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VisDA Detection Challenge: Honorable Mention Talk

Siqi Yang, Arnold Wiliem and Brian C. Lovell
The University of Queensland, Australia

Task: Domain Adaptation for Object Detection

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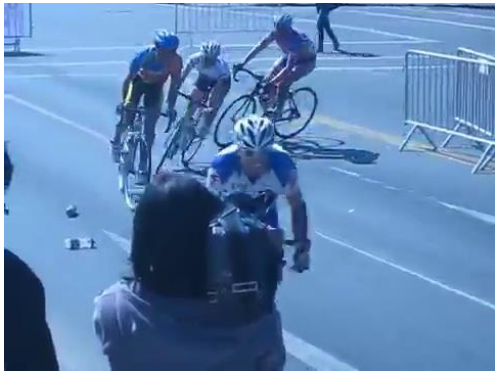
Real data (Validation)

Synthetic data (Train)

Adaptation

Real data (Test)



Motivation

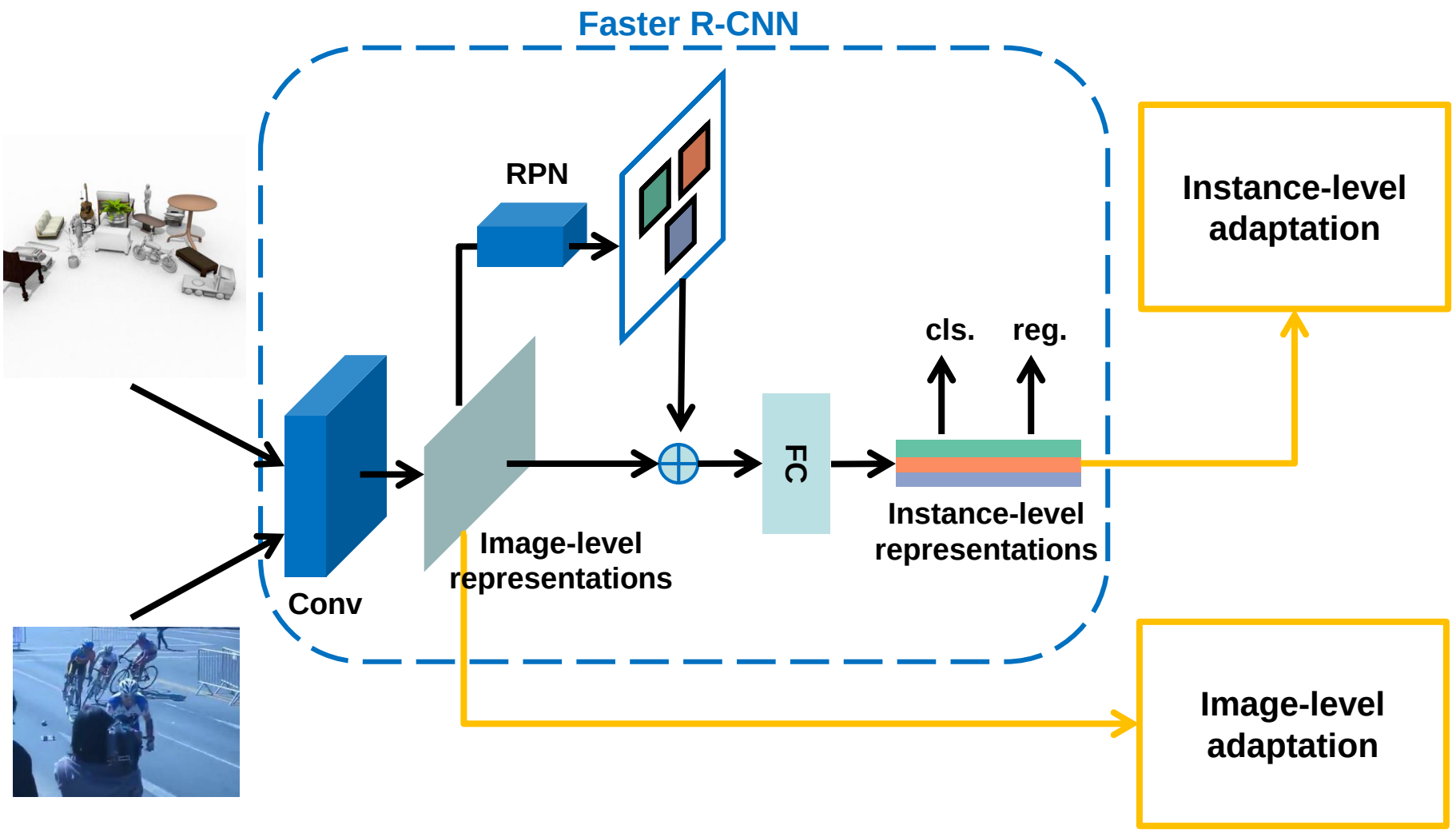
- Domain shift

Image-level domain shift:
Image scale, image style, context information for objects, etc.

