



视觉数据集构建案例与反思

魏秀参

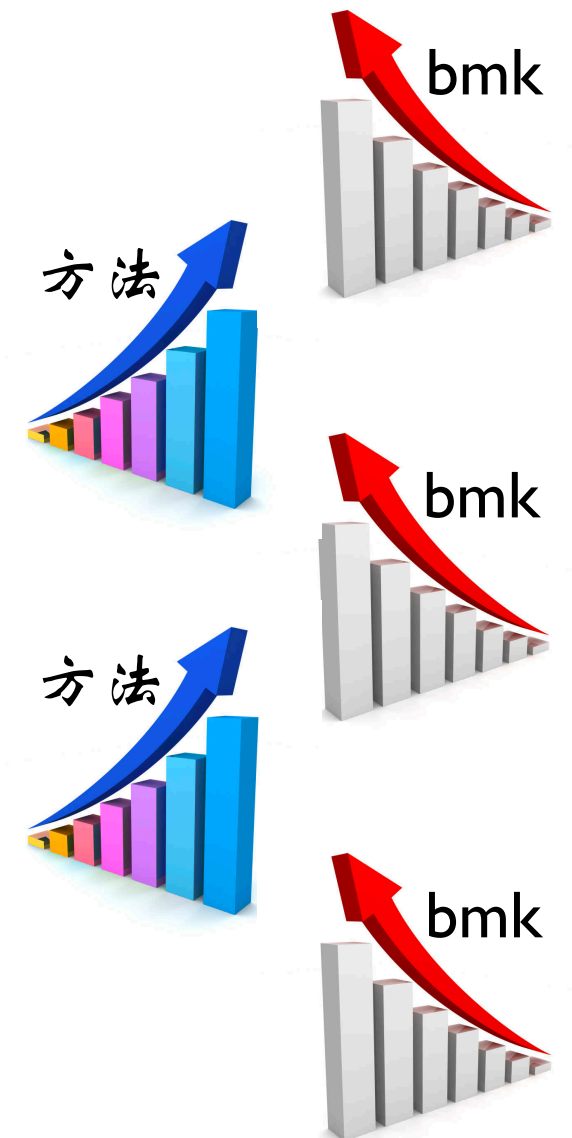
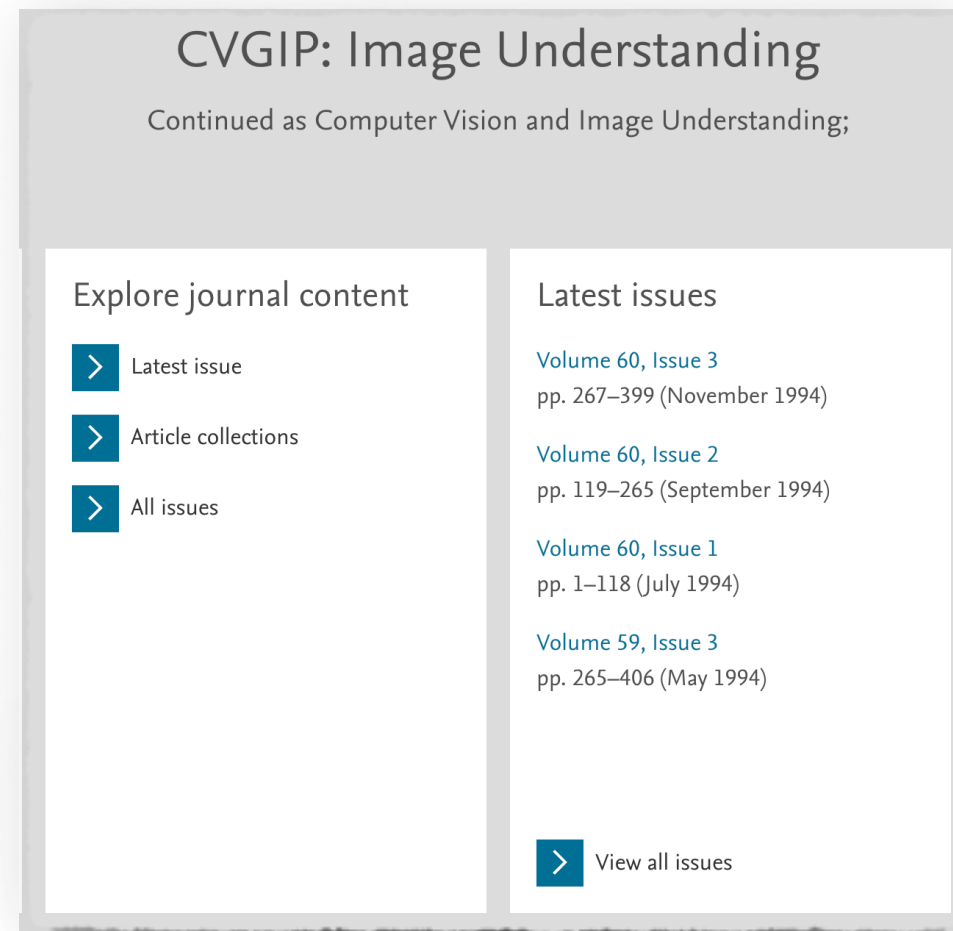
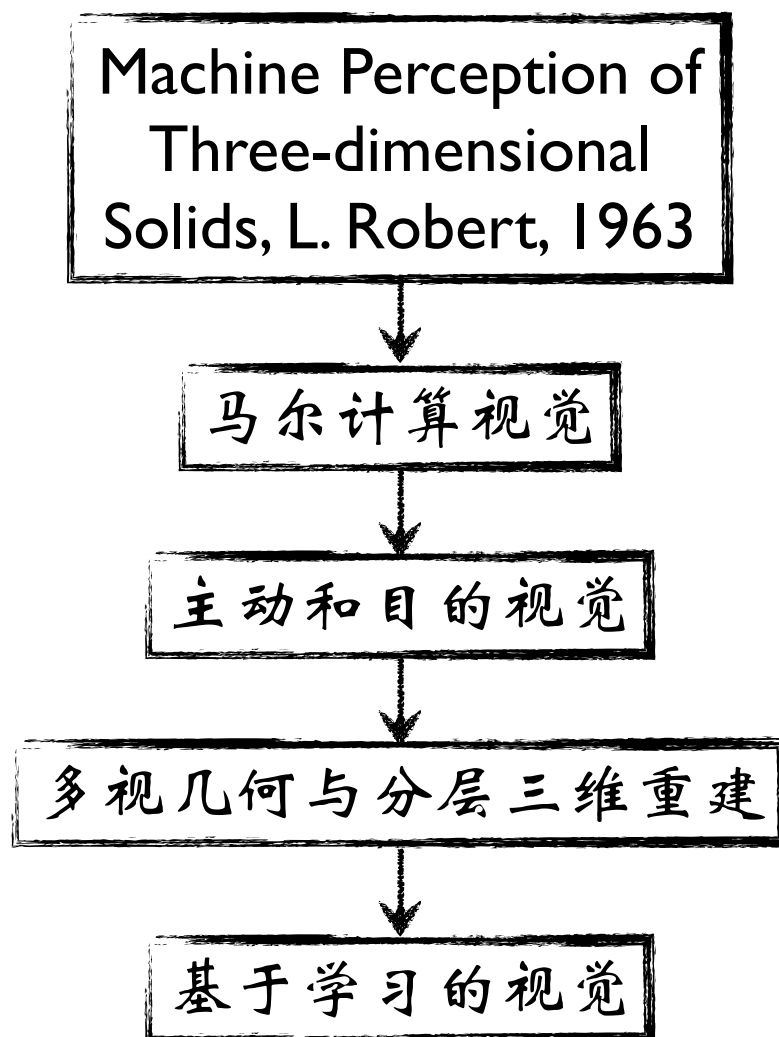
南京理工大学



