Zeng PENG

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Education

09/2015-Present

- Bachelor of Engineering in Software Engineering, College of Information Engineering, Northwest A&F University (985&211)
- GPA: 3.22/4.0, 82.62/100

Publications

Conference paper

- **Zeng Peng,** Cheng C. An effective segmentation algorithm of apple watercore disease region using fully convolutional neural networks. 2017 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC), Pages:1292–1299, IEEE Conferences, 2017.

Research Experience

04/2016-05/2017 Use Deep Learning to Detect Apple's Watercore Disease Region Main Researcher

This project is a cooperation of College of Life Science and College of Information Engineering, Northwest A&F University. The purpose is to use deep learning methods to detect and segment apple's watercore disease region. I mainly made the following contributions:

- Build an apple watercore disease image database and manually labeled disease regions (997.3 million positive pixel samples and 410.5 million background pixel samples).
- During the research, I read a lot of related paper, and then I implemented Fully Convolutional Neural Networks (FCN) under the Tensorflow platform of Ubuntu to solve this segmentation problem. Compared to Bayesian classifier, it shows that the deep layered architectures perform extremely well in representing high dimensional features, particularly in our dataset, and varied lighting conditions and bruise features are beautifully learnt and represented.
- Made an easy-use software called AWD (Apple Watercore Detection) for life science researchers to detect and segment watercore disease region in real-time.
- Published one research paper as first author.
- Follow-up work is using state-of-the-art methods to improve segmentation performance. an SCI paper is under reviewing.

12/2017-12/2017 Participate in the APSIPA ASC 2017 Academic Conference Invited participants

APSIPA ASC is an international summit in the area of signal and information processing initiated by the Asia Pacific Signal and Processing Society. I went to Kuala Lumpur, Malaysia in December 2017 to attend the meeting and made a poster report.

6/2018 – NOW Internship in Hikvision Research Institute Research Intern

During my internship in Hikvision Research Institute, I continue to study computer vision with deep learning, especially in solving segmentation problem, both in semantic and video filed:

- Using state-of-the art semantic segmentation algorithm Deeplab v3+ as base model, I tried to equip its original ability with attention mechanism, Squeeze-and-Excitation module, and fancy group normalization and trained on a huge virtual dataset captured from GTA V, all work will based on MXNet and Detectron, and later I will try to transfer my algorithm on real dataset from our institute, future work will be video segmentation and pose understanding and chasing for real-time. I am still working on this project.
- I am leading a human parsing project under a large-scale dataset from our company, which contains 150k fine labeled data with 9 categories. For practical uses, time consuming and memory efficiency must be taken into account, so I am trying Deeplab v3+ with MobileNet v2 as its backbone, and it's still undergoing.

Recently our group DEEP-HRI (Hikvision Research Institute) got first place in Moments in Time Challenge 2018 which is hosted at CVPR'18. (Moments in Time is a large-scale dataset for recognizing and understanding action in videos).

Professional Skills

- Overall IELTS band score (Academic) is 7.0 (L: 7.5, R:7.5, W:6.0, S:6.5).
- Familiar Programming language: Python, C++, C, Matlab.
- Familiar Deep Learning Framework: MXNet, Pytorch, Tensorflow, caffe2.
- Familiar Computer Vision Library：OpenCV.
- Good at using deep learning algorithms to solve problems of semantic segmentation, know advanced works of instance segmentation and video segmentation, have great passion for video understanding, know other classic algorithms for visual problems like classification, detection, recognition.

Research Interests

- Computer Vision
- Deep Learning
- Machine Learning
- Medical Image Understanding/Video Understanding