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Horizon Robotics

CASIA

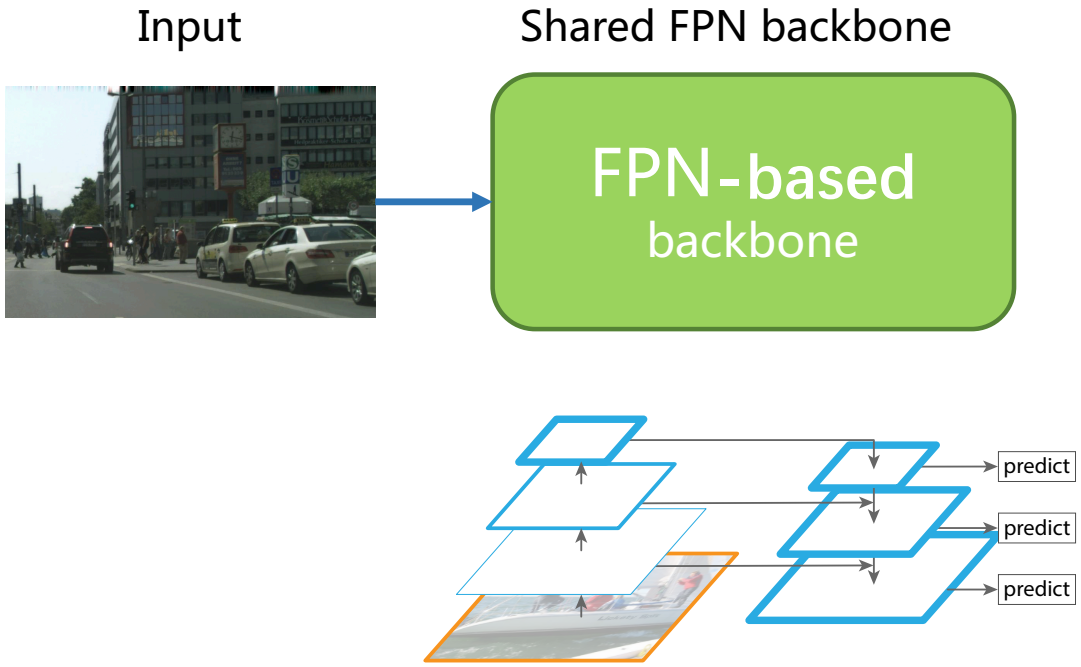
FPN-based Network for Panoptic Segmentation

Caribbean Team

Yanwei Li* [1, 2], Naiyu Gao* [1, 2], Chaoxu Guo [1, 2], Xinze Chen[1], Qian Zhang[1],
Guan Huang[1], Xin Zhao[2], Kaiqi Huang[2], Dalong Du[1], Chang Huang[1]

[1] Horizon Robotics,
[2] Institute of Automation, CAS

FPN-based Network



Kirillov A, He K, Girshick R B, et al. Panoptic Segmentation.[J]. arXiv: Computer Vision and Pattern Recognition, 2018.
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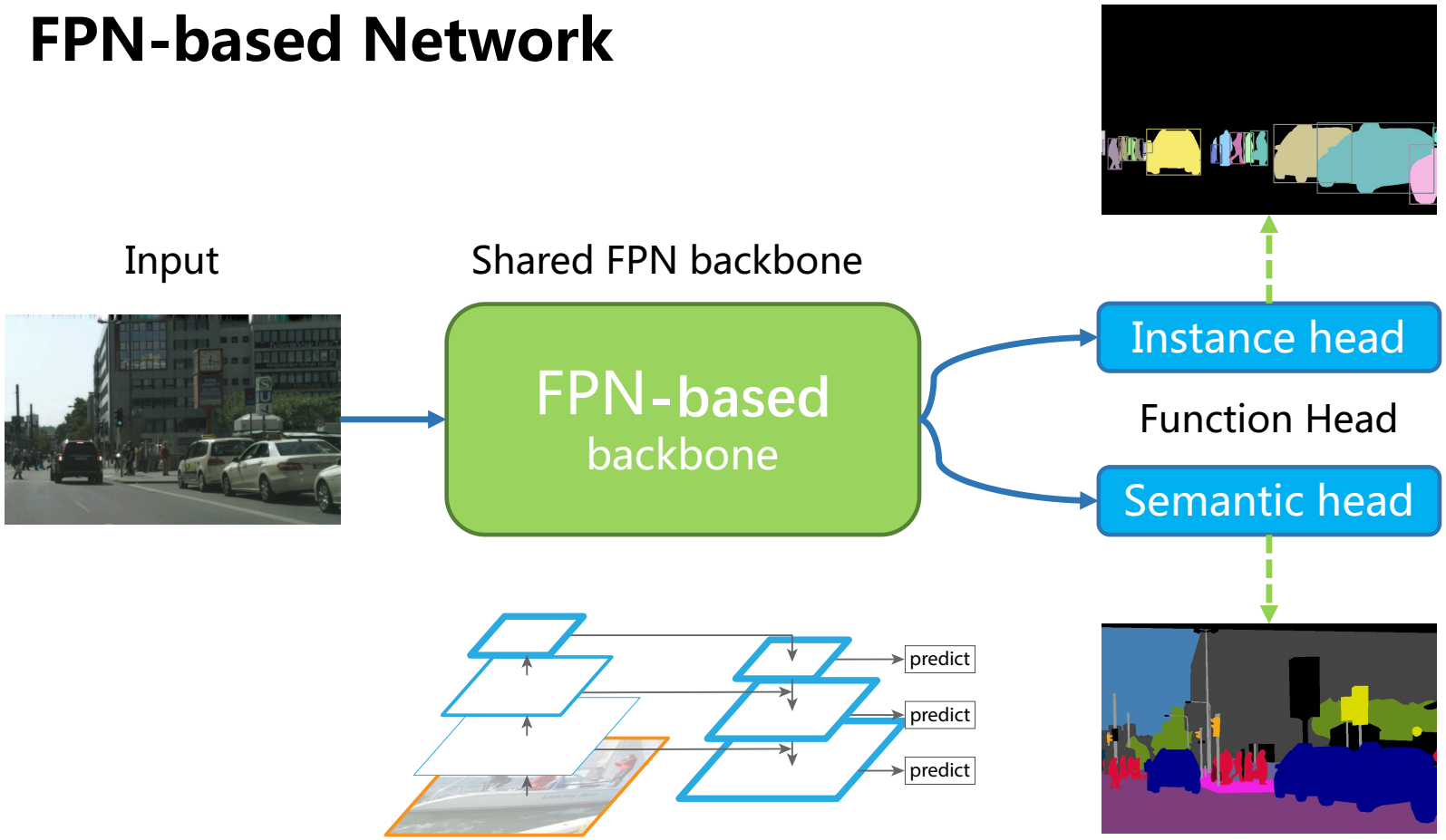