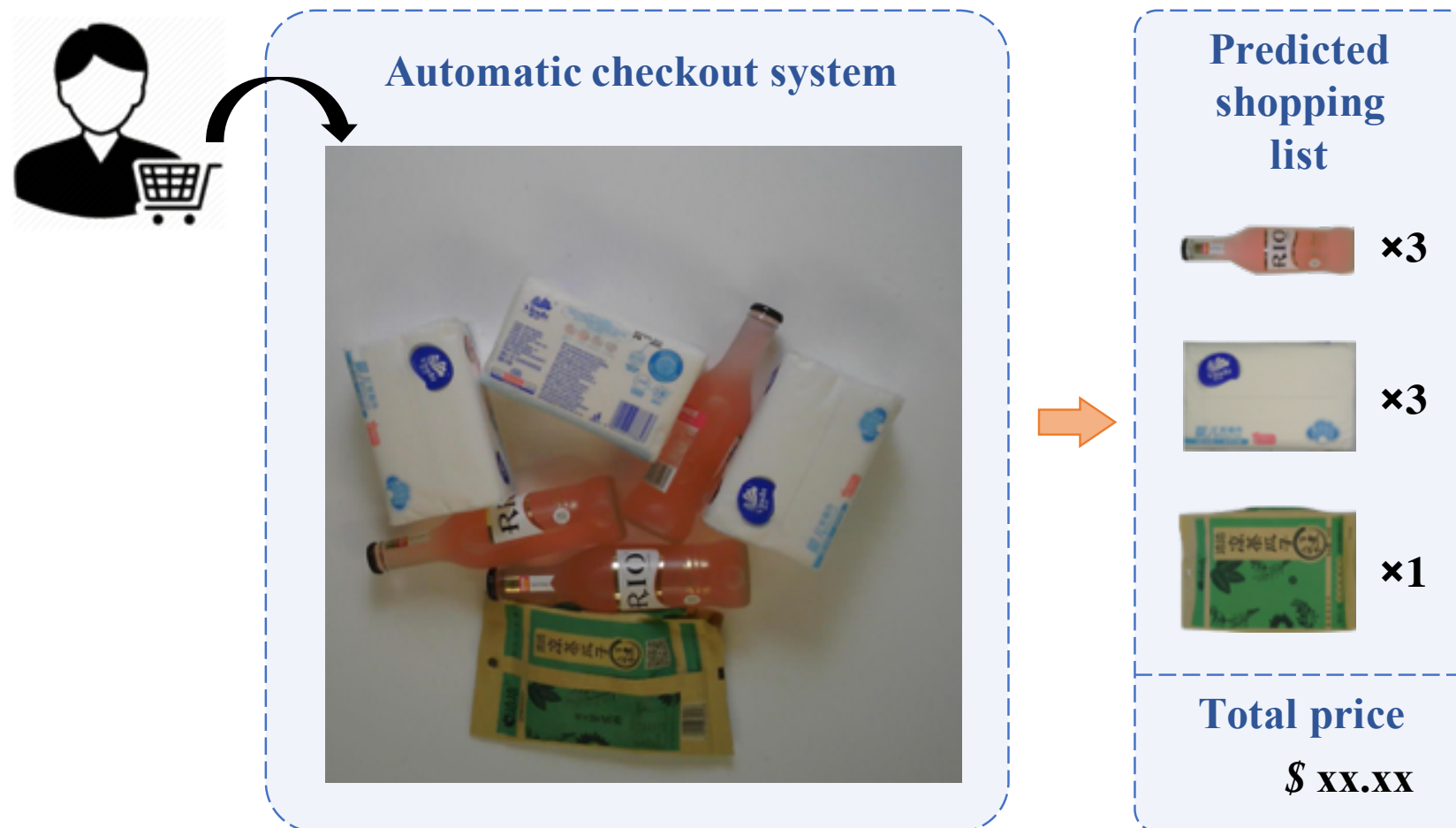
计算机视觉与视觉数据集



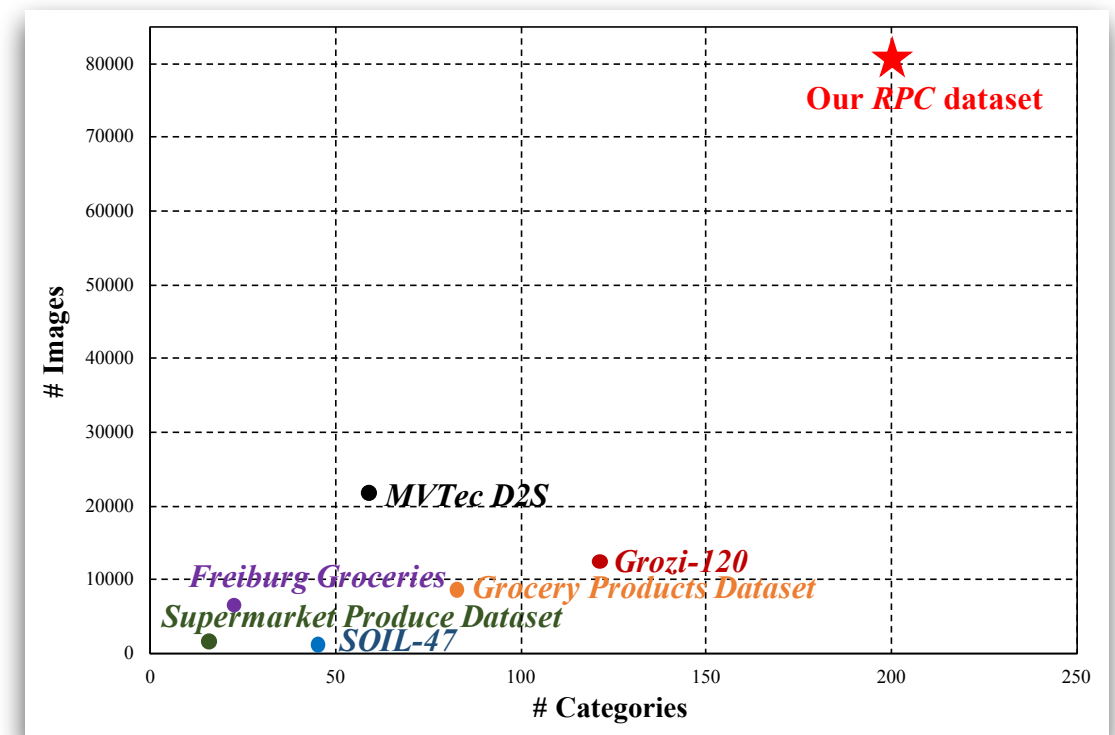
