

Places Challenge 2017: Towards Deep Scene Understanding

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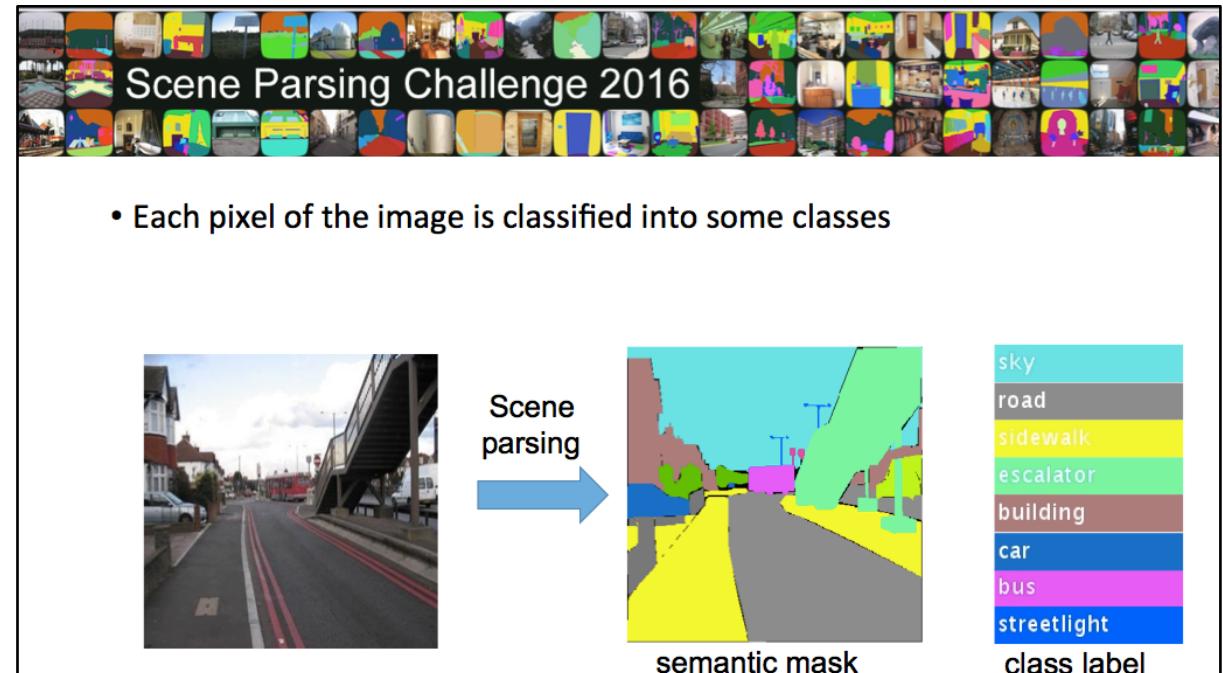
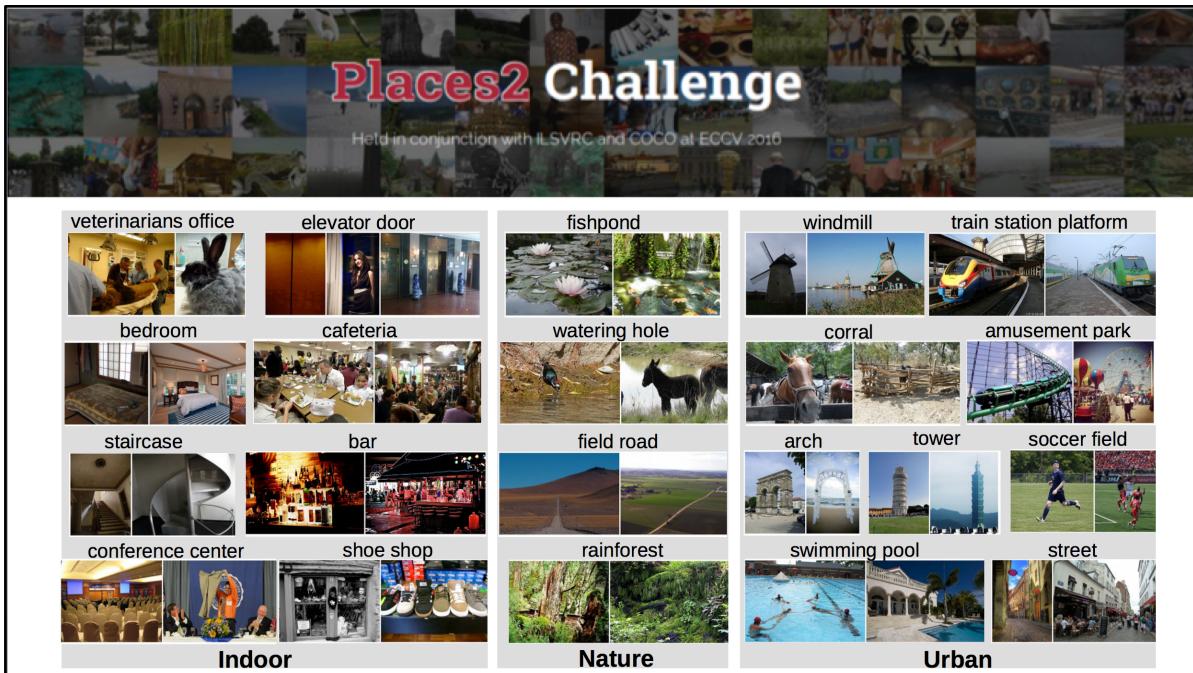


