ZHIQI CHEN

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Education

New York University Sept. 2018 – Aug. 2023 (expected)
Ph.D. candidate in Electrical Engineering, GPA 3.88 *New York*

Beihang University (BUAA) Sept. 2014 – Jun. 2018
B.S. in Biomedical Engineering, GPA 3.7 *Beijing*

Skills

Programming Languages: Python, C/C++, Java, MATLAB
Tools & Frameworks: Git, PyTorch, Tensorflow, Keras, GCP/AWS
Languages: Chinese, English

Work Experience

Amazon Robotics Jun. 2022 – Aug. 2022
Applied scientist intern *Greater Boston*

- Developed a monocular depth estimation algorithm to replace stereo depth sensors with RGB sensors for robotic manipulation.
- Utilized both local and global geometry constraints to improve depth estimation quality significantly.
- Tested the algorithm in real package picking settings and achieved 12mm error for pick depths.

Philips Research May 2021 – Aug. 2021
Computer vision engineer intern *Cambridge*

- Developed a motion correction algorithm for liver ultrasound image sequences using MATLAB.
- Implemented, optimized, and validated different algorithms for a series of tasks including automatic region-of-interest selection, active object tracking, and automatic threshold selection.
- Drafted an invention disclosure for the designed framework which could potentially be commercialized on Philips' next-generation premium ultrasound scanner.

Projects

PDWN: Pyramid Deformable Warping Network for Video Interpolation (Python, PyTorch)

- A compact and accurate deep learning model to upconvert video frame rate by generating realistic intermediate frames given video sequences.
- Designed a pyramid structure to generate deformable convolution kernels, which modeled object motion and appearance, through coarse-to-fine successive refinements so as to address large motions.
- Applied deep feature warping and cost volume calculation in the pyramid to help the inference.
- Achieved 0.53 dB PSNR gain with a model size that is only 5.8% of that of the state-of-the-art model.
- Accepted as a paper in the IEEE Open Journal of Signal Processing. Demo available.

Macular GCIPL Thickness Map Prediction via Time-Aware Convolutional LSTM (Python, PyTorch)

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

Interactive 2D Editor for Vector Graphics (C++)

- An interactive application that allows to add, edit, delete, and rasterize triangles. Demo available.
- Built functions to apply transforms like translation, rotation, and scale to selected primitives and view transformations.
- Implemented interpolations between key frames to generate animations.

Publications

- **Zhiqi Chen**, Eitan Shemuelian, Lei Zheng, Gadi Wollstein, Yao Wang, Hiroshi Ishikawa, Joel S Schuman; ”Segmentation-Free OCT-Volume-Based Deep Learning Model ImprovesPoint-Wise Visual Field Threshold Estimation.” Invest. Ophthalmol. Vis. Sci. 2022.
- Haojie Liu, Ming Lu, **Zhiqi Chen**, Xun Cao, Zhan Ma, Yao Wang,”End-to-end Neural Video Coding Using a Compound Spatiotemporal Representation.” in IEEE Transactions on Circuits and Systems for Video Technology. (in revision)
- **Zhiqi Chen**, Ran Wang, Haojie Liu and Yao Wang, ”PDWN: Pyramid Deformable Warping Network for Video Interpolation.” in IEEE Open Journal of Signal Processing, vol. 2, pp. 413-424, 2021.
- **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.
- **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.
- **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.