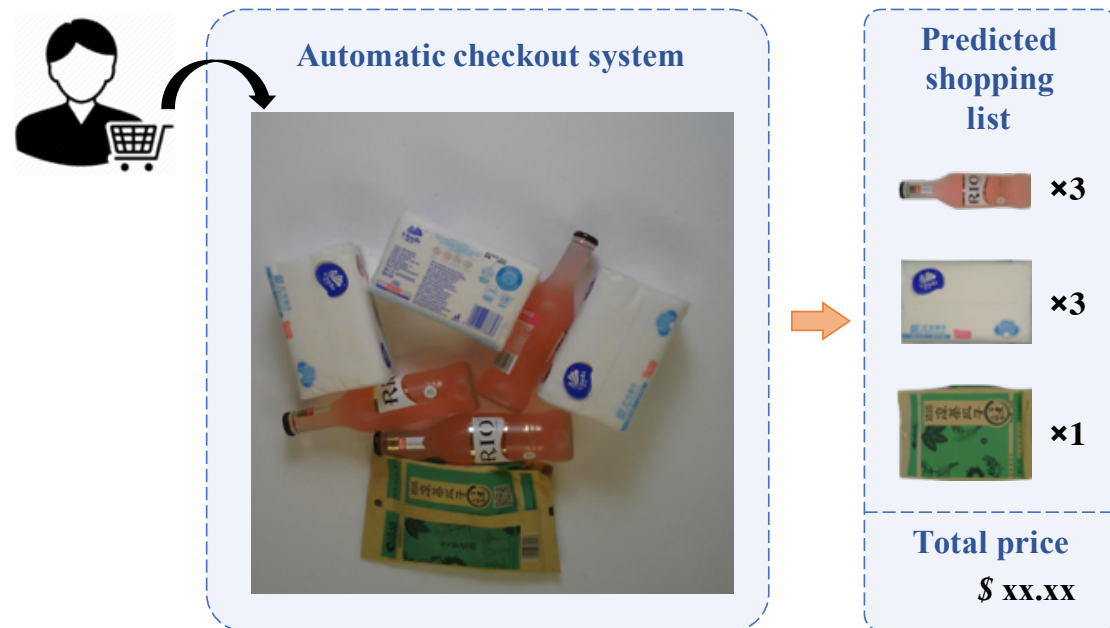
视觉发展历程与数据集的关系



