ZHIQI CHEN

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Education

New York University — New York
PhD candidate in Electrical and Computer Engineering, GPA 3.9 — *Sept. 2018 – Present*

Beijing University of Aeronautics and Astronautics — Beijing
B.S. in Biomedical Engineering, GPA 3.7 — *Sept. 2014 – Jun. 2018*

Publications

- **Zhiqi Chen**, Ran Wang, Haojie Liu, Yao Wang; PDWN: Pyramid Deformable Warping Network for Video Interpolation; arXiv preprint arXiv:2104.01517
- **Zhiqi Chen**, Hiroshi Ishikawa; Artificial Intelligence in Ophthalmology. Spring Nature. Chapter 5 and 10. (under review)
- **Zhiqi Chen**, Ronald Zambrano, Gadi Wollstein, Joel S Schuman, Hiroshi Ishikawa; OCT Denoising Performance Comparison on 2D and 1D Approaches. Invest. Ophthalmol. Vis. Sci. 2021. (Accepted as meeting abstract)
- **Zhiqi Chen**, Yao Wang, María de los Angeles Ramos-Cadena, Gadi Wollstein, Joel S Schuman, Hiroshi Ishikawa; Predicting Macular Progression Map Using Deep Learning. Invest. Ophthalmol. Vis. Sci. 2020;61(7):4532. (Meeting abstract)
- **Zhiqi Chen**, Yao Wang, Gadi Wollstein, Maria de los Angeles Ramos-Cadena, Joel S. Schuman, Hiroshi Ishikawa (2020). "Macular GCIPL Thickness Map Prediction via Time-Aware Convolutional LSTM." In 2020 IEEE International Symposium on Biomedical Imaging (ISBI). IEEE, Conference Proceedings, in press.

Projects

A Feature-Agnostic Way to Estimate Point-Wise Visual Fields from OCT images

Supervisor: Dr. Hiroshi Ishikawa — *NYU Langone*

- A deep learning model to estimate point-wise visual fields (VFs) directly from OCT images.
- Built a shared 3DCNN to extract features from raw macular and optic nerve head OCT images and two fully connected layers to estimate point-by-point VFs.
- Achieved accuracy of 4.47 dB for root mean square error compared to 6.00 dB of other deep learning methods based on OCT thickness maps. (Manuscript under preparation)

PDWN: Pyramid Deformable Warping Network for Video Interpolation

Supervisor: Prof. Yao Wang — *Video Lab, NYU*

- A compact and accurate model to upconvert video frame rate by generating realistic intermediate frames given video sequences.
- Modeled object motion and appearance by local offsets, local attentions, and global filters of deformable convolution.
- Designed a pyramid structure to generate offsets, attention, and filters of middle frames w. r. t. the known frames through coarse-to-fine successive refinements so as to address large motions.
- Warped deep features in every pyramid level and calculated cost volumes to help the inference.
- Achieved better or on-par accuracy compared to SOTA on multiple datasets with substantially fewer parameters and inference time.
- Submitted a manuscript to the IEEE Open Journal of Signal Processing. (minor revisions before acceptance)

Video Prediction through Dynamic Deformable Filter Network

Supervisor: Prof. Yao Wang — *Video Lab, NYU*

- A deep learning model to predict future frames given prior frames.
- Built a Dynamic Deformable Filter Network (DDFN) to generate sample-specific filters and offsets for input frames to address motion variety and large displacement.
- Demonstrated significant 1.4 dB PSNR gain of DDFN with 3×3 convolution configuration compared to Dynamic Filter Network with 9×9 convolution configuration (DFN).

Macular GCIPL Thickness Map Prediction via Time-Aware Convolutional LSTM
Supervisor: Dr. Hiroshi Ishikawa & Prof. Yao Wang *NYU Langone*

- A Time-Aware Convolutional LSTM to predict next-visit GCIPL thickness maps based on past four visits.
- Designed a time gate to address sampling interval variety by decomposing memories into the short-term and long-term memories and penalizing the short-term memories.
- Performed a subjective evaluation and demonstrated the superiority of the proposed model over standard convolutional LSTM by 3 ophthalmologists preferring the proposed approach for over 90% of test sets.
- Accepted as a paper in 2020 IEEE International Symposium on Biomedical Imaging (ISBI).

Skills

Languages: Python (proficient), MATLAB (proficient), Java (familiar), C/C++ (familiar)
Human Languages: Chinese , English
Developer Tools: Pytorch, Tensorflow, Git