Instance-level domain shift:
Object appearance, size, etc.

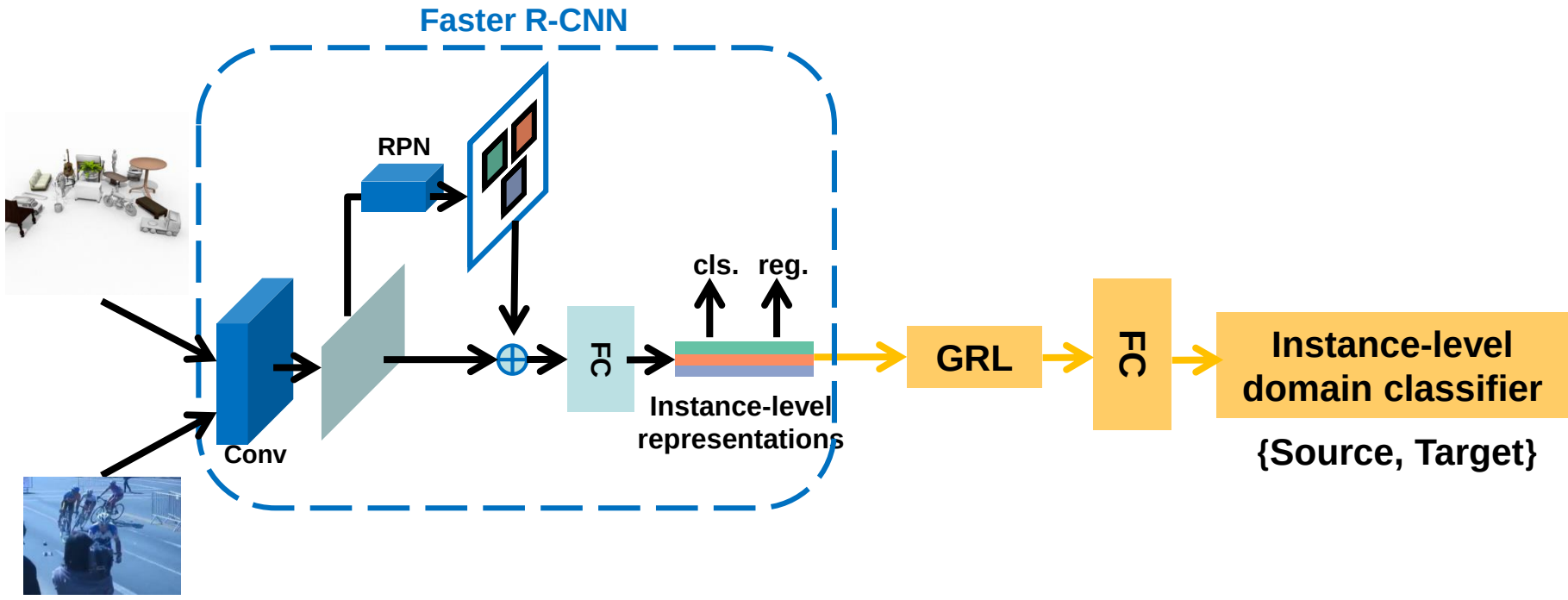
To minimize the domain discrepancy on both levels

