

DeepPrimitive: Image Decomposition by Layered Primitive Detection

Electronic Supplementary Material

S1. Definition of Primitive Parameters

For parallelogram and triangle there are 4 parameters involved; for spline curve, $2n$ parameters are defined where n is the number of control points. See Figure 1 for illustration.

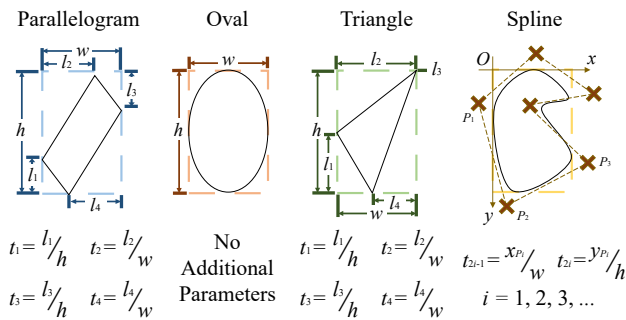


Figure 1. Definition of the regressed parameters of the four primitives used in our dataset. t_i denotes the parameters; w and h denote the width and height of the bounding box, respectively

S2. Configuration of Detection Block

The network configuration of the detection blocks d_i ($i = 1, 2, 3$) described in main paper is shown in Table 1. Note the detection blocks do not share weights among different levels.

Type	Channel	Filter size
Conv	$512 \rightarrow 1024$	3×3
Conv	$1024 \rightarrow 512$	1×1
Conv	$512 \rightarrow 1024$	3×3
Conv	$1024 \rightarrow 512$	1×1
Conv	$512 \rightarrow 1024$	3×3
Conv	$1024 \rightarrow C_{out}$	1×1

Table 1. The Detection Block d_i used in our network. Final output channels $C_{out} = B \times (5 + K + M)$. Meaning of the letters are explained in main paper

S3. Test Result on Material Icon Dataset

This section provides an illustration of the test results on our synthesized dataset (first 2 rows) as well as optimized result (other rows) on Google Material Icon [2]

dataset using our proposed model. The left picture in each column shows the original input image and the detection result while the right picture in each column reconstructs the input image with the detection result.

S4. Test Result on Real World Images

This section provides random selected test results of the real world image dataset consisting of pictures from PASCAL VOC2012 challenge [1] and the Internet.

References

- [1] M. Everingham, L. Van Gool, C. K. I. Williams, J. Winn, and A. Zisserman. The PASCAL Visual Object Classes Challenge 2012 (VOC2012) Results. <http://www.pascal-network.org/challenges/VOC/voc2012/workshop/index.html>. 1
- [2] I. Google. Google material icon. <https://material.io/icons/>. Accessed: 2017-08-01. 1



Figure 2. Test result on Material Icon dataset.

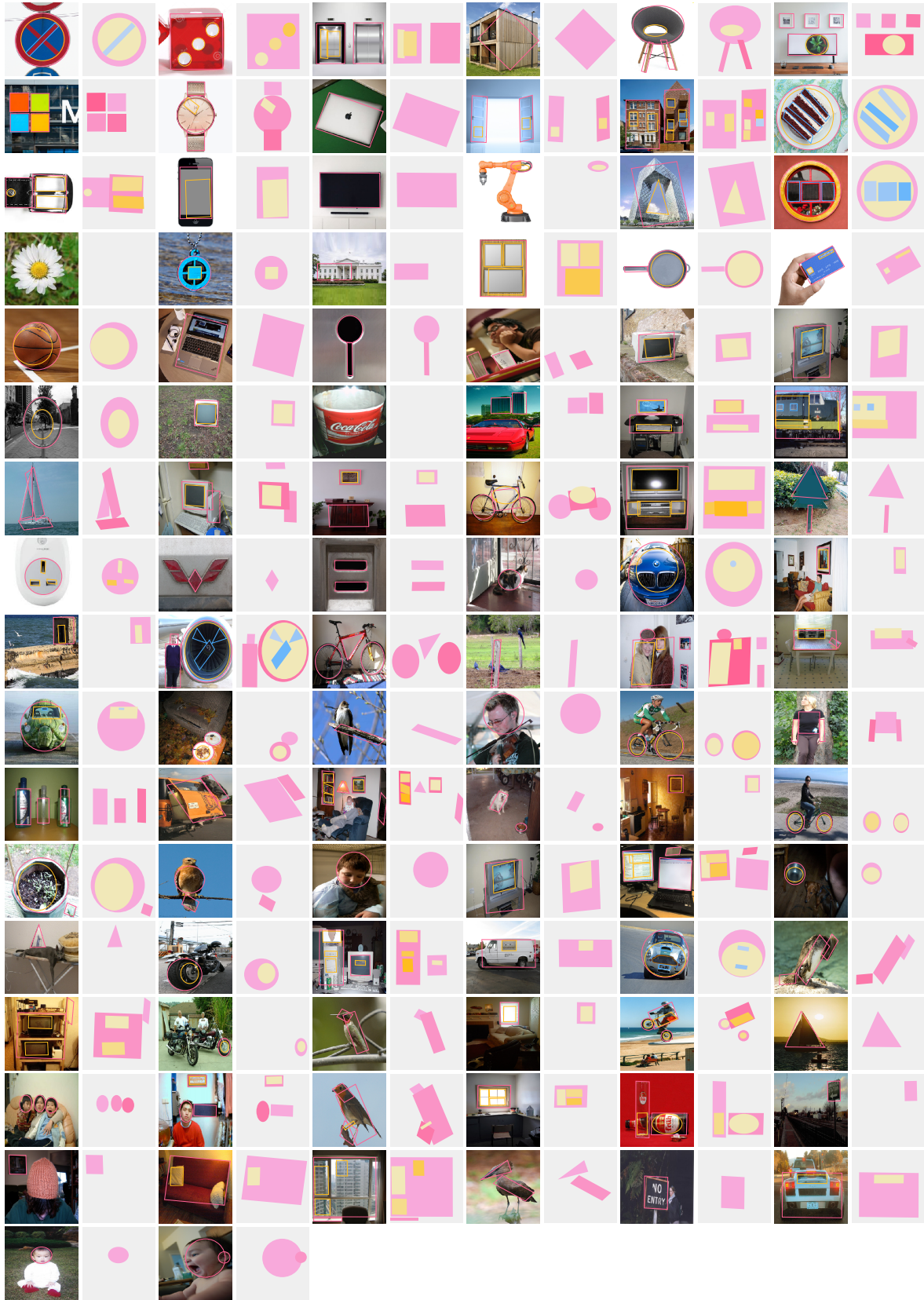


Figure 3. Test result on real world images.