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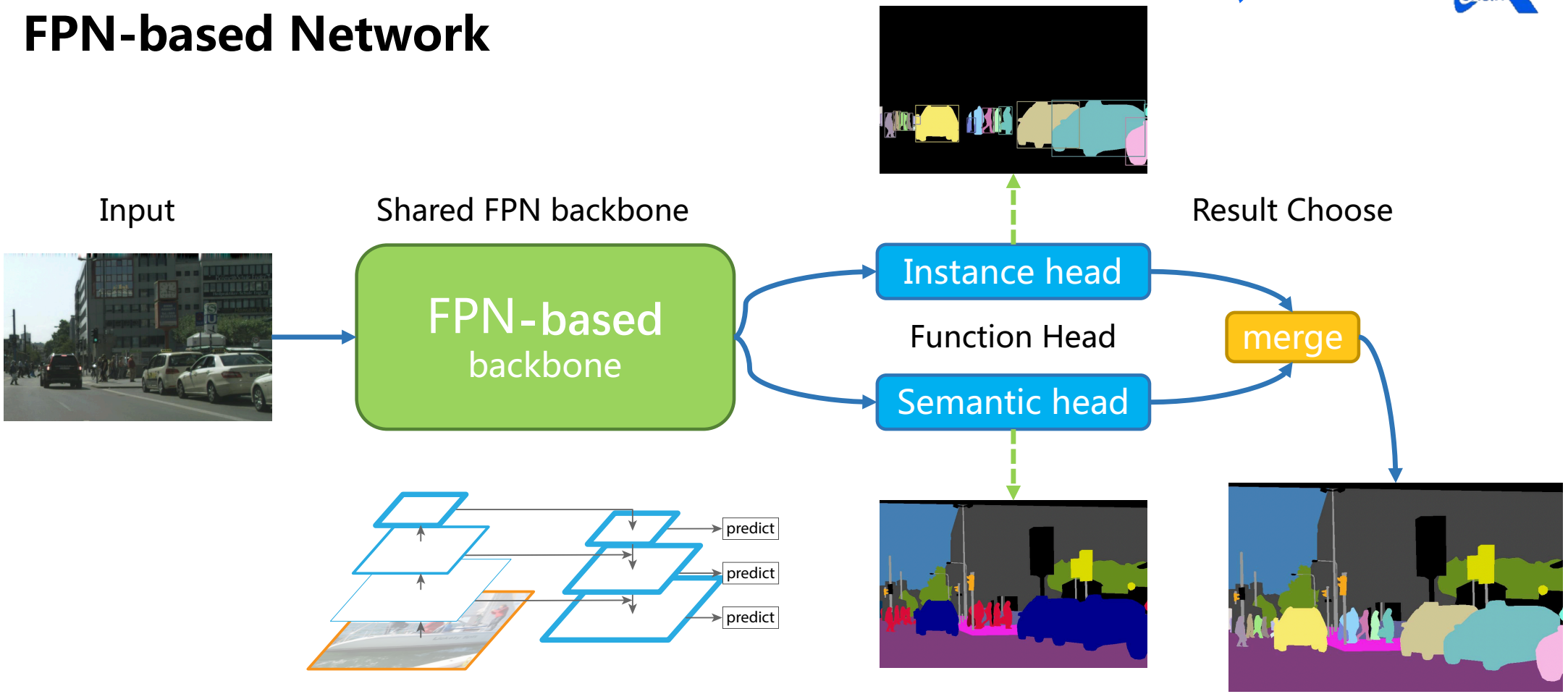

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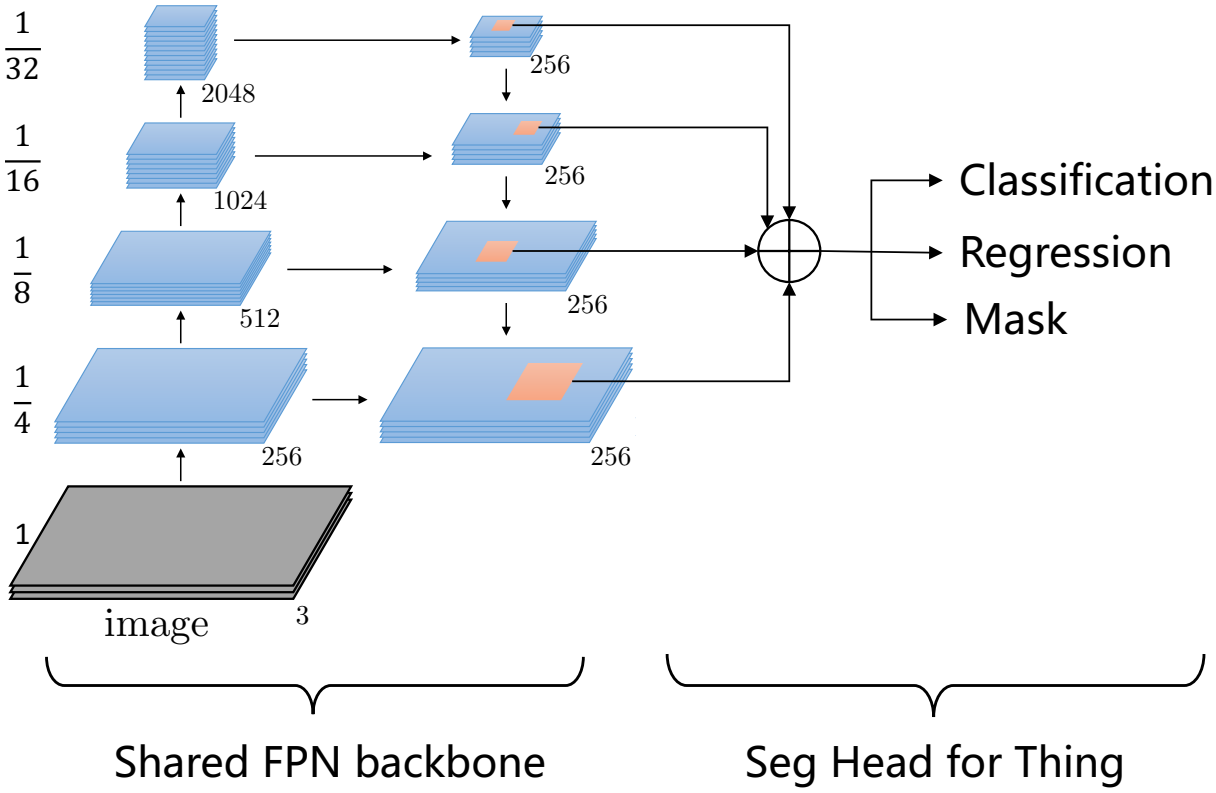
Panoptic Segmentation (Thing)

Unified Framework

- Mask R-CNN architecture
- Shared FPN backbone



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Cai Z, Vasconcelos N. Cascade R-CNN: Delving Into High Quality Object Detection[J]. CVPR 2018.

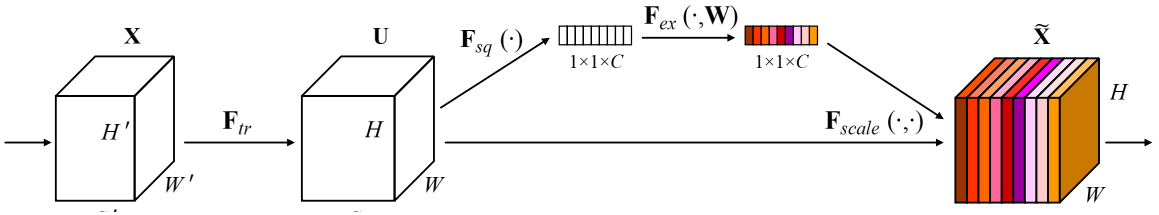
Panoptic Segmentation (Thing)

Unified Framework

- Mask R-CNN architecture
- Shared FPN backbone

Stronger Network

- SENet154
- Deformable Conv.
- Nonlocal Conv.



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Panoptic Segmentation (Thing)

Unified Framework

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- Shared FPN backbone

Stronger Network

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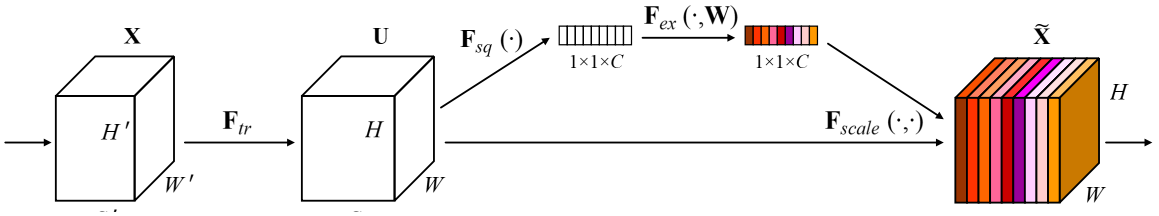
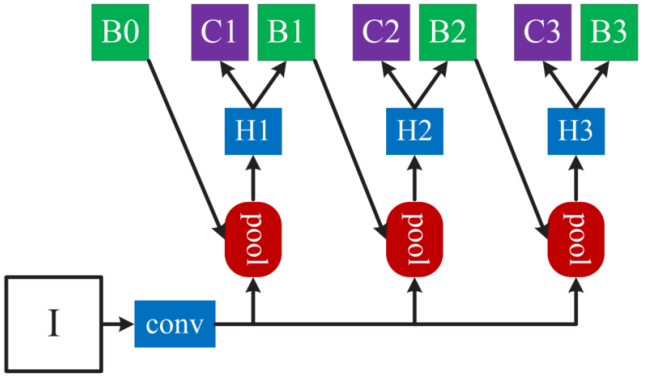
- Deformable Conv.
- Nonlocal Conv.