视觉收银场景

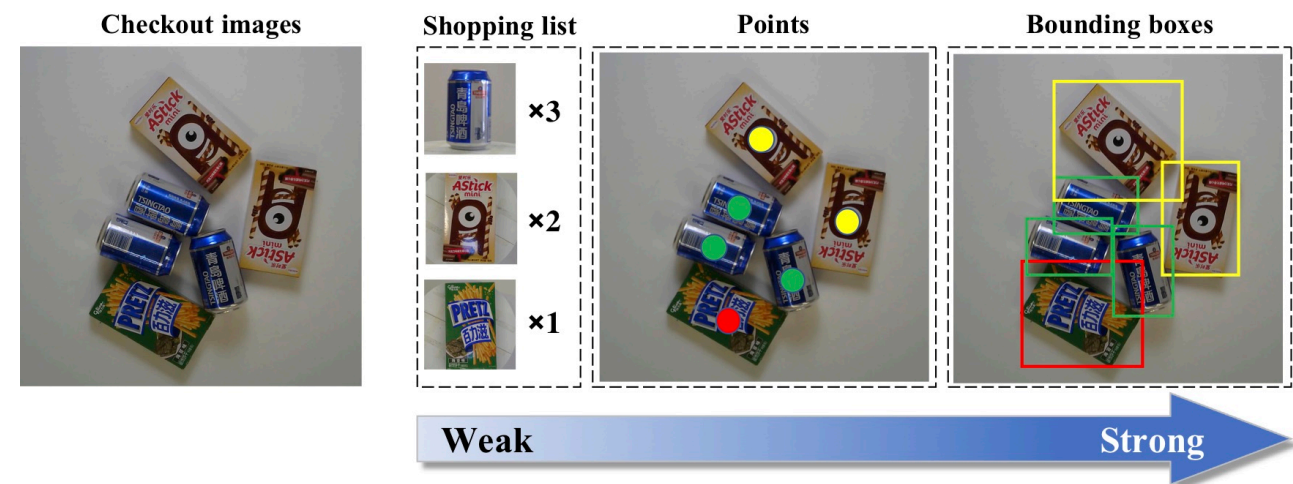


细粒度商品数据集



图像示例与监督信息

训练集



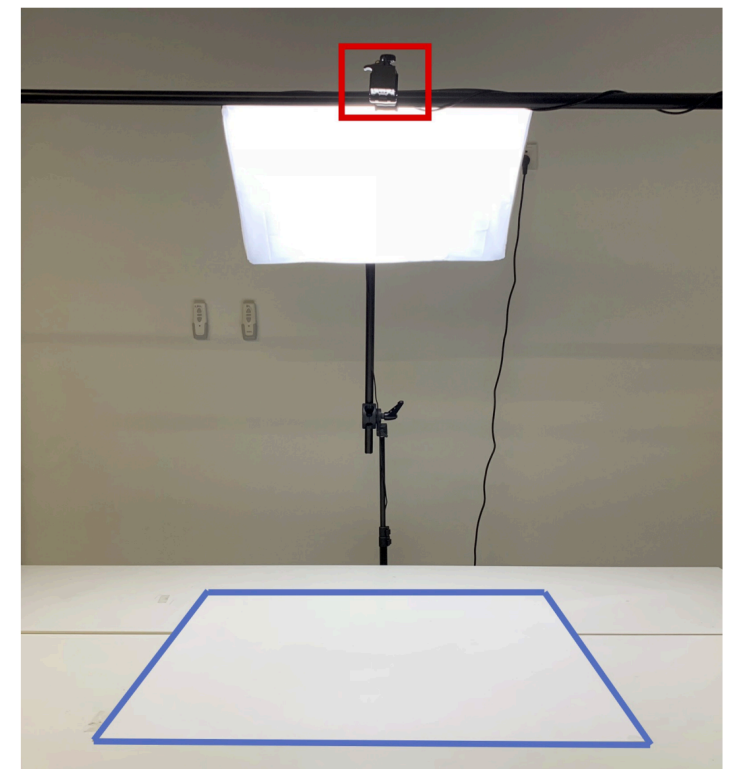
RPC



实际却是这样...



RPC

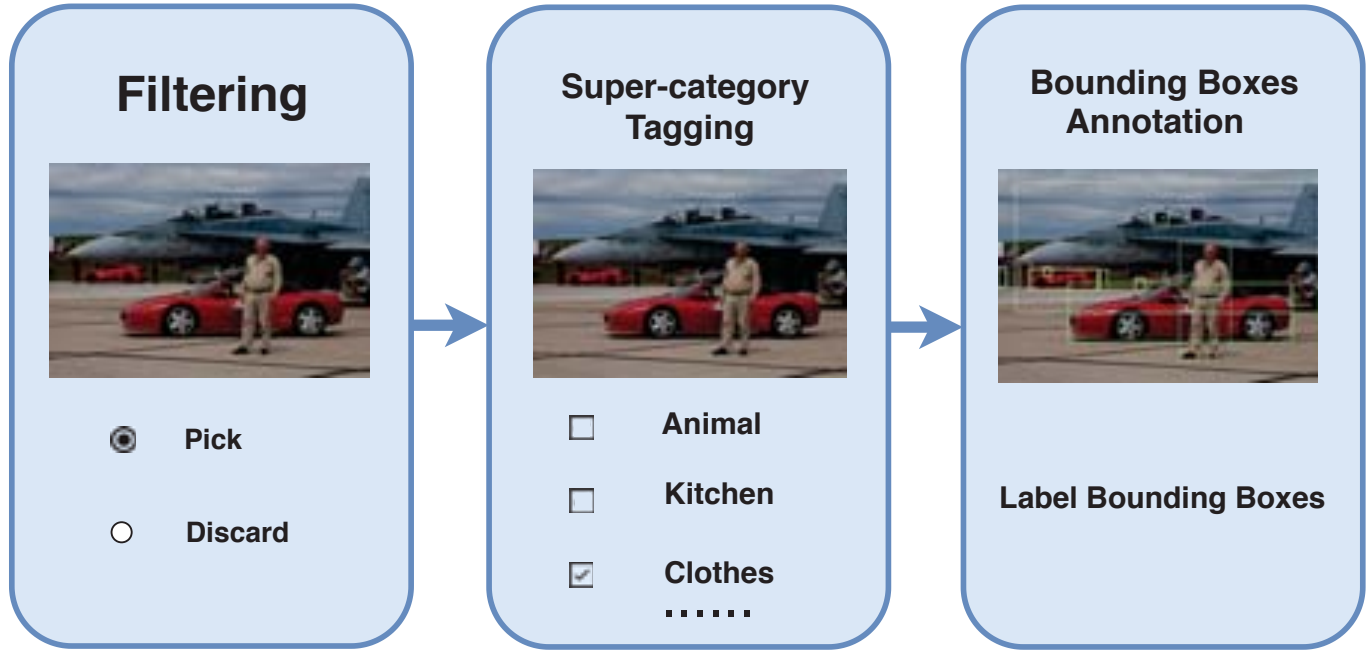


Objects365



Dataset	Images	Boxes	Categories	Boxes/img	Fully Annotated
Pascal VOC	11.5k	27k	20	2.4	Yes
ImageNet All	477k	534k	200	1.1	Yes
ImageNet Dense	80k	186k	200	2.3	Yes
COCO	123k	896k	80	7.3	Yes
OpenImages	1,515k	14,815k	600	9.8	Partial
Objects365	638k	10,101k	365	15.8	Yes

