

Curriculum Vitae

Personal Profile

Name	Yabei Li
Sex	Female
Date of Birth	10 September 1993
Nationality	China
Education	Ph.D Candidate, Institute of Automation, Chinese Academy of Sciences
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Education

Sep 2014-present	National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, China <i>M.D-Ph.D of Patter Recognition and Intelligent System, expected graduate in July 2019</i>
Sep 2010-Jun 2014	Department of Electrical Engineering, Hefei University of Technology, Anhui, Hefei, China <i>Bachelor of Electrical Engineering</i>

Research Interests

2D/3D Scene Understanding; Object Recognition; Multi-Modal Feature Extraction and Learning; Deep Learning.

Research Experience

Scene Specific Pedestrian Detection

The pedestrian detectors trained on popular datasets like Caltech, KITTI get excellent precision on these datasets' test set. However, it cannot be applied well in practical, for example in surveillant scenes. I propose a deep learning architecture to automatically adapt general pedestrian detector to specific surveillant scene. The proposed method can transfer the detector in unsupervised way and ease the domain shift problem by utilizing the temporal cues.

RGB-D Indoor Scene Segmentation

The RGB and Depth cues are complementary for semantic segmentation. The RGB modal gives color cues while the Depth modal provides geometric cues that are robust to lights and occlusion. Traditional methods usually apply two-stream convolutional neural networks (CNNs) to represent RGB and depth images respectively, and fuse the two streams on a specific layer. I find such a single-layer fusion method cannot exploit the complementary RGB and depth cues well for semantic segmentation. The low-level fusion suffers from semantic gap and the high-level fusion loses the spatial information. To address this problem, we propose a novel Semantics-guided Multi-level feature fusion architecture, which first learns deep feature representation from bottom to up, and then gradually fuses the RGB and depth features from high level to low level under the guidance of the semantic cues.

DF²Net for RGB-D Indoor Scene Classification

RGB-D Scene Classification is a very challenging task due to two folds. 1) Learning robust representation for indoor scene is difficult because of various objects and layouts. 2) Fusing the complementary cues in RGB and Depth is nontrivial since there are large semantic gaps between the two modalities. Most existing works learn representation for classification by training a deep network with softmax loss and fuse the two modalities by simply concatenating the features of them. However, these pipelines do not explicitly consider intra-class and inter-class similarity as well as inter-modal intrinsic relationships. To address these problems, we propose a Discriminative Feature Learning and Fusion Network (DF²Net) with two-stage training. In the first stage, to better represent scene in each modality, a deep multi-task network is constructed to simultaneously minimize the structured loss and the softmax loss. In the second stage, we design a novel discriminative fusion network which is able to learn correlative features of multiple modalities and distinctive features of each modality.

MAPNet for RGB-D Indoor Scene Classification

Although convolutional neural network (CNN) achieves excellent results on RGB-D object recognition, it has several limitations when extended towards RGB-D indoor scene classification. 1) The semantic cues such as objects of the indoor scene have high spatial variabilities. The spatially rigid global representation from CNN is suboptimal. 2) The cluttered indoor scene has lots of redundant and noisy semantic cues; thus discerning discriminative information among them should not be ignored. 3) Directly concatenating or summing global RGB and Depth information as presented in popular methods cannot fully exploit the complementarity between two modalities for complicated indoor scenarios. To address the above problems, we propose a novel unified framework named Multi-modal Attentive Pooling Network (MAPNet) to address these problem. Two orderless attentive pooling blocks are constructed in MAPNet to aggregate semantic cues within and between modalities meanwhile maintain the spatial invariance. We further show that the proposed model is interpretable, which helps to understand mechanisms of both scene classification and multi-modal fusion in MAPNet. Extensive experiments and analysis on SUN RGB-D Dataset and NYU Depth Dataset V2 show the superiority of MAPNet over current state-of-the-art methods.

Publication

- 1 **Semantics-guided Multi-level RGB-D Feature Fusion for Indoor Semantic Segmentation**
Yabei Li, Junge Zhang, Yanhua Cheng, Kaiqi Huang, Tieniu Tan
in Proceedings of IEEE International Conference on Image Processing(ICIP), **oral** presentation, 2017
- 2 **DF²Net: A Discriminative Feature Learning and Fusion Network for RGB-D Indoor Scene Classification**
Yabei Li, Junge Zhang, Yanhua Cheng, Kaiqi Huang, Tieniu Tan
in Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence(AAAI), **oral** presentation, 2018
- 3 **MAPNet: Multi-modal attentive pooling network for RGB-D indoor scene classification.**
Yabei Li, Zhang Zhang, Yanhua Cheng, Liang Wang, Tieniu Tan
Pattern Recognition, 2019

Skills

- **English**
CET-4:607, CET-6:564, TOEFL: 97 (r:29,l:27,s:19,w:22), GRE: 324 (154+170) +3, good ability of listening, speaking, reading and writing papers in English
- **Computer Languages**
python, Matlab, C, C++, L^AT_EX
- **Operating Systems**
Windows, Linux, Apple OS X
- **Deep Learning Frameworks**
Tensorflow, Caffè, Pytorch

Social & Academic Activities

2016.5-present	Member of Women in IEEE
2015.9-2016.9	Member of Student Union in CASIA
2010.9-2012.6	Member of Student Union in HFUT

Honors

2016	Merit Student of Chinese Academy of Sciences(Top 5%)
2016	Outstanding Student Leader of Chinese Academy of Sciences
2014	Excellent Bachelor Thesis Award
2013	Finalist of the Mathematical Contest in Modeling(MCM)(Top 0.4%)
2013	First Class Scholarship, Merit Student of HFUT(Rank 4/281)
2012	Scholarship of P.R. China(Rank 1/281)
2011	Scholarship of P.R. China(Rank 1/135)