Bbox Head

- Cascade R-CNN





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Panoptic Segmentation (Thing)

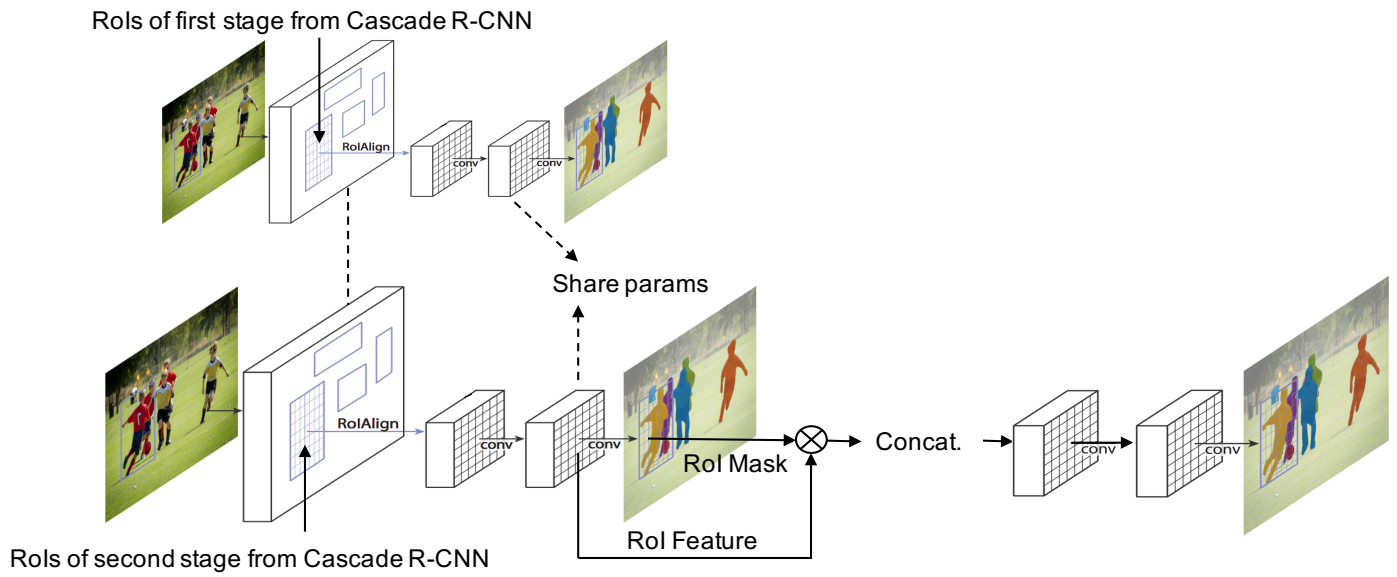
Unified Framework
- Mask R-CNN architecture
- Shared FPN backbone

Stronger Network
- SENet154
- Deformable Conv.
- Nonlocal Conv.

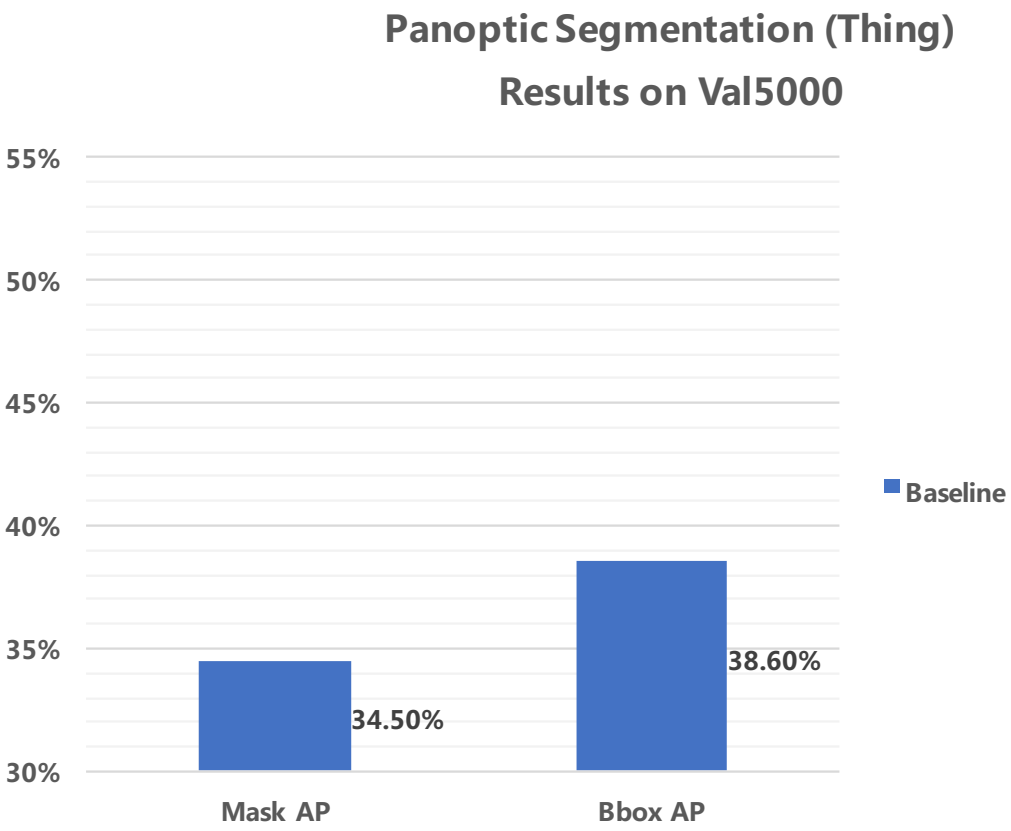
Bbox Head
- Cascade R-CNN

Mask Head
- Cascade Mask
  Exploits RoIs of from box head
  to refine the mask results.