Objects365 v2 2,000k 28,500k 365 ~15



18 类	11 类
动物：水生动物	合并为：动物
动物：熊、灵长类、家养、鸟	
动物：陆地野生动物	
交通市政：其他载具及设施	合并为：交通市政
交通市政：公路车辆	
蔬菜水果：水果	合并为：食物蔬菜水果
蔬菜水果：蔬菜	
食物：食物	
工具：五金医疗	合并为：办公五金医疗
工具：办公用品	
工具：电子产品	保持：电子产品
家具：起居室	保持：起居室
家具：浴室	保持：浴室
家具：厨房	保持：厨房
人及附属品：乐器	合并为：运动乐器
人及附属品：运动	
人及附属品：衣物	保持：衣物
人及附属品：人&附件	保持：人附属

Objects365



极其常见的歧义性





反思及待解决问题

- 构建数据集是“运气活”
- 数据标注对应一种“世界观”
- 唯benchmark是否误入歧途？
- 大、更大、非常大？
- 大一统 or 小而精

构建数据集是“运气活”



- “开弓没有回头箭”
- 中途难以验证其有效性

数据标注对应一种“世界观”



图源

YFCC



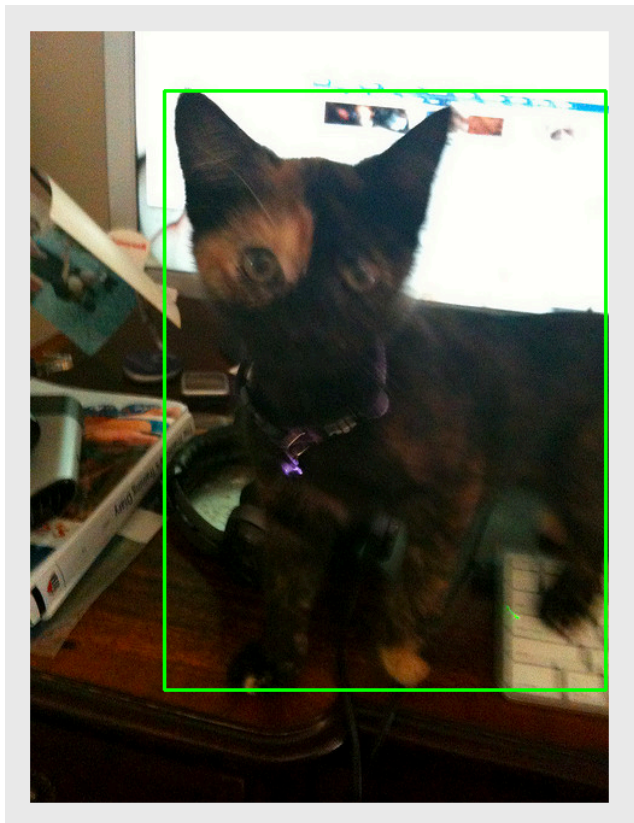
Flickr



数据标注对应一种“世界观”



标注流程

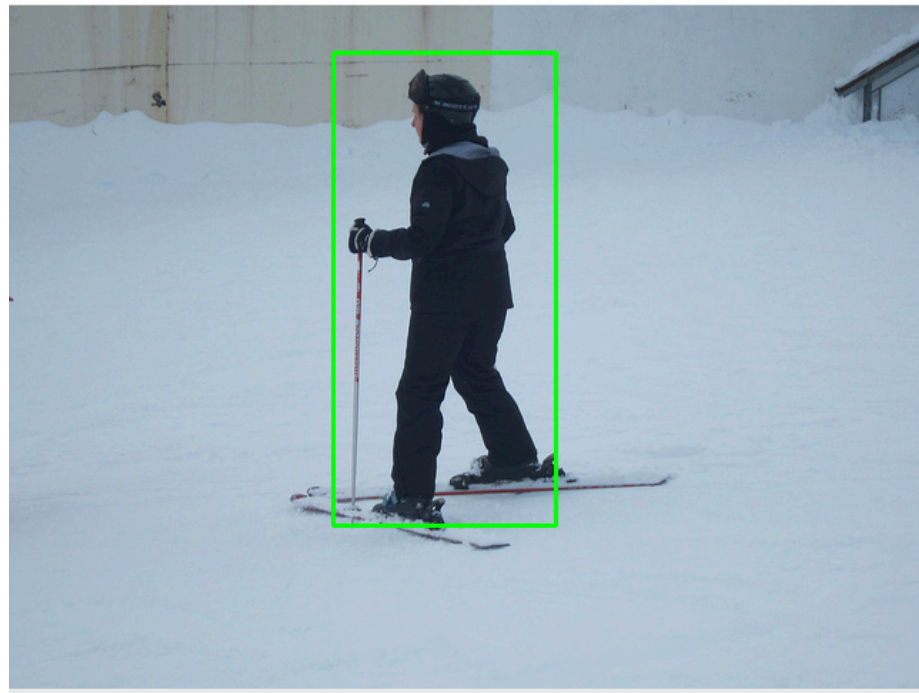


```
COCO val2014_000000179392  
Category: dog, Box: [112.48, 49.13, 365.9, 497.78]  
Category: tv, Box: [61.84, 1.8, 418.16, 260.31]  
Category: keyboard, Box: [389.23, 430.47, 90.73, 136.47]  
Category: book, Box: [0, 286.3, 140.94, 201.35]  
Category: book, Box: [1.14, 116.15, 92.44, 155.13]  
Category: cat, Box: [117.23, 42.37, 362.77, 550.68]
```

数据标注对应一种“世界观”

