Guocheng Qian

Master in Computer Science (Deep Learning & Computer Vision)

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Education

King Abdullah University of Science and Technology (KAUST) — *Thuwal, Saudi Arabia*

Master in Computer Science, **GPA: 3.9/4.0** — *May 2019 - Dec 2020(expected)*

- Working at graph convolutional network (GCN), point cloud perception and self-supervised learning (SSL)
- Research assistant in Visual Computing Center, supervised by Prof. Bernard Ghanem

Xi'an Jiaotong University (XJTU, C9 League) — *Xi'an, Shaanxi, China*

B.Eng in Mechanical Engineering, **GPA: 3.9/4.0**, rank 1^{st} in Honors Engineer class — *Aug 2014 - Jul 2018*

- Participated in Japan-Asia Youth Exchange Program in Japan — *Feb 2018 - March 2018*
- Exchange Student at Hong Kong University of Science and Technology (HKUST) — *Feb 2017 - May 2017*

Selected Projects

SGAS: Sequential Greedy Architecture Search (CVPR20) — *IVUL, KAUST*

[paper] [code] [project] — ***CVPR20***

- Architectures with a higher validation accuracy during the search phase may perform worse in the evaluation. Introduce sequential greedy architecture search (SGAS) to alleviate this common issue.
- As the co-first author, I implemented the whole code for GCN architecture search. It is **the first GCN-NAS framework**. Code >120 stars.

DeepGCNs: Making GCNs Go as Deep as CNNs — *IVUL, KAUST*

[paper] [code] [project] — ***TPAMI20*** *under Major Revision*

- Transfer concepts such as residual connections and dilated convolutions from CNNs to GCNs and successfully train very deep GCNs.
- As the co-first author, I **contributed a graph convolution library (torchgcn)** for processing various format of data (point cloud, mesh and general graphs) and implemented > 90% the **PyTorch code of DeepGCNs** for point cloud classification, semantic segmentation and part segmentation, and graph node (semi-)classification. >500 stars.

PU-GCN: Point Cloud Upsampling using Graph Convolutional Networks — *IVUL, KAUST*

[paper] [code] [project] — *Under Review*

- As the first author, I proposed and implemented GCN based upsampling modules and multi-scale feature extractors for point cloud upsampling.
- My proposed point upsampling piple PU-GCN outperforms the SOTA with much less parameters and faster inference.

Adversarial Self-Supervised Learning on Point Clouds — *IVUL, KAUST*

In Progress — *Expect to submit to ICCV21*

- Aimed at self-supervised learning (SSL) on point clouds perception.
- As the principal for the ongoing project, I will present a novel effective self-supervised method named adversarial SSL.

Blind Spot GCN for High Quality Image Denoising in the wild — *IVUL, KAUST*

In Progress — *Expect to submit to ICCV21*

- Aimed at improving the image denoising quality of self-supervised image denoising in the wild.
- As the principal for this ongoing project, I will present a new network called blind-spot GCN for high-quality self-supervised image denoising.

Internship

SenseTime Research — *Shenzhen, China*

Computer vision researcher, directed by Dr. Jimmy S. Ren (R&D Director) — *July 2018 - May 2019*

- I proposed to rethink ISP pipeline, designed a new architecture TENet and contributed a fully color sampled dataset PixelShift200 to improve the quality of the sensor raw image enhancement. Project page.
- First authored Paper (Trinity of Pixel Enhancement: a Joint Solution for Demosaicking, Denoising and Super-Resolution). Code >140 stars. I am collaborating with Prof. Wolfgang Heidrich to improve this preprint version. Paper is in review for a recent conference.

Honors & Awards & Contest Prize

Outstanding Undergraduate	top 10 out of 19,000 undergraduates, highest undergraduate honor
National Scholarship	top 1%, most prestigious (first-class) national scholarship in China.
KAUST Fellowship	70,000$/year that supports my Masters' study at KAUST.
Excellent Student Cadre	top 3%. Awarded to undergraduate student with leadership
Meritorious Winner	Awarded in International Mathematical Modeling Contest, 2016. (Top 5% among thousands of competitors)
National First Prize	Awarded in National Digital Mechanical Product Design Contest, 2016. (top 5% among 700 participants)
National Second Prize	Awarded in National Undergraduate Electronic Design Contest, 2016. (top 5% among 40,000 participants)

Skills & Social Service

Programming	**PyTorch**: SGAS >100 stars, DeepGCNs >500 stars, TENet >140 stars **Tensorflow**: PU-GCN (), GraphEmbedding() **Large scale GPU usage**: distributed training experience using multiple V100s **C++, CUDA**: Course project on OpenGL-CUDA based image processing (), Course project on OpenMesh based curvature estimat **MATLAB**: over 10,000 lines experience (mathematical modeling, image processing, 3d reconstruction)
Blog	I write random stuff on deep learning from time to time. Link.
Teaching Assistant	CS390D Deep Learning (2020 Spring)
Reviewer	AAAI21

GPA & Standard Test

GPA in Undergraduate	3.9/4.3
GPA in Master	3.9/4.0
TOEFL iBT	99 (24 Reading, 27 Listening, 22 Speaking, 26 Writing). Test in 2018. Will update soon.

Publications

See also at Google Scholar.

- **Guocheng Qian**, Abdulellah Abualshour, Guohao Li, Ali Thabet, and Bernard Ghanem. "PU-GCN: Point Cloud Upsampling using Graph Convolutional Networks." arXiv preprint arXiv:1912.03264 (2019). [Under review] [Paper] [code].
- **Guocheng Qian**, Jinjin Gu, Jimmy S. Ren, Chao Dong, Furong Zhao, and Juan Lin. "Trinity of Pixel Enhancement: a Joint Solution for Demosaicking, Denoising and Super-Resolution." arXiv preprint arXiv:1905.02538 (2019). [Under review] [Paper] [code].
- Guohao Li*, **Guocheng Qian***, Itzel C. Delgadillo*, Matthias Muller, Ali Thabet, and Bernard Ghanem. "Sgas: Sequential greedy architecture search." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR20**), pp. 1620-1630. 2020. [Paper] [code].
- Guohao Li*, Matthias Müller*, **Guocheng Qian***, Itzel C. Delgadillo, Abdulellah Abualshour, Ali Thabet, and Bernard Ghanem. "Deepgcns: Making gcns go as deep as cnns." arXiv preprint arXiv:1910.06849 (2019). [**TPAMI20** under Major Revision] [Paper] [code].
- Sicheng Chen, **Guocheng Qian**, and Lei Yang. "Precise control of surface texture on carbon film by ion etching through filter: Optimization of texture size for improving tribological behavior." Surface and Coatings Technology 362 (2019): 105-112.