Test-tricks

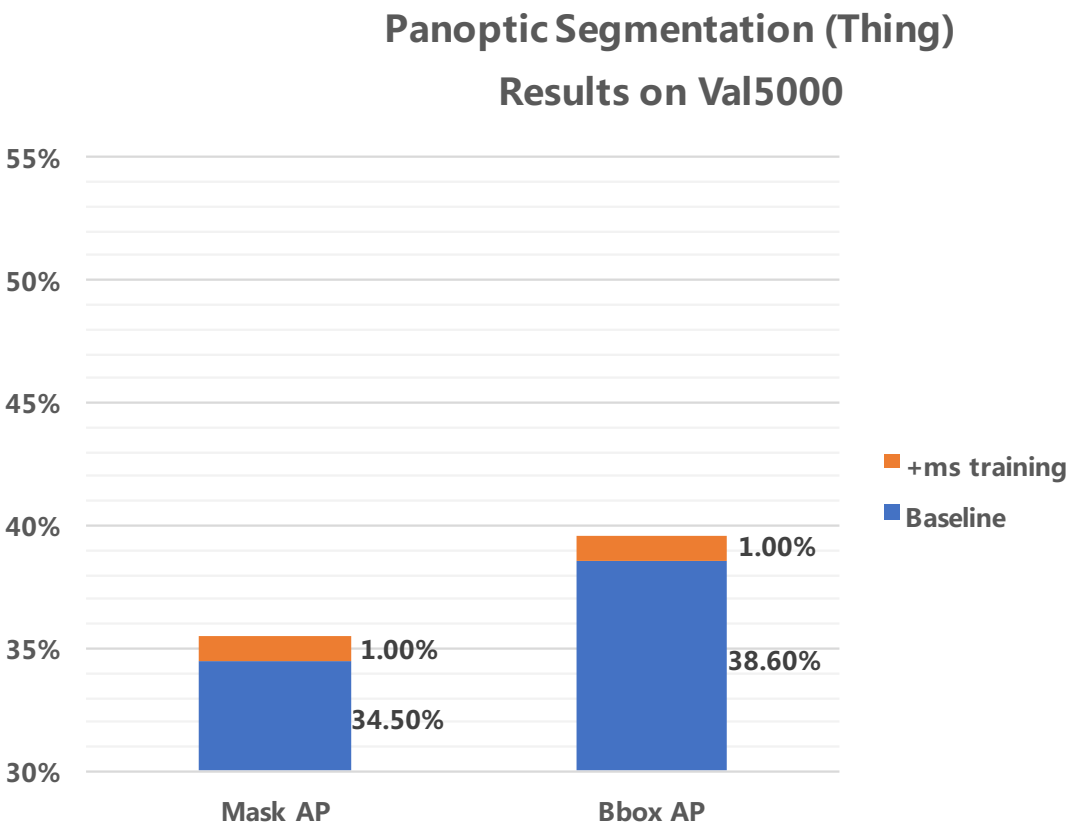


Shared FPN Inference Thing



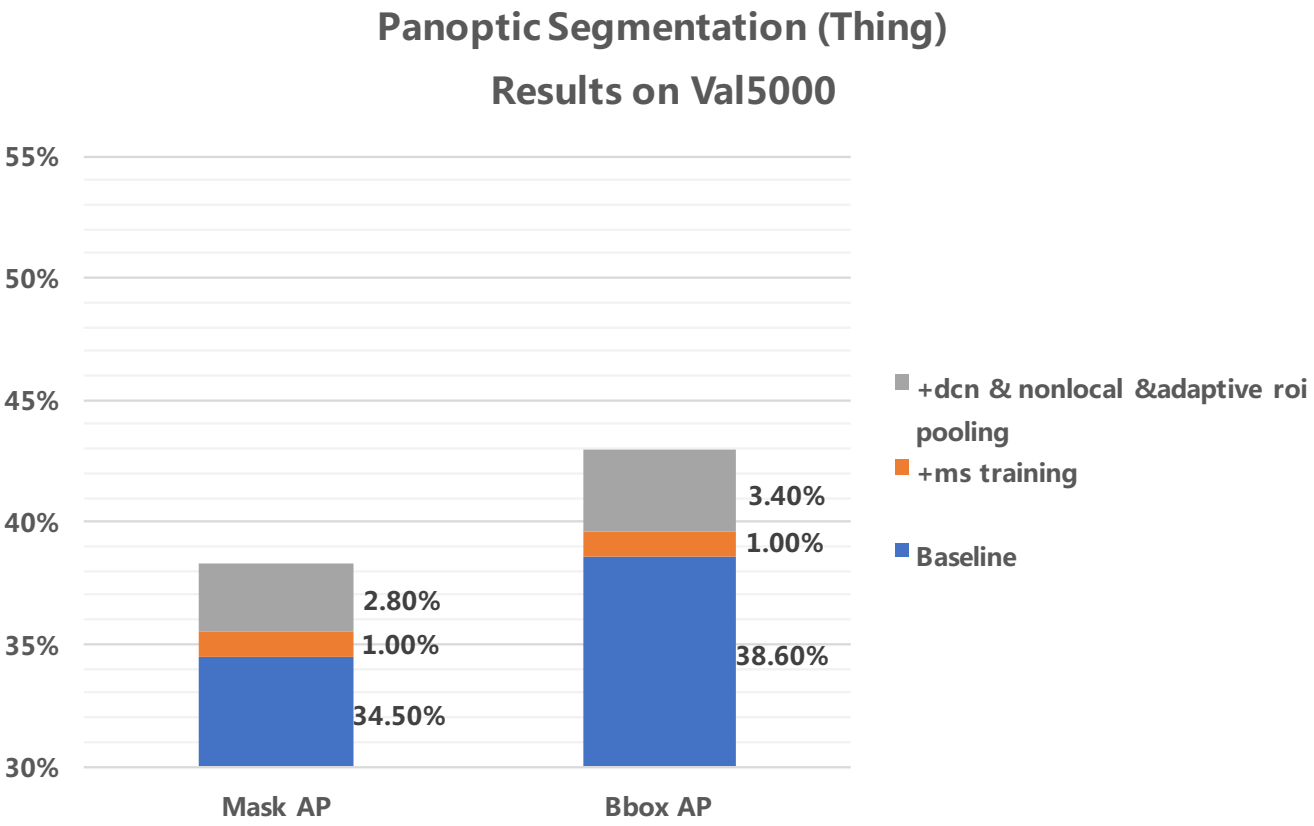
- ResNet50 baseline

Shared FPN Inference Thing



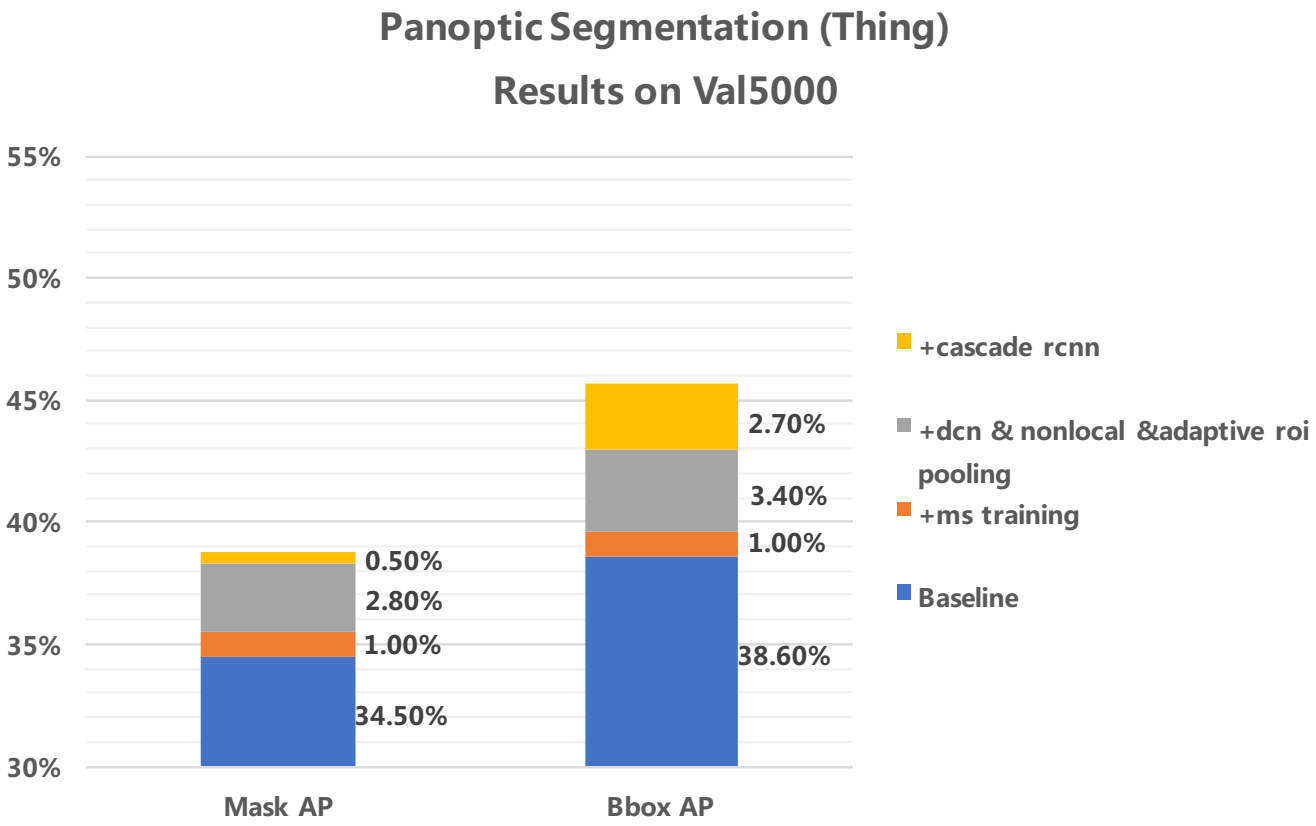
- ResNet50 baseline
- Using multi-scale training