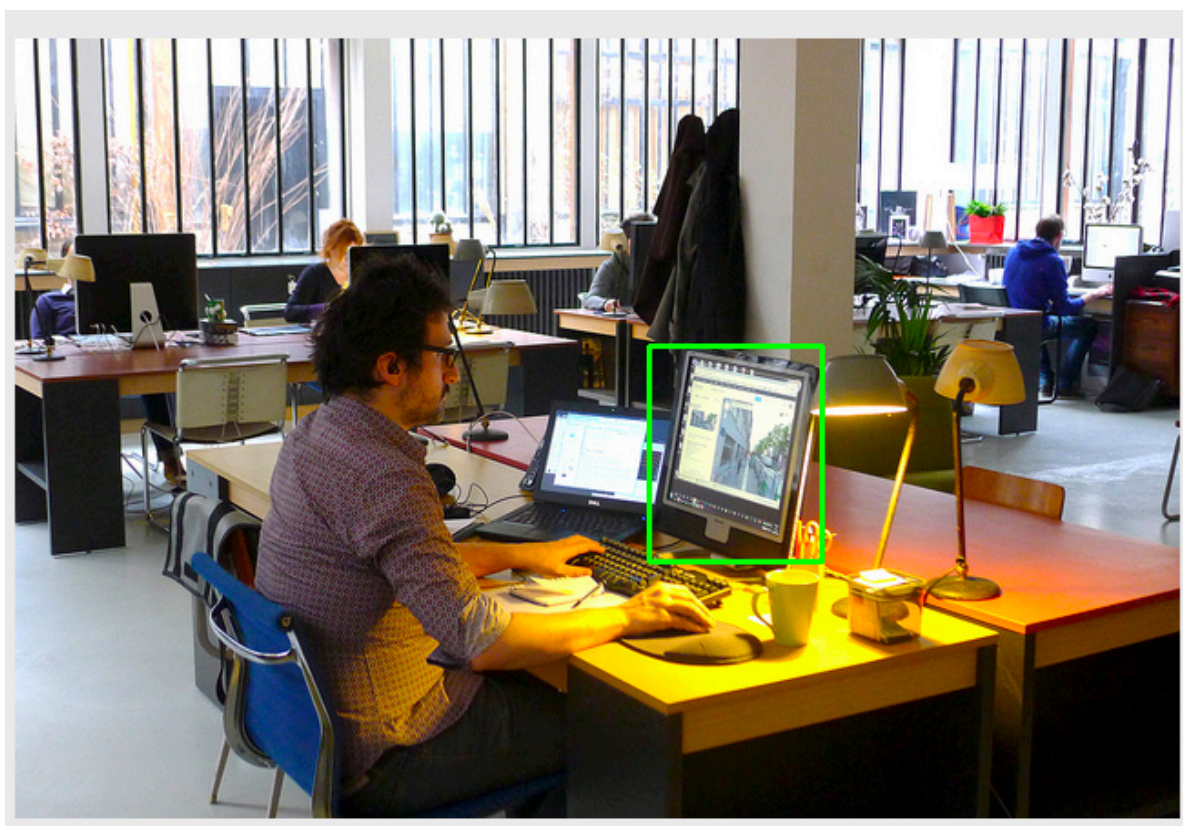


标注手法/标注培训



唯benchmark是否误入歧途?

标注错误不可避免

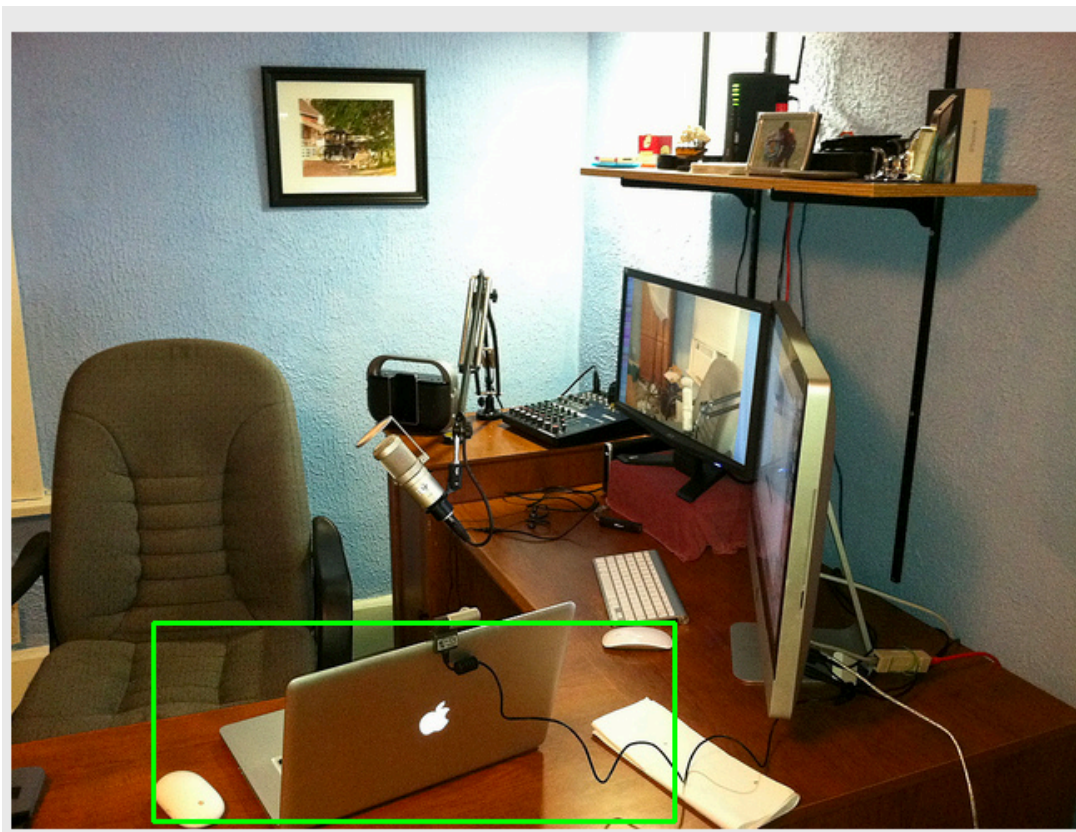


```

COCO_val2014_000000367095
Category: chair, Box: [95.5, 279.16, 79.89, 147.84]
Category: chair, Box: [69.75, 173.59, 81.97, 96.33]
Category: chair, Box: [518.09, 133.38, 58.12, 67.31]
Category: dining table, Box: [435.04, 230.08, 204.96, 190.89]
Category: person, Box: [146.64, 98.14, 44.94, 55.83]
Category: person, Box: [130.5, 118.02, 258.12, 308.98]
Category: person, Box: [541.23, 95.07, 61.98, 105.72]
Category: dining table, Box: [0, 155.8, 169.08, 130.87]
Category: cup, Box: [404.87, 291.32, 36.88, 40.6]
Category: dining table, Box: [297.15, 141.85, 59.4, 60.72]
Category: laptop, Box: [252.55, 204.15, 106.1, 71.8]
Category: keyboard, Box: [301.96, 272.94, 91.44, 36.17]
Category: chair, Box: [519.94, 233.66, 57.54, 30.8]
Category: potted plant, Box: [460.57, 117.47, 55.39, 120.7]
Category: mouse, Box: [349.55, 322.32, 25.09, 4.18]
Category: scissors, Box: [431.97, 263.31, 19.71, 28.94]
Category: person, Box: [311.28, 94.75, 40.55, 55.5]
Category: person, Box: [7.36, 108.92, 27.31, 55.22]
Category: potted plant, Box: [102.37, 141.53, 19.97, 25.64]
Category: potted plant, Box: [227.82, 94.73, 12.35, 23.69]
Category: tv, Box: [348.05, 175.14, 95.63, 112.31]
Category: tv, Box: [182.41, 111.26, 58.42, 28]
Category: tv, Box: [32.75, 106.97, 68.74, 62.53]
Category: tv, Box: [585.17, 101.12, 34.76, 32.87]
Category: chair, Box: [319.1, 124.9, 2.81, 3.39]
    
```