Network Overview



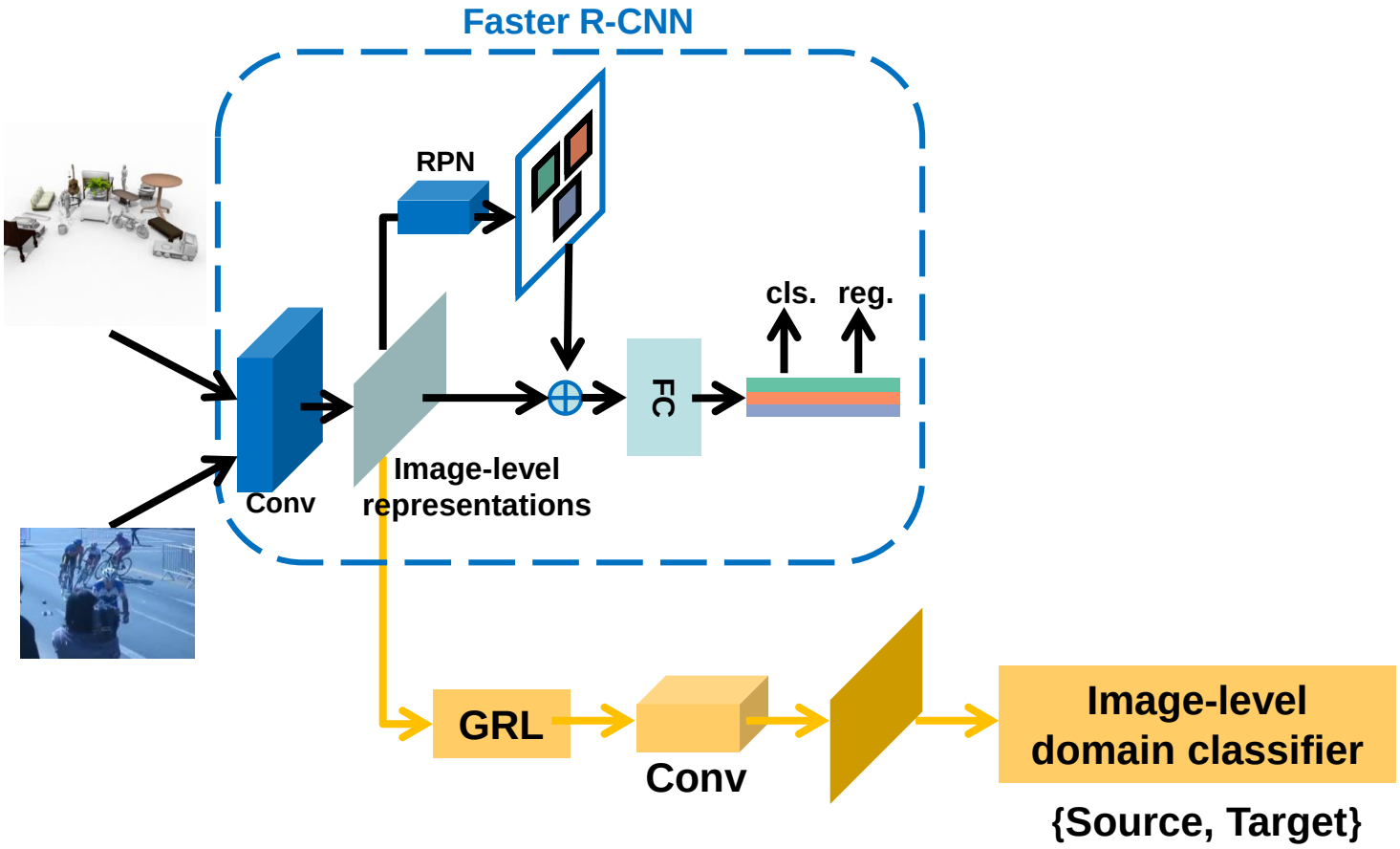
Chen, Yuhua, Wen Li, Christos Sakaridis, Dengxin Dai, and Luc Van Gool. "Domain adaptive faster r-cnn for object detection in the wild." In CVPR 2018.

Feature Level Domain Adaptation



GRL: Gradient Reverse Layer

Image Level Domain Adaptation



Implementation Details

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- ImageNet pre-trained VGG-16
- Our baseline model:
  - Caffe version of Faster R-CNN
- Training:
  - Training data: source training set + target test set
  - Single-scale training: [600]
  - Loss function: $L = L_{det} + \lambda(L_{img} + L_{ins})$, where $\lambda = 0.1$
- Testing:
  - Image pyramid inference: [150, 300]
  - Ensemble of source-only model and adapted model

Evaluation on Test Set

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Model	aero-plane	bi-cycle	bus	car	horse	knife	motor-cycle	per-son	plant	skate-board	train	truck	mAP
Source	3.1	17.2	15.5	29.6	17.5	0.7	22.2	3.3	14.0	5.6	2.1	2.4	11.1
Adapt	3.2	17.2	15,5	29.6	17.5	0.7	22.2	3.8	14.0	9.4	9.9	2.4	12.1

Thank you.