Shared FPN Inference Thing



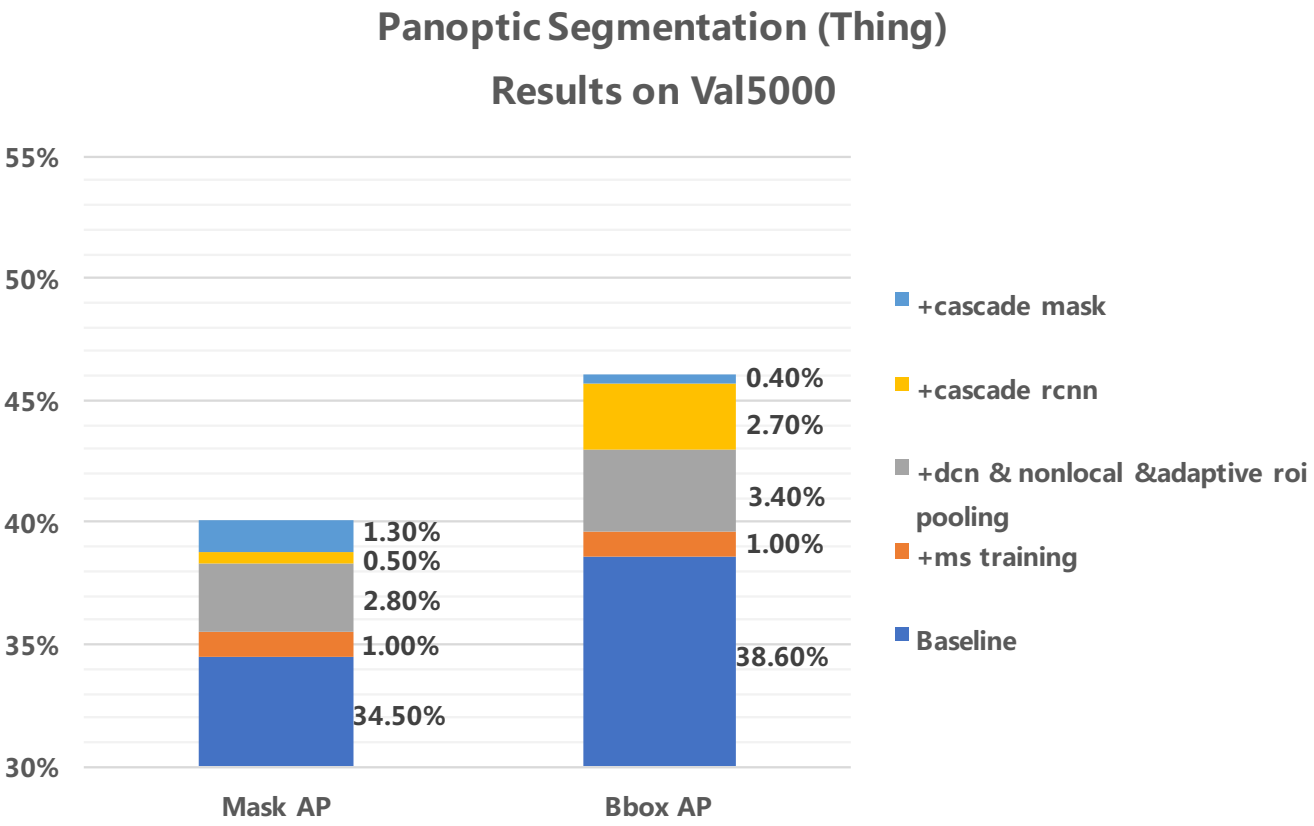
- ResNet50 baseline
- Using multi-scale training
- Adopt DCN & Nonlocal & Adaptive RoI pooling

Shared FPN Inference Thing



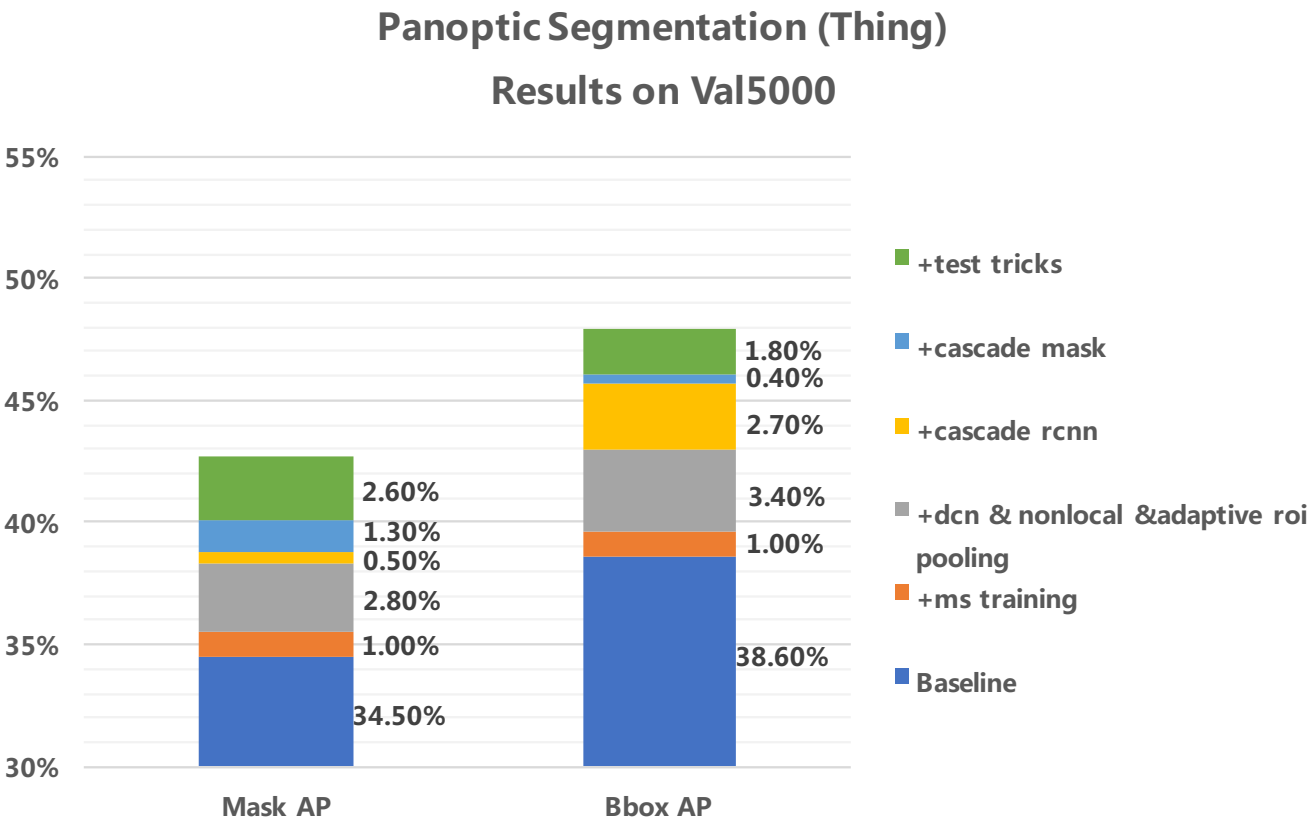
- ResNet50 baseline
- Using multi-scale training
- Adopt DCN & Nonlocal & Adaptive RoI pooling
- Cascade RCNN