唯benchmark是否误入歧途?

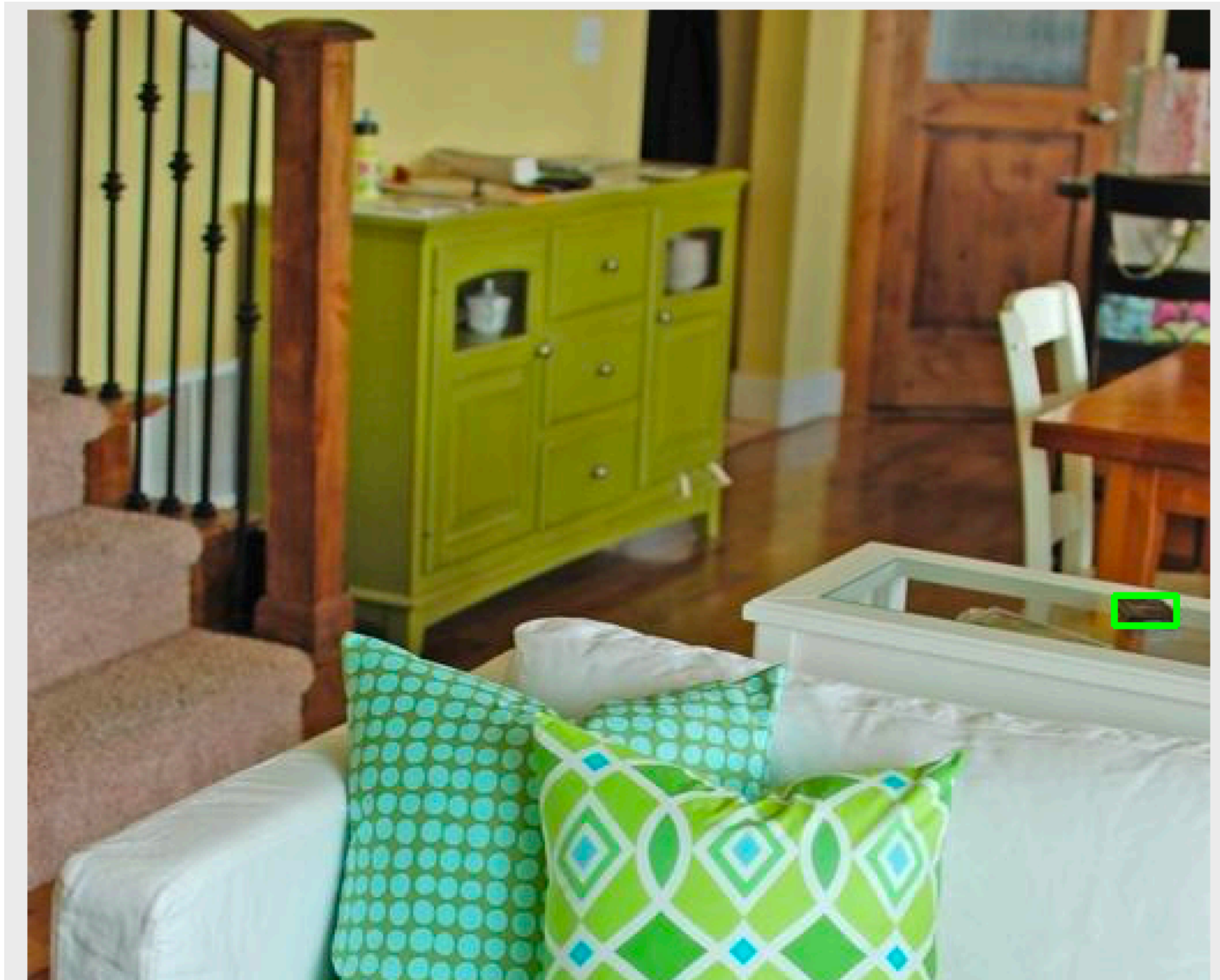
标注错误不可避免



```
COCO_val2014_000000363461
Category: tv, Box:, [355.54, 142.21, 101.72, 123.46] , isCrowd: 0
Category: tv, Box:, [438.58, 163.31, 47.3, 239.49] , isCrowd: 0
Category: chair, Box:, [0, 185.03, 205.59, 239.52] , isCrowd: 0
Category: laptop, Box:, [125.96, 341.27, 214.24, 130.27] , isCrowd: 0
Category: mouse, Box:, [85.05, 354.73, 313.28, 118.43] , isCrowd: 0
Category: keyboard, Box:, [348.41, 309.06, 58.87, 48.16] , isCrowd: 0
```


唯benchmark是否误入歧途?

