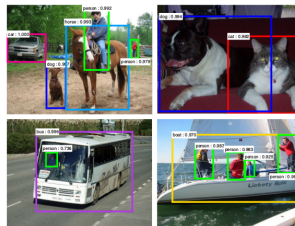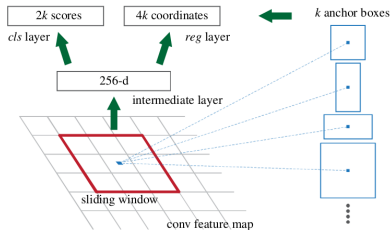# Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks

S. Ren, K. He, R. Girshick, and J. Sun (NIPS 2015)

- ▶ Region Proposal Network (RPN) for object detection
- ▶ Simultaneous prediction of object bounds and objectness scores at each position
- ▶ Region proposals are the computational bottleneck for state-of-the-art detectors.
- ▶ End-to-end training to generate region proposals for Fast R-CNN
- ▶ Nearly cost-free region proposals
- ▶ RPNs: a kind of fully-convolutional network (FCN)
- ▶ Alternating optimization to train RPN and Fast R-CNN with shared features
- ▶ 5 fps (including all steps) on a GPU
- ▶ State-of-the-art object detection accuracy on PASCAL VOC 2007