Shared FPN Inference Thing



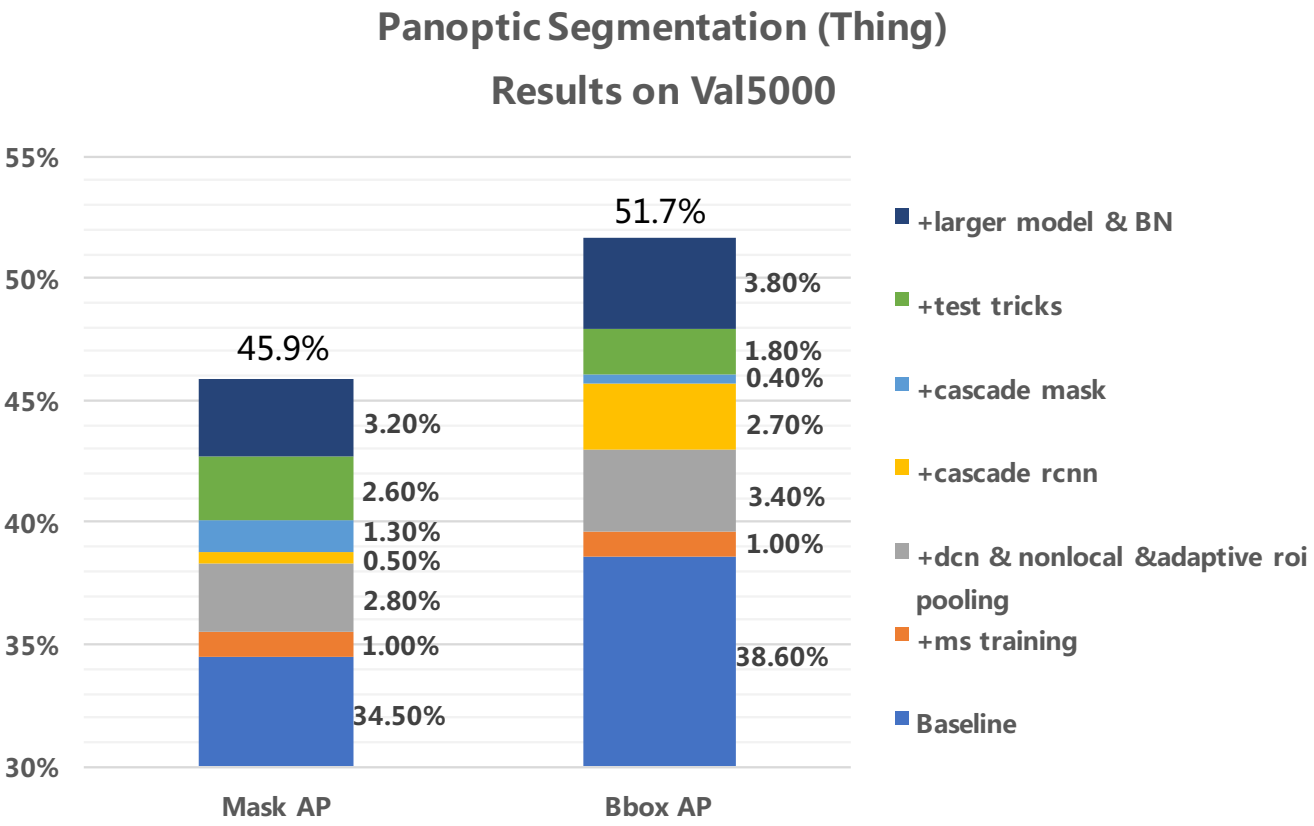
- ResNet50 baseline
- Using multi-scale training
- Adopt DCN & Nonlocal & Adaptive RoI pooling
- Cascade RCNN
- Cascade Mask

Shared FPN Inference Thing



- ResNet50 baseline
- Using multi-scale training
- Adopt DCN & Nonlocal & Adaptive RoI pooling
- Cascade RCNN
- Cascade Mask
- Using test tricks

Shared FPN Inference Thing



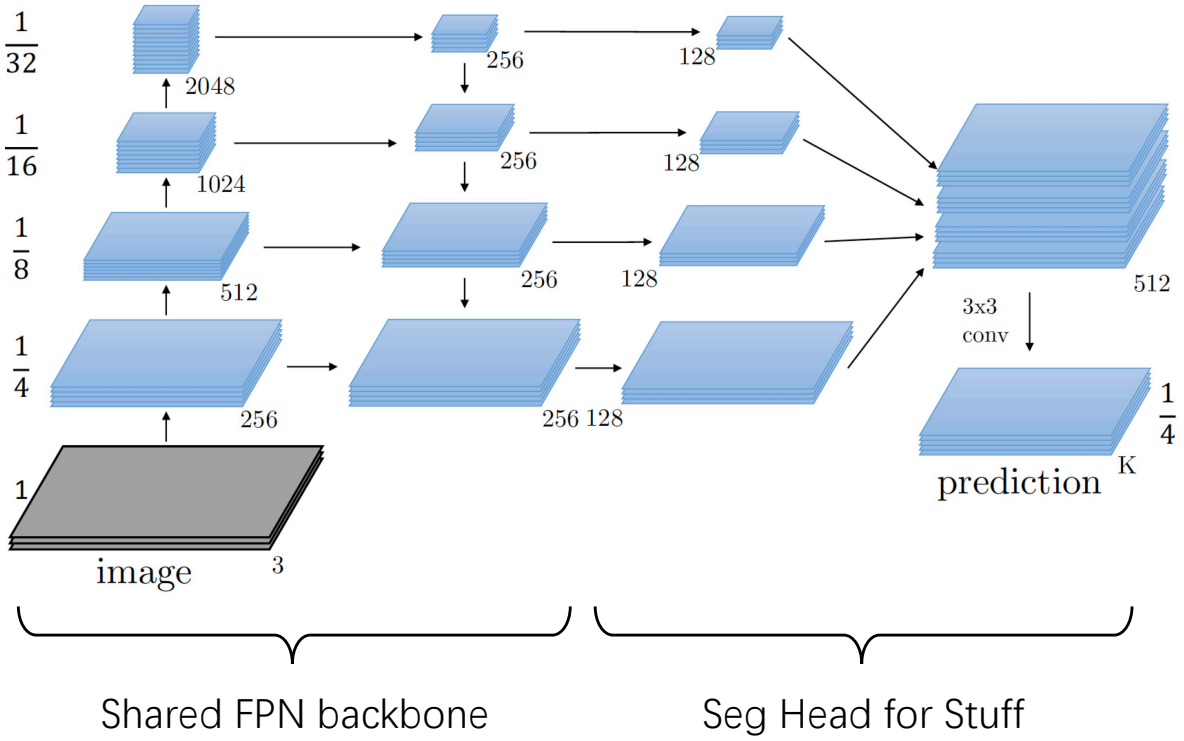
- ResNet50 baseline
- Using multi-scale training
- Adopt DCN & Nonlocal & Adaptive RoI pooling
- Cascade RCNN
- Cascade Mask
- Using test tricks
- Using larger model & BN

Panoptic Segmentation (Stuff)

Unified Framework
- FCN-based architecture
- Shared FPN backbone

Stronger Network
- SENet154
- Deformable Conv.
- Nonlocal Conv.