标注错误不可避免

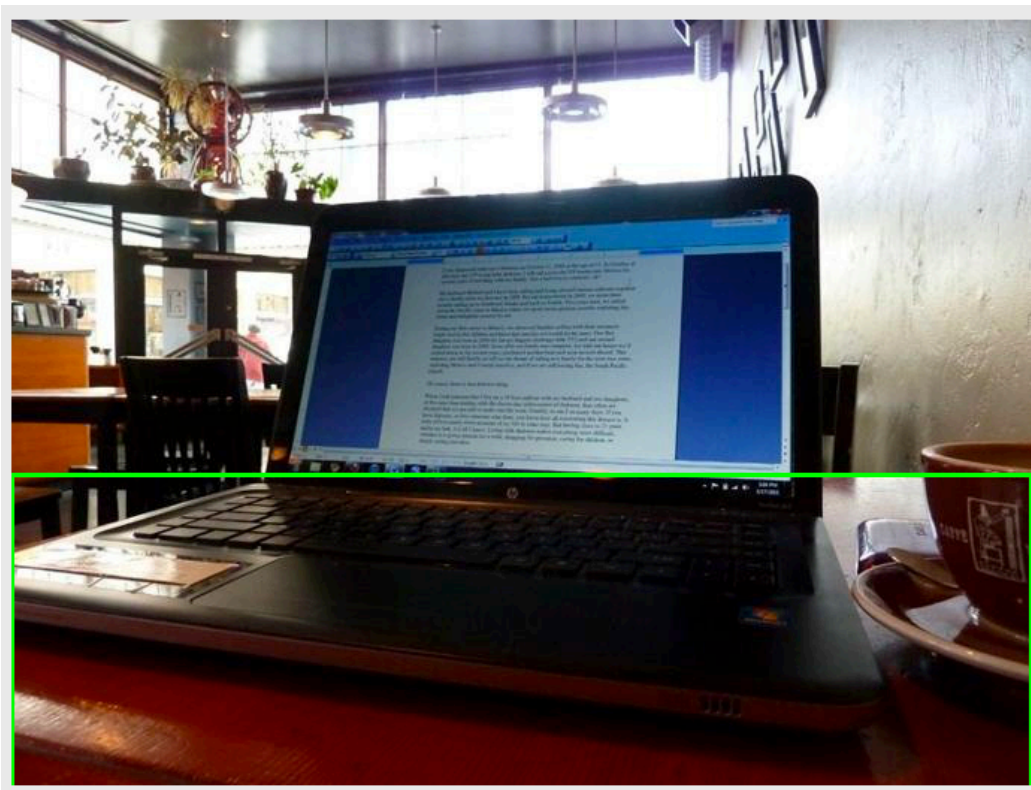


“手机”漏标

唯benchmark是否误入歧途？



标注错误不可避免



错标为desk，从上下文可看出是coffee/dinning table



错标为chair，上下文看应为sofa



唯benchmark是否误入歧途?

标注错误不可避免

- 漏标 — IFP
- 多标 — IFN
- 错标 — IFP + IFN
- 歪标 — $\alpha \times (IFP + IFN)$

Instance数	漏标	多标	错标	歪标
8840	230 / 2.6%	119 / 1.3%	30 / 0.34%	2456 / 27.7%



唯benchmark是否误入歧途?

标注错误不可避免，那怎么办？

- 设计评价bmk的指标
- 更加科学的标注流程、规则、培训等
- 改变标注的监督信息，比如对于检测改为点标注
- 多bmk协同评价
- ...

大、更大、非常大？



越大一定越好吗？

- 各种 “large-scale” ...
- 标注粒度的黄金标准为何？
- 数据红利的天花板有多高？性价比是否合算？



鹅



天鹅



疣鼻天鹅

大一统 or 小而精



哪条路更可行?

- 人类视觉并没有各种小型bmk
- BERT成功了，但大一统视觉数据集存在吗?
- 越来越多task-specific数据集被提出

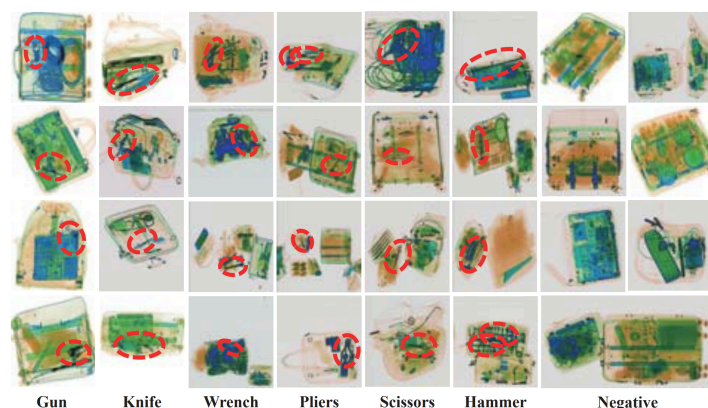


Gallery Pool

Black Re-ID

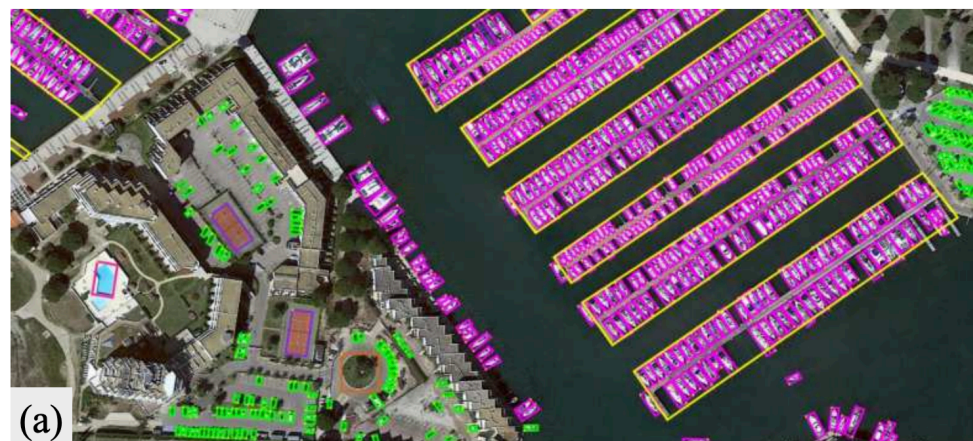


CrowdHuman



Gun Knife Wrench Pliers Scissors Hammer Negative

SIXray



(a)

DOTA

谢谢各位专家！
请大家批评指正！
