Learning Compositional Models for Object Categories From Sample Sets

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Introduction

• Modeling object categories is a challenging task

- It is a structure based model
- Combines SCFG with Markov random field(MRF)
- similar to theory- "recognition-by- components"

Representation

• And–Or Graph



Representation

Relationships

Position	Scale	Orientation	Contained	Hinged	Attached	Butting	Concentric
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Representation



Learning with the And-Or Graph

Let,

- f: true distribution governing the objects

Our aim,

- Learn *p* : approaches *f* by minimizing K-L Div

Learning the probability model of And-Or graph includes two phases :

- Estimating the parameters from training data for given relation set
- Learning and pursuing the relation set



Experiments on learing and sampling



Experiments on learing and sampling



Twenty-four object categories with high intra-class variability and their corresponding samples.

Experiments on learning and sampling

Predicting Missing Parts Using Learned Model.



Top-down prediction of missing parts at each stage of the relationship pursuit.

Experiments on object recognition using the And-Or graph

 We apply our inference algorithm to five object categoriesclock, bike, computer, cup, teapot.



Thank You

Reference - Jake Porway, Benjamin Yao, and Song-chun Zhu, *Learning compositional* models for object categories from small sample sets