FAPIS: A Few-shot Anchor-free Part-based Instance Segmenter
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Problem Statement
• Training: Sufficiently many images with ground-truth segmentation of base classes.
• Testing: Few support images with ground-truth segmentation of a target class, and a query image. The training and test sets do not share the same object classes.
• Goal: Segment the target class in a query image.

A Typical Approach

Motivation
The box head of Mask-RCNN is anchor-based ➔ overfitting to particular sizes and aspect ratios of training classes.
The mask head of Mask-RCNN learns feature prototypes capturing global outlines of objects ➔ overfitting to the shapes of training classes.

Contribution 1: Anchor-free object detector
Contribution 2: Part-based instance segmenter

Table 1. Performance with different numbers of parts on COCO-20k

Table 2. mAP50 with std of one and five-shot instance segmentation on COCO-20k

Visualization of Learned Latent Parts

Qualitative Results

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