Qin Yang

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Shanghai, 200240, P.R. China

EDUCATION

Ph.D. in Computer Science and Technology Sep.2017 – Present
Shanghai Jiao Tong University (SJTU), Shanghai, China
Advisor: Prof. Junni Zou

B.Eng. in Electronic and Information Engineering Sep. 2013 - Jul. 2017
University of Electronic Science and Technology of China (UESTC), Chengdu, China
Major GPA: 3.94/4, Rank: 13/350
Top 1% Excellent Bachelor Thesis
Excellent Graduate Award of UESTC

RESEARCH INTEREST

VR/360°/Point Cloud Vision
Understanding to the Signals on Non-Euclidean Domains
Graph Neural Network
Deep Reinforcement Learning

PUBLICATION

[1] **Qin Yang**, Junni Zou, Kexin Tang, Chenglin Li, Hongkai Xiong, "Single and Sequential VIEWPORTS Prediction for 360-Degree Video Streaming", *IEEE Int'l Symposium on Circuits & Systems (ISCAS'2019)*, Sapporo, Japan, May 2019. (Oral)
[2] **Qin Yang**, Guo-Jun Qi, Wenrui Dai, Yuhui Xu, Junni Zou, Hongkai Xiong, "Rotation Equivariant Graph Convolutional Network for Spherical Image Classification". **submitted** to In *Proceedings of the IEEE conference on computer vision and pattern recognition (CVPR'2020)*.
[3] **Qin Yang**, Guo-Jun Qi, Junni Zou and Hongkai Xiong, "Multi-agent Deep Reinforcement Learning based on Graph Convolutional Networks for Traffic Signal Control". **prepared** for *European Conference on Computer Vision* (*ECCV'2020)*.
[4] Junni Zou, Chenglin Li, Chengming Liu, **Qin Yang**, Hongkai Xiong, Eckehard Steinbach, "Probabilistic Tile Visibility-Based Server-Side Rate Adaptation for Adaptive 360-Degree Video Streaming", accepted by *IEEE Journal of Selected Topics in Signal Processing(JSTSP'2019)*.
[5] Chengming Liu, Nuowen Kan, Junni Zou, **Qin Yang**, Hongkai Xiong, "SERVER-SIDE RATE ADAPTATION FOR MULTI-USER 360-DEGREE VIDEO STREAMING",accepted by *IEEE International Conference on Image Processing(ICIP'2018).*

SELECTED HONOR AND AWARD

Excellent Graduate Award of UESTC	2017
The Top 1% Excellent Thesis Award of Bachelor Degree of UESTC	2017
National Encouragement Scholarship of UESTC	2013&2014&2015
Honorable Mention of Mathematical Contest in Modeling (MCM/ICM)	2016

ACADEMIC ACTIVITY

Reviewer for *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*
Volunteer for the 10th *International Conference on Image and Graphics*

RESEARCH EXPERIENCE

Study of Users' Behavior in 360-Degree Video

- We develop a single viewport prediction model using convolutional neural network (CNN), in which the pooling layers are dropped and more convolutional layers are added for stronger nonlinear fitting ability.
- Further, we design a viewport trajectory prediction model based on recurrent neural network (RNN) which learns long-term dependency in sequential viewports. Specially, it is capable to estimate future viewport trajectory and support variable-size prediction window with low complexity.
- Finally, a correlation filter-based viewport tracker (CFVT) is proposed to perform content-aware viewport prediction. The combination of the RNN and the CFVT through a fusion model enables them to complement each other which is validated by significant improvement in prediction accuracy.

Rotation Equivariant Graph Convolutional Network for Spherical Image Analysis

- We present a graph convolutional network to encode rotation equivariant representation and achieve state-of-the-art performance on the spherical images classification.
- We develop a graph convolutional layer through exploring the isometric transformation equivariance of the graph Chebyshev polynomial filters, a hierarchical pooling layer to exploit the multi-scale resolutions of the spherical images and keep the rotation-equivariance, and a transition layer to calculate the rotation-invariant statistics across multiple feature maps of the hierarchical pooling layer.

Multi-agent Deep Reinforcement Learning for Large-scale Traffic Signal Control

- We apply the graph neural network to learn the communication between agents, since the road networks can be naturally represented as directed graphs. We also design a sequence encoder to extract features from the past states.
- The spatial attention and temporal attention mechanism are introduced to stabilize the learning procedure by combining the spatial observability and temporal observability.