Test-tricks
- Flip
- Multi-Scale testing
- Other tricks



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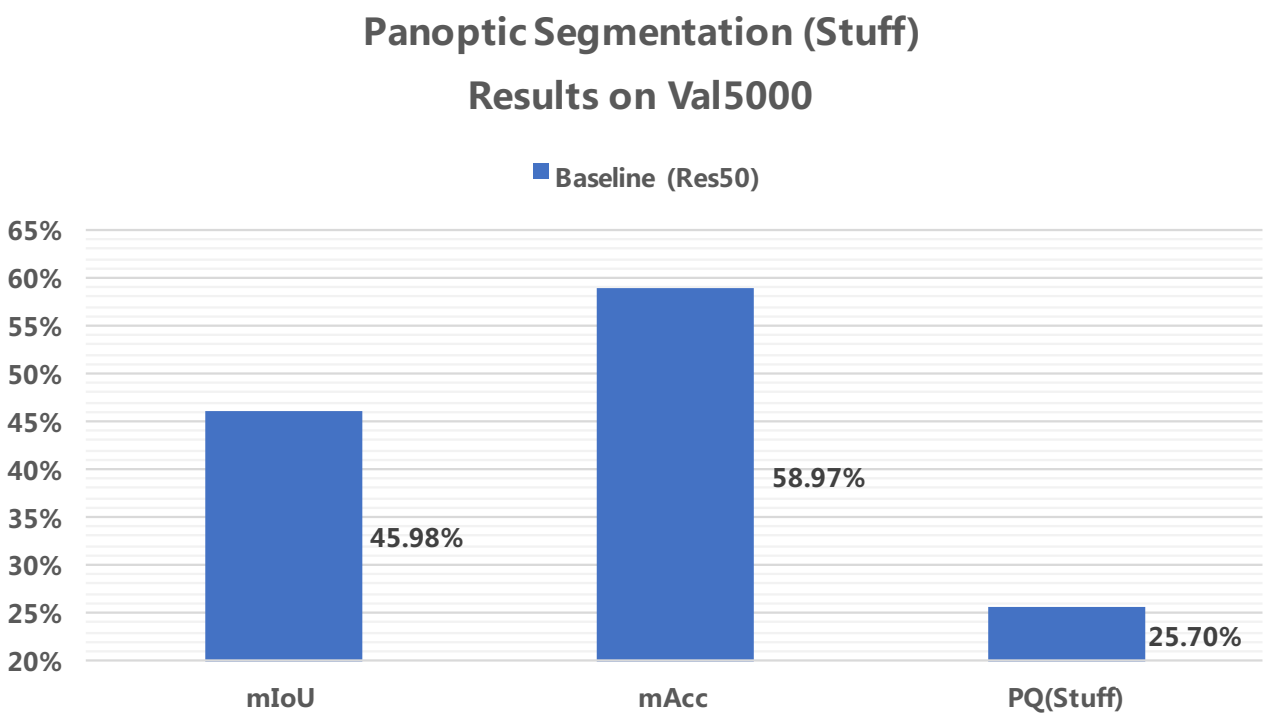
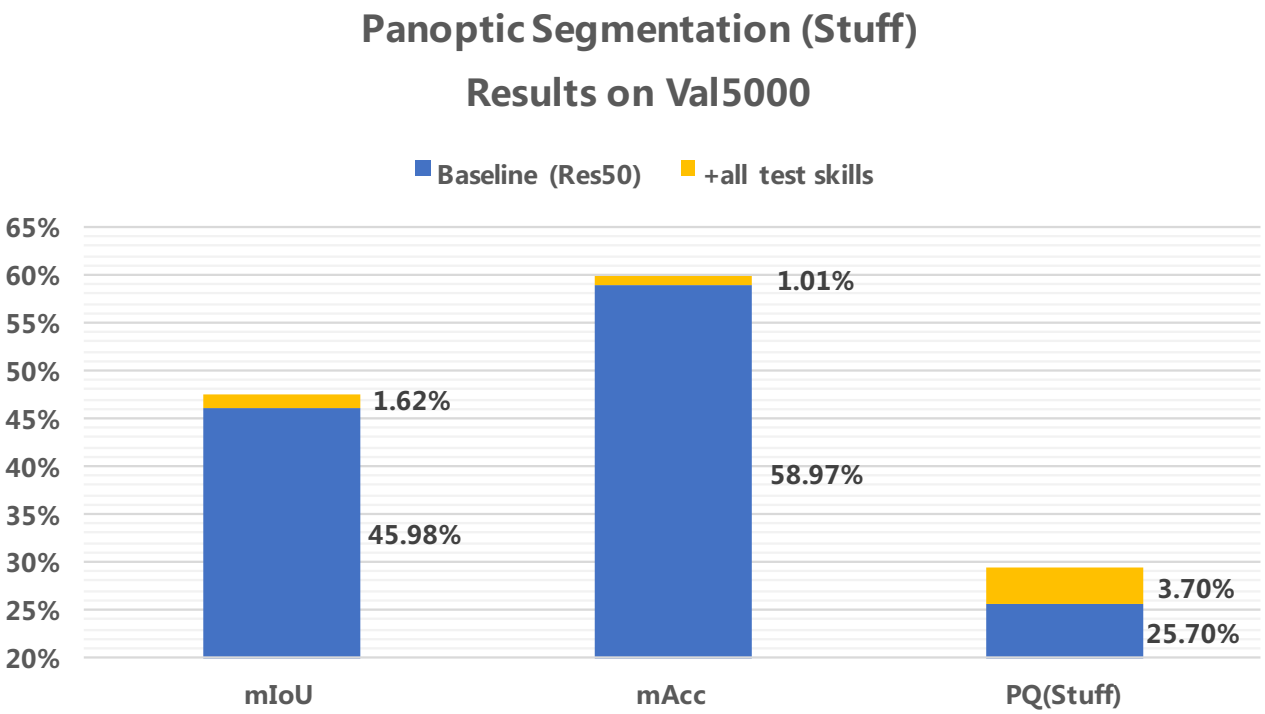
Shared FPN Inference Stuff



