Bo Liu

boliu0303@gmail.com · (+86) 188-1020-8693

Education

Beihang University (BUAA), Beijing, China 09/2018 – Present

M.S. in Computer Science and Technology Expected graduation: 01/2021

- Lab: State Key Laboratory of Virtual Reality Technology and Systems
- Research Area: Computer Vision, Medical Image Analysis
- Advisor: Prof. Feng Lu & Dr. Lin Gu

Xidian University (XDU), Shaanxi, China 09/2014 – 06/2018

B.S. in Computer Science and Technology

- GPA: 3.8 (87.7 / 100)
- Ranking: 2 / 186 (top 2.0%)

Research Experiences

Retinal Vessel Descriptor Exploration 12/2019 – 2020/03

Student Researcher State Key Laboratory of Virtual Reality, Beijing, China

- Proposed a descriptor to statistically characterize the vessel structure and blood circulation and associated it with eye diseases.
- Introduced fluid mechanics to estimate the blood flow and pressure from vessel structure.
- Identified the most relevant vessel characteristic feature is pressure via Shapley Additive Exlanations (SHAP).

Retinal Vessel Segmentation 03/2018 – 2018/09

Visiting Student Researcher National Institute of Informatics, Tokyo, Japan

- Proposed an self-supervised ensemble strategy for retinal vessel segmentation.
- Implemented a no-reference network for retinal vessel segmentation quality assessment.
- Trained the no-reference network to regress the similarity between degraded vessel tree and the manually segmented via Normalized Mutual Information (NMI).
- Optimized ensemble weight of individual method to maximize the no-reference segmentation quality of final segmentation according to the back-propagated gradient.
- Conducted extensive comparison with existing methods on three datasets and achieved state-of-the-art performance with highest F1-score.

Publications

First Author (Medical Image Analysis):

- **Bo Liu**, Lin Gu, Shancheng Zhang, Yuhao Niu, Feng Lu. What's in the Vessel: A Novel Vessel Structure Descriptor for Fundus Disease Analysis. (In Preparation)
- **Bo Liu**, Lin Gu, Feng Lu. Unsupervised Ensemble Strategy for Retinal Vessel Segmentation. *Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019.*

Participating:

- Feifan Lv, **Bo Liu**, Feng Lu. Fast Enhancement for Non-Uniform Illumination Images using Light-weight CNNs. *ACM Multimedia (ACM MM), 2020.*
- Mingjing Ai, Guozhi Shan, **Bo Liu** and Tianyang Liu. Rethinking ReID: Multi-Feature Fusion Person Re-identification Based On Orientation Constraints. (Under Review by ICPR 2020)
- Wenhan Yang, Ye Yuan, Wenqi Ren, ..., **Bo Liu**, et al. Advancing Image Understanding in Poor Visibility Environments: A Collective Benchmark Study. *IEEE Transactions on Image Processing (TIP), 2019.*

- Yanjie Lian, Huifang Ma, Wang Li, ..., **Bo Liu**. Study on the Rule of Prescription of Alopecia in Tang and Song Dynasty. *Chinese Medicine Modern Distance Education, 2018.* (In Chinese)

PROJECTS

Fatigue Detection for Air Traffic Controller 06/2020 – Present

Project Leader Peng Cheng Lab, Shenzhen, China

- Detected abnormal and fatigued working conditions of air traffic controllers to avoid human errors.
- Optimized the face landmark detection model and blink judgement strategy in low light and high angle scene based on collected video.

Gaze Correction in Video Call 08/2019 – 12/2019

Algorithm Researcher Huawei Technologies Co., Ltd., Beijing, China

- Adjusted the appearance of eyes to make users appear to be looking straight at the camera in a video call via Inverse Distance Weighting (IDW) algorithm.
- Proposed a model for automatic correction according to device deflection angle and face-camera distance.
- Reduced the eye jitter by 95% by proposing the evaluation metric and optimizing weight policy in IDW.

Video Stitching 05/2019 – 08/2019

Project Leader Beijing Electronics Holding Co., Ltd. (BEHC), Beijing, China

- Stitched three-way real-time camera videos into one big scene video via SIFT.
- Reduced color differences after splicing through channel averaging.
- Accelerated the stitching speed 100 times by reducing exchange between memory and GPU.
- Achieved real-time (25fps) stitching with good visual perception.

SKILLS

- English: CET-4: 618 / CET-6: 512 / IELTS: 6.5
- Coding: Python / C++ / Matlab
- Image Processing: Deep Learning / Pytorch / OpenCV
- Interests: Photography / Powerpoint Design

HONORS

- Huawei Scholarship (selected 2 among 300 students), 2020.
- National Scholarship (top 1%), 2018 & 2016.
- National Scholarship for Encouragement (top 3%), 2017.
- Graduate Student Travel Award of MICCAI, 2019.
- Outstanding Graduate Student of Xidian University, 2018.
- Meritorious Winner of Interdisciplinary Contest in Modeling (top 10%), 2017 & 2016.

SUMMARY

- Personality: Optimistic / Persistent / Can well connect and understand others.
- Career Plan: To be an expert in 10 years.