

Kai Chen

PHD CANDIDATE IN CUHK

SHB 703, The Chinese University of Hong Kong

✉ chenkaidev@gmail.com | 📱 hellock

Education

The Chinese University of Hong Kong

PH.D IN INFORMATION ENGINEERING

- Member of Multimedia Lab, supervised by Dahua Lin

Hong Kong

Aug. 2015 - PRESENT

Tsinghua University

B.S. IN AUTOMATION

- GPA 89.8/100.0, ranking 18/135

Beijing, China

Sept. 2011 - Jul. 2015

Experience

Facebook AI Research (FAIR)

RESEARCH INTERN

- Researched on object detection and video analysis.

Menlo Park, CA, U.S.

Feb. 2019 - May 2019

Sensetime

RESEARCH INTERN

- Researched on face detection algorithms.

Beijing, China

Jul. 2014 - Mar. 2015

Graduation project

UNDERGRADUATE STUDENT

- Designed a lane detection method using a monocular camera and applied it to the auto-balancing bicycle.

Beijing, China

Feb. 2015 - Jun. 2015

Honors & Awards

- 2018 Winner, COCO Object Detection Challenge
- 2017 Winner, The DAVIS Challenge on Video Object Segmentation
- 2015 National Virtual Instrument Contest, Grand Prize(top 1)
- 2014 Tsinghua Academic Merit Scholarship
- 2014 The 32nd "Challenge Cup" Undergraduate Curricular Academic Science and Technology Competition of Tsinghua University, 1st Prize
- 2014 HAGE Endeavor Scholarship, Department of Automation, Tsinghua University
- 2013 Tsinghua Academic Merit Scholarship
- 2012 National Physics Competition of College Students, 3rd Prize

Research Projects

- **Image object detection and instance segmentation.** We revisited the dense anchoring scheme of modern object detection pipelines. To overcome the shortage of uniform sliding window anchors with predefined scales and aspect ratios, we proposed the Guided Anchoring (GA) scheme, which predicts sparse and arbitrary shaped anchors. It achieves 9.1% higher recall than RPN and improve detection mAP of various methods by 1.2% to 2.7%. We introduce the cascade architecture to instance segmentation, and proposed Hybrid Task Cascade (HTC), which leverages the reciprocal relationship between detection and segmentation. We also explored the spatial context as a strong complement to box and mask branches. With these two methods, we won the 1st place in COCO 2018 Instance Segmentation Challenge. We also released a high quality object detection codebase based on PyTorch named **mmdetection** (> 2.5k stars and 600 forks).

- **Video object detection.** We aimed to seek a better balance between computational cost and performance. The basic idea is to perform expensive detection sparsely and propagate the results across both scales and time with substantially cheaper networks, by exploiting the strong correlations among them. Specifically, we presented a unified framework that integrates detection, temporal propagation, and across-scale refinement on a *Scale-Time Lattice*. It achieved a competitive mAP **79.6%** at 20 fps, or **79.0%** at 62 fps as a performance/speed tradeoff on ImageNet VID dataset.
- **Weakly supervised object discovery and detection.** We explored a new task that automatically discovers and learns new object categories from documentary videos and corresponding subtitles. Towards this goal, we developed a joint probabilistic framework, where individual pieces of information, including video frames and subtitles, were brought together via both visual and linguistic links. On top of this formulation, we further derived a weakly supervised learning algorithm, where object model learning and training set mining are unified in an optimization procedure.

Publication

- **Kai Chen**, Jiangmiao Pang, Jiaqi Wang, Yu Xiong, Xiaoxiao Li, Shuyang Sun, Wansen Feng, Ziwei Liu, Jianping Shi, Wanli Ouyang, Chen Change Loy, Dahua Lin. “Hybrid Task Cascade for Instance Segmentation”. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019 (**COCO 2018 Winning Entry**)
- Jiangmiao Pang, **Kai Chen**, Jianping Shi, Huajun Feng, Wanli Ouyang, Dahua Lin. “Libra R-CNN: Towards Balanced Learning for Object Detection”. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
- Jiaqi Wang*, **Kai Chen***, Shuo Yang, Chen Change Loy, Dahua Lin. “Region Proposal by Guided Anchoring”. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
- **Kai Chen**, Jiaqi Wang, Shuo Yang, Xingcheng Zhang, Yuanjun Xiong, Chen Change Loy, Dahua Lin. “Optimizing Video Object Detection via a Scale-Time Lattice”. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018
- **Kai Chen**, Hang Song, Chen Change Loy, Dahua Lin. “Discover and Learn New Objects from Documentaries”. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017 (**Spotlight**)
- Xiaoxiao Li, Yuankai Qi, Zhe Wang, **Kai Chen**, Ziwei Liu, Jianping Shi, Ping Luo, Xiaoou Tang, Chen Change Loy. “Video Object Segmentation with Re-identification”. Workshop of DAVIS Challenge on Video Object Segmentation, CVPR 2017 (**Winning Entry**)

Reviews

- International Conference on Computer Vision (ICCV) 2019
- Conference on Computer Vision and Pattern Recognition (CVPR) 2019
- European Conference on Computer Vision (ECCV) 2018
- ACM Multimedia Conference (ACMMM) 2018
- The British Machine Vision Conference (BMVC) 2018, 2019
- International Journal of Computer Vision (IJCV)

Skills

- Programming** Python, C/C++, Matlab
- Web** Flask with Python, HTML, Javascript, PHP