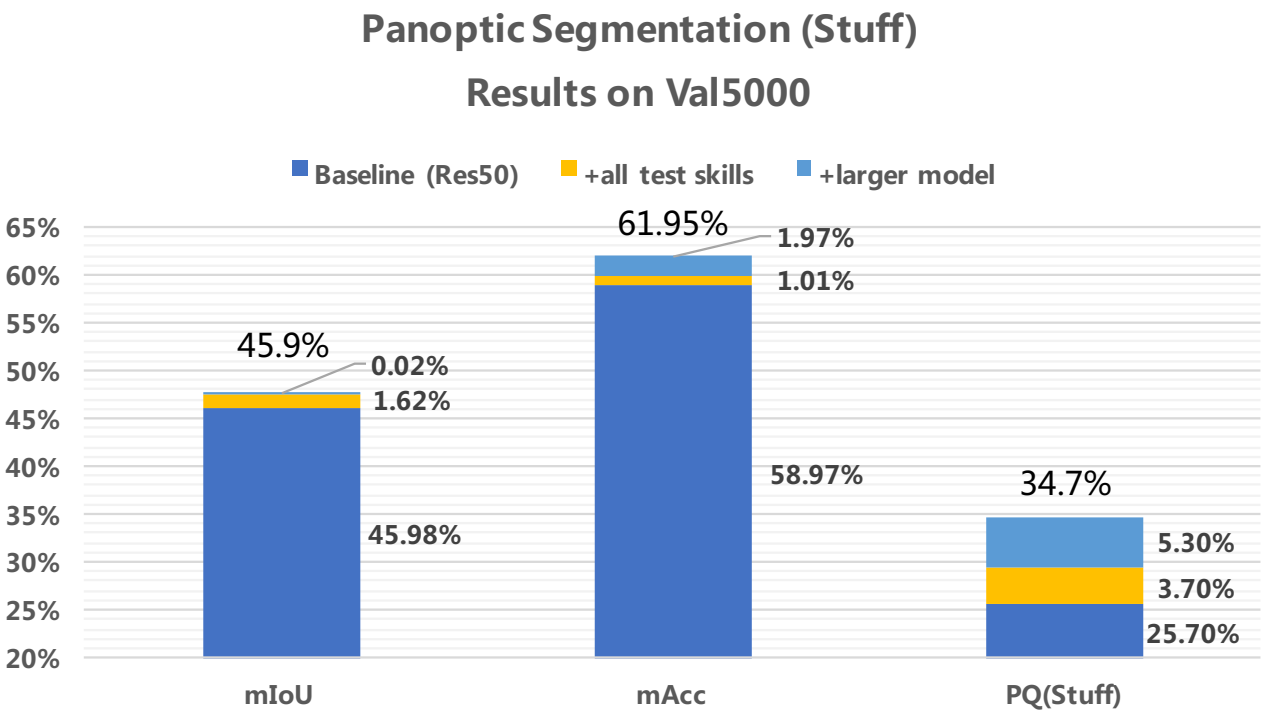
- ResNet50 baseline

Shared FPN Inference Stuff



- ResNet50 baseline
- Using all test skills

Shared FPN Inference Stuff

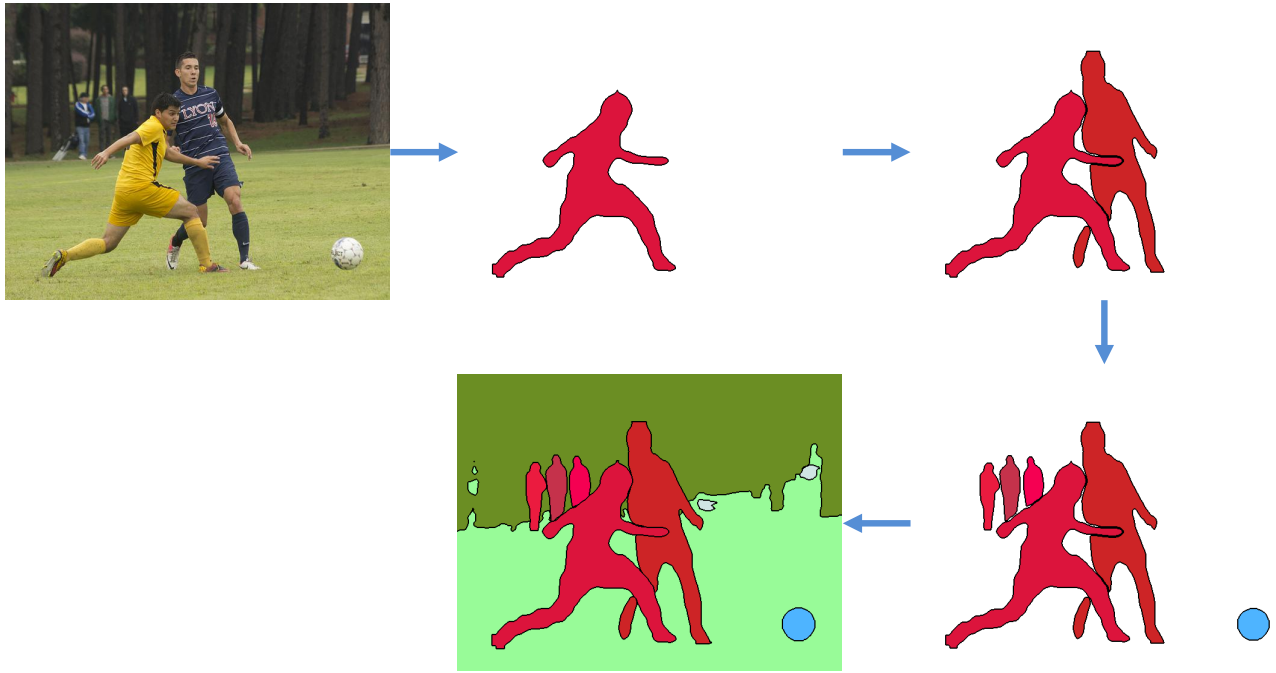


- ResNet50 baseline
- Using all test skills
- Adopt larger model

Panoptic Segmentation Merge

Merge method

- Sort thing results with scores
- Thing first, stuff second
- Merge tricks



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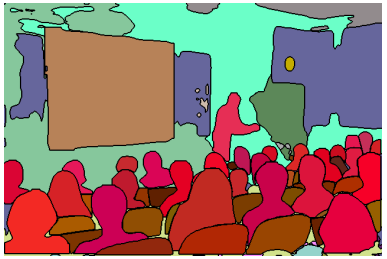
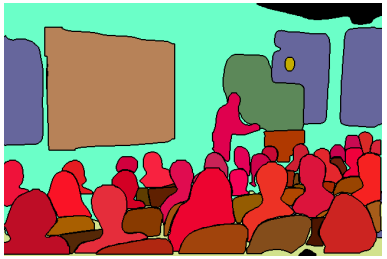
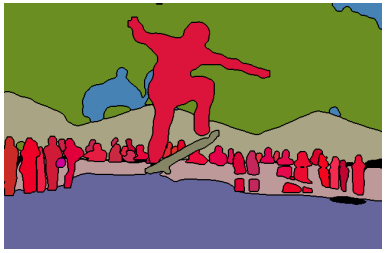
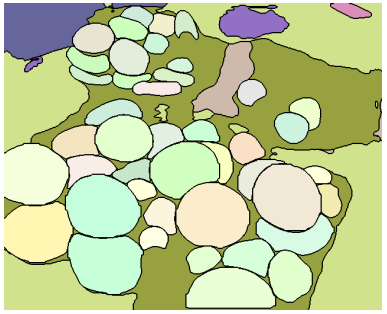
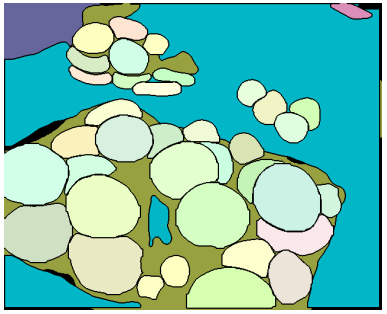
Visualize Results

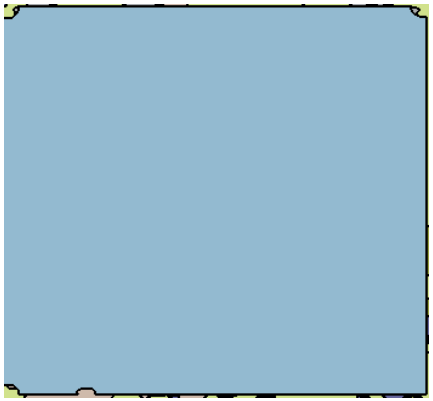
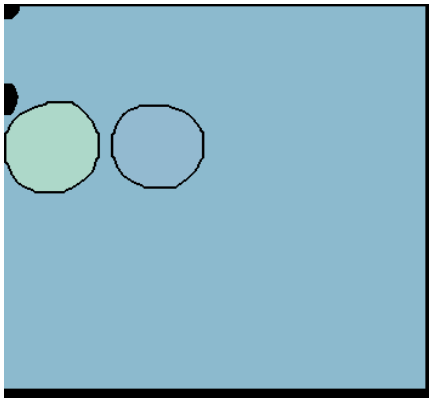




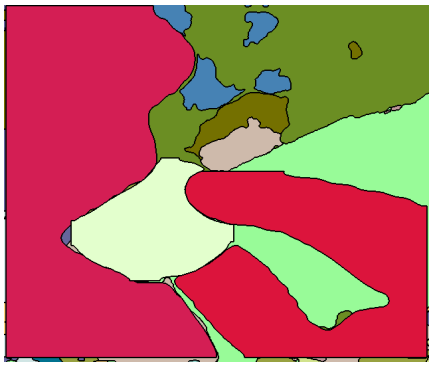



Input Baseline Ensemble

Failure Results

Input Baseline Ensemble

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Thanks & questions

For more questions, please contact:
liyanwei2017@ia.ac.cn