scenes.
 - Designed a quantization-aware loss that improves the accuracy under low-bit inference.
- May 2017 – **Research Assistant**, *CVL Lab*, Simon Fraser University, Advisor: Prof. Brian Funt.
- May 2018 Study color vision problems using deep learning technique.
- Proposed an algorithm to improve color quality using deep neural network.
 - Evaluated the importance of color via CNN based classification.
- May 2017 – **Deep Learning Engineer**, *Self-driving Group*, TuSimple @ USA, Mentor: Dr. Panqu Wang.
- Aug 2017
- (Patent) Designed an algorithm that generates the road area from lidar cloud points.
 - (Patent) Designed a vehicle tail-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 – **Research Assistant**, *GruVi Lab*, Simon Fraser University, Advisor: Prof. Ping Tan.
- May 2017 Research in attribute recognition and 3D vision
- Designed an algorithm that optimizes localization for object detection.
 - Contributed to *Garment Clothes*, a dataset with both cloth attribute and human pose.
- Sept 2014 – **Research Assistant**, *CAD & CG Lab*, Zhejiang University.
- Jan 2015 Research in computer graphics
- Implemented an image depth-detection algorithm
 - Participated in the development of a material simulation system.

Honors and Awards

- 2017 **Open Source Scholarship**, Issued by Simon Fraser University.
Rewarded to students who made a major contribution in an open source project.
- 2017 **Academic Scholarship**, Issued by Simon Fraser University.
Offered to students who are in excellent academic standing.
- 2015 **ACM-ICPC Contest**, Issued by Zhejiang University.
Silver Medal
- 2015 **The Mathematical Contest In Modeling**, Issued by Zhejiang University.
First prize, ranking 3/188

Projects

- 2018 **THOP: a flops counter of PyTorch framework**, [GitHub](#).
A toolbox that calculates the multiply-adds operation of PyTorch models.
PS: if you search with keywords (pytorch, flops, counter), THOP now ranks first on Google.
- 2017 **MXBox: a toolbox for MXNet framework**, [GitHub](#).
- Data preprocess as a transformation flow.
 - Efficient and flexible DataLoader.
 - Out-of-box state-of-the-art models.
- PS: MXBox is now available on PyPi. You can install through 'pip install mxbox'.
- 2016 **Colorize gray-scale image using deep neural networks**, [Project Page](#).
- 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](#).
Proposed a fast and coherent video style transfer.
- 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 an image retrieval system with CNNs and reaches mAP 0.62 on Caltech 256 dataset.