Sanja Fidler
University of Toronto



Antonio Torralba
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Last year's challenge at ECCV



ADE Dataset



- ceiling
- wall
- wall
- window (arch)
 - └ pane (glass)
 - └ figurine
- door frame
- double door
 - └ door
 - └ handle
- tray
- figurine
- refrigerator (crop)
- cabinet
 - └ door
 - └ knob
 - └ door
 - └ knob
 - └ door
 - └ knob
- jar
- cabinet
 - └ door
 - └ knob
- toaster
- blender
- pot
- box
- worktop
- cabinet
 - └ door
 - └ knob
- cabinet
 - └ drawer
 - └ knob
- microwave
 - └ door
 - └ knob
- button (door release)
- outlet
- pot
- sink
 - └ faucet
- soap dispenser
- spice rack
- coffee maker
- knife set
- knife set
- range
 - └ button panel
 - └ dial
 - └ dial
 - └ dial
 - └ dial
 - └ screen time
- stove
 - └ burner
 - └ burner
 - └ burner
 - └ burner
- oven
 - └ door
 - └ handle
- chair
 - └ back
 - └ seat (fabric)
 - └ leg
 - └ leg
 - └ leg
- chair
 - └ back
 - └ seat (fabric)
 - └ leg
 - └ leg
 - └ leg
- chair
 - └ back
 - └ seat (fabric)
 - └ leg
 - └ leg
 - └ leg
- chair
 - └ back
 - └ seat (fabric)
 - └ leg
 - └ leg
 - └ leg
- side table (crop)
- rug
- sofa (crop)
- cushion
- cushion
- cushion
- floor (tile)
- carpet
- bowl
- light switch
- napkin rack

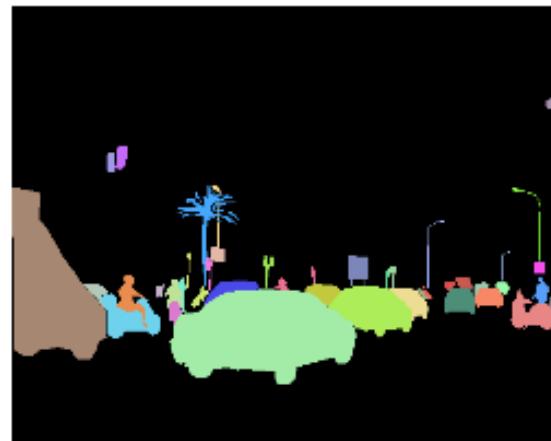
New tasks this year...



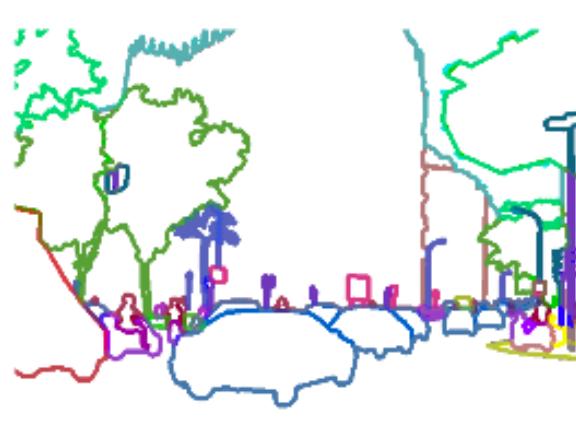
Scene Parsing



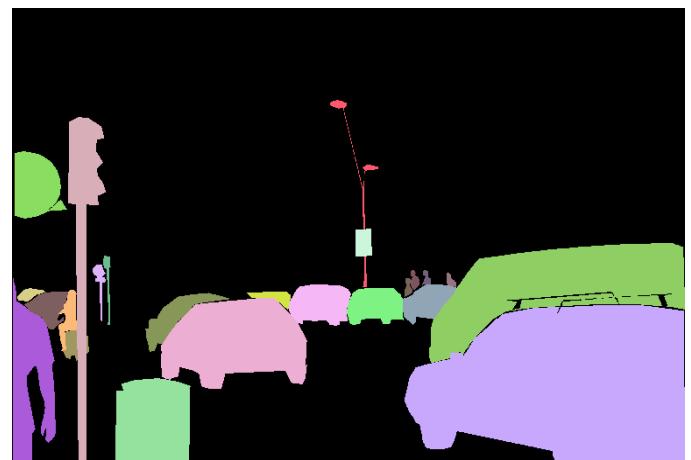
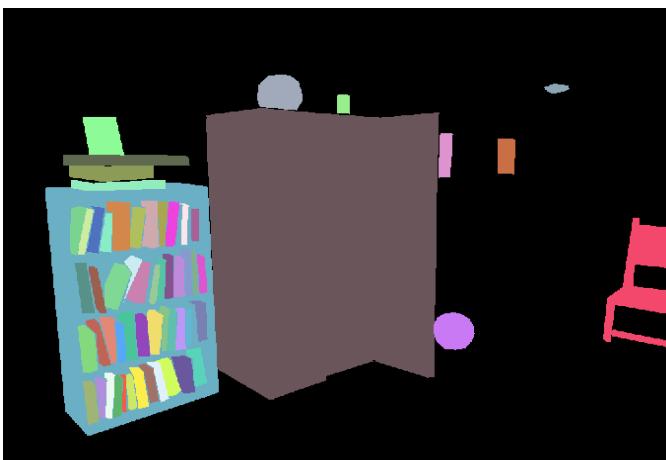
Instance Segmentation



