Yuanzhi Liang

Contact Information

Web: http://liangyzh.com
Mail: liangyzh13@stu.xjtu.edu.com
Tel: +86-188-4081-8096
Kaggle page: https://www.kaggle.com/risotto

Education

Xi'an Jiaotong University, Xi'an, China
- M.S., Software Engineer, Jun. 2020
- Advisors: Xueming Qian and Zhu Li
- GPA: 88.89 / 100

Lanzhou University, Lanzhou, China
- B.S., Electronic Engineering, Jul 2017
- GPA: 4.43 / 5

Honors

- **First** place in iMat Product Competition @ CVPR 2019 FGVC6 workshop
- **First** place in Fieldguide Challenge: Moths & Butterflies @ CVPR 2019 FGVC6 workshop
- **Second** place in iFood Competition @ CVPR 2019 FGVC6 workshop
- **First** Prize Scholarship (2013 in LZU)
- **Second** Prize Scholarship (2015 in LZU)
- **Third** Prize Scholarship (2014 in LZU)
- **First** Prize Scholarship (2017 in XJTU)
- **Meritorious Winner** in Interdisciplinary Contest in Modeling (ICM) 2016
- **National Third Prize** in National Undergraduate Internet Innovation and Application Design Contest 2016
- **Provincial Second Prize** in National Undergraduate Electronic Design Contest 2015

Publications

1. **Yuanzhi Liang**, Yalong Bai, Wei Zhang, Xueming Qian, Li Zhu and Tao Mei. "VrR-VG: Refocusing Visually-Relevant Relationships".

   Accepted to ICCV 2019.

   Dataset website: http://vrr-vg.com

2. **Yuanzhi Liang**, Zhu Li, and Xueming Qian. "Counting Passengers in Railway Compartment Surveillance Video".

   Submitted to TOMCCAP.

3. **Yuanzhi Liang**, Rong Ma and Yide Ma. "A Size Self-adaptive Method For RBCs Counting From Different Blood Smears Based On PCNN And Image Quality".

   Accepted by BIBM 2016.

Research Interests

Visual Relationships Detection and Scene Graph Generation; Fine-grained Classification; Face Recognition; Crowd Counting

Engineering Capability

Programming Language: Python, Matlab, C/C++, Java

Framework: pytorch, tensorflow, mxnet

Research Experience

JD AI Research, Image Understanding, Beijing, China

Research Intern Aug. 2018 – Jun. 2019

(Advised by Yalong Bai and Wei Zhang)

- Visual Relationships: Representation and Applications in Cognitive Tasks
  - Constructed **Visually-relevant Relationships Dataset (VrR-VG)** to reduce the predictability of visual relationships by data bias and prior knowledge, and boosted performances of cognitive tasks by providing more valuable interaction knowledge of instances in the scene. A novel method was proposed to distinguish the visually-relevant relationships for VrR-VG.
  - Explored **image representation learning with visual relationships**. Both of the categorical knowledge including locations, attributes of single objects and the inter-action relationships among multiple objects in the images are considered for learning representations.
  - Studied visual relationships applications in **cognitive tasks** like visual question answering and image captioning. With visual related applications, boosted the ability of features in expressing inter-instance interaction of scenes, which perform better in cognitive tasks.
  - Studied **scene graph generation** and evaluated state-of-the-art methods. Working on a novel method to avoided quadratic time complexity in relation representation, which also adapted to various detection backbones.
- Fine-grained image recognition research.
  - Refactored and improved DCL method (Destruction and Construction Learning for Fine-grained Image Recognition, CVPR 2019) to work on competitions in CVPR 2019 FGVC6 workshop. Improved 0.2% - 0.6% top3 accuracy of baseline methods in iMat product, Moths & Butterfly and iFood datasets
  - Maintaining open source code of DCL in `https://github.com/JDAI-CV/DCL`

XJTU, Key Laboratory for Intelligent Network and Network Security, Xi'an, China

Sep.2017 - Jul.2018

(Advised by Xueming Qian)

- Passenger Analysis in Highway Compartment Surveillance Video.
  - The project was supported by CRRC Corporation Limited. The research topic is about **semi-supervised passengers detection and counting**. With surveillance videos in highway compartment, designed annotation methods and plans at minimum cost. Proposed a semi-supervised method with the CNN encoder and the post-processing module including Hebb learning module and Kalman filter. Adjusted annotations and methods to get better performances.
- Face detection and recognition.
  - Targeting at solving **occluded face** in surveillance video, researched related methods and validated performances (data from China Graduate Contest on Smart-city Technology and Creative Design). Explored and designed a system with face detection (SFD, FAN), face recognition (SphereFace, CosFace, ArcFace), face alignment (dlib and opencv API), occluded face segmentation (Watershed Algorithm, FCN based model) and occluded face completion (CycleGAN).

LZU, Laboratory for Electronics and Communications Engineering, Lanzhou, China

Sep.2015 - Aug.2017

(Advised by Yide Ma and Kun Zhan)

- Pulse Coupled Neural Network (PCNN) based Red Blood Cells (RBCs) Counting.
  - Worked on **RBCs counting** via microscope images. Extracted the contours of RBCs based on the pixel quality of a binary mask from PCNN. The Circular Hough Transform (CHT) for different amplifications was used for self-adapting multiple scales of RBCs.
- PCNN based Image Representation and Classification.
  - Studied **image classification** (datasets: Caltech 101, CIFAR-100) by encoding the distributions of PCNN masks. Applied the PCNN outputs in different time series to extract image features, and utilized the PCNN in image representation.

Others

- Bachelor's Period: Explored time series prediction in traffic flow (Wavelet Neural Network (WNN)). Created color ring resistors recognition system based on image processing (PCNN, SIFT).
- Participated in the Sales Forecasting of Supply Chain Project in JD. (sales forecasting with LSTM)
- As a director, completed one National Innovation and Entrepreneurship Training Program in 2016. The project was about prediction and control system of traffic flow in urban road networks.
- As a director, completed one LZU Innovation and Entrepreneurship Training Program in LZU in 2014. The project was about traffic navigation system.
- As a member, completed National Innovation and Entrepreneurship Training Program in 2016 about Through-the-Wall Radar Imaging. Completed another LZU Innovation and Entrepreneurship Training Program in 2015 about the control system in robotic grasping.