LIANGZI RONG

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EDUCATION

Tsinghua University, School of Software Beijing, China
M.Eng. in School of Software Aug 2017 – Jun 2020

- GPA: 3.49/4.00
- Research Interest: Machine Learning Applications, Computer Vision for Crowd Counting.
- Selected Courses: Literature Review and Thesis Proposal 4.0; Machine learning and knowledge discovery 3.6; Data Warehouse and Data Mining 3.6; Large-Scale Multimedia Information Management and Retrieval 3.6.

Tsinghua University, Department of Automation Beijing, China
B.Eng. in Department of Automation Sept 2013 – Jun 2017

- GPA: 87/100
- Admitted on basis of top2 students out of more than 400,000 students in Hebei Province on National College Admissions Exam.
- Selected Courses: Introduction to Systems Engineering 99; Probability and Statistics 91; Calculus A (1) 90; Linear Algebra (1) 91; Data Structure 91.

RESEARCH EXPERIENCE

Tsinghua University (School of Software) Beijing, China
Advisor: Associate Prof. Chunping Li, School of Software, Tsinghua University Jan 2020 – Now
From Coarse to Fine: Multi-level Attention Refined UNet and Multi-scale Structural Loss for Crowd Counting (will submit to BMVC2020)

- In this paper, we combine plain UNet with multiple supervisions to guide internal layers to learn more semantic information and to produce high quality density maps. We further construct Multi-level Attention Refined UNet (MARUNet) by introducing an attention branch to suppress the influence of background and reduce false recognition on multi-scale.
- We propose a simple yet effective loss function named Multi-scale Structural Loss (MSL) considering both structural similarity and counting accuracy. Extensive experiments on multiple datasets report state-of-the-art or competitive performance and validate the effectiveness of proposed MARUNet and MSL.

Tsinghua University (School of Software) Beijing, China
Advisor: Associate Prof. Chunping Li, School of Software, Tsinghua University Jun 2019 – Nov 2019
Adaptive Depth Network for Crowd Counting and Beyond (accepted by ICME Workshop 2020)

- Studied existing methods and found that these works cannot handle the density and scale variation problem among images well. An experiment was conduct to demonstrate that in crowd counting task, layers of different depths in one CNN excel in dealing with different images with varying features.
- Propose a novel network structure that have a multi-output structure and can exploit the representation ability of internal layers better. The network also incorporates extra selecting branches to estimate confidence values. Each output branch and selecting branch form one branch pair where the confidence value of the selecting branch reflects the proximity of the output to ground truth. The output with the best confidence value is selected out as the final result.

Tsinghua University (School of Software) Beijing, China
Advisor: Associate Prof. Chunping Li, School of Software, Tsinghua University Nov 2019 – Jan 2020
A Strong Baseline for Crowd Counting and Unsupervised People Localization (submit to IJCAI2020)

- In this paper, we explore a strong baseline for crowd counting and an unsupervised people localization algorithm based on estimated density maps. Firstly, existing methods achieve the state-of-the-art performance based on different backbones and kinds of training tricks. We collect different backbones and training tricks and evaluate the impact of changing them and develop an efficient pipeline for crowd counting, which decreases MAE and RMSE significantly on multiple datasets.
- We also propose a cluster algorithm named isolated KMeans to locate the heads in density maps. This method can divide the density maps into subregions and find the centers under local count constraints without training any parameter and can can be integrated with existing methods easily.

Tsinghua University (Department of Automation) Beijing, China
Advisor: Associate Prof. Jianming Hu, Department of Automation, Tsinghua University Mar 2016 – Jun 2016
Traffic Flow Data Prediction, Compression and Clustering

- Predicted the real life traffic flow data in specific intersections using ill-conditional linear regression.
- Compressed the original data by adopting Black-box modeling with rate of 52% and precision of 95%.

- Explored the correlation of one intersection with the nearby ones in traffic flow tendency by using K-means, Mean Shift and APriori cluster algorithms.

Work Experience

Megvii Beijing, China
Research Intern, Video Group May 2019 – Jun 2019
- Explored the representation ability of different layers in CNN and boost the performance in a combining way in crowd counting task.

Siemens Beijing, China
Develop Intern May 2018 – May 2019
- Electricity consumption prediction and abnormal power usage behavior detection. Developed the front pages using Angular2 and Bootstrap4.

HT Acoustics Beijing, China
Develop Intern Jun 2016 – Aug 2016
- Improved the design of filter for the purpose of active noise reduction, and conducted the preliminary circuit implement.

Selected Awards and Honors

- The Second Prize Scholarship for Freshmen (top2 in Hebei Province), Tsinghua University 2013
- The First Prize Scholarship (VMware scholarship) of School of Software, Tsinghua University 2019
- Scholarship for Academic Excellence (top 15%), Tsinghua University 2016
- Outstanding Graduate of Department of Automation (top 30%), Tsinghua University 2017
- The Third Prize of Comprehensive Excellence in School of Software, Tsinghua University 2018
- Annual School-Level Voluntary Award of Excellence 2015&2016
- Annual School-Level Award of Sports Excellence 2014&2015&2106
- Annual School- Level Award of Excellence in Practice 2014&2015

Additional Information

Extracurricular Experiences
- Teaching Assistant, Cloud Data Management (2)(44100445-0) Fall 2019
- Second Prize in Emergency Big Data Datathon Contest (2/30, “Study on Construction of Short-term Therapeutic Effect Prediction Model for Acute Hyperlactatemia Based on Emergency Big Data”) March 2018
- Counselor, International Freshmen Camp, Tsinghua University Aug 2017 - Sept 2017
- President, Student Marathon Association, Tsinghua University Feb 2016 - Feb 2017
- Participator, Data Castal, ranked 21 out of 1201 Mar 2019
- Participator, Data Fountain, ranked 71 out of 816 Sept 2018 - Nov 2018

Computer Skills and Language
- Python (mainly used), Pytorch, C++, Matlab, Java.
- IELTS 7.0 (Reading 8.0, Listening 7.5, Writing 6.5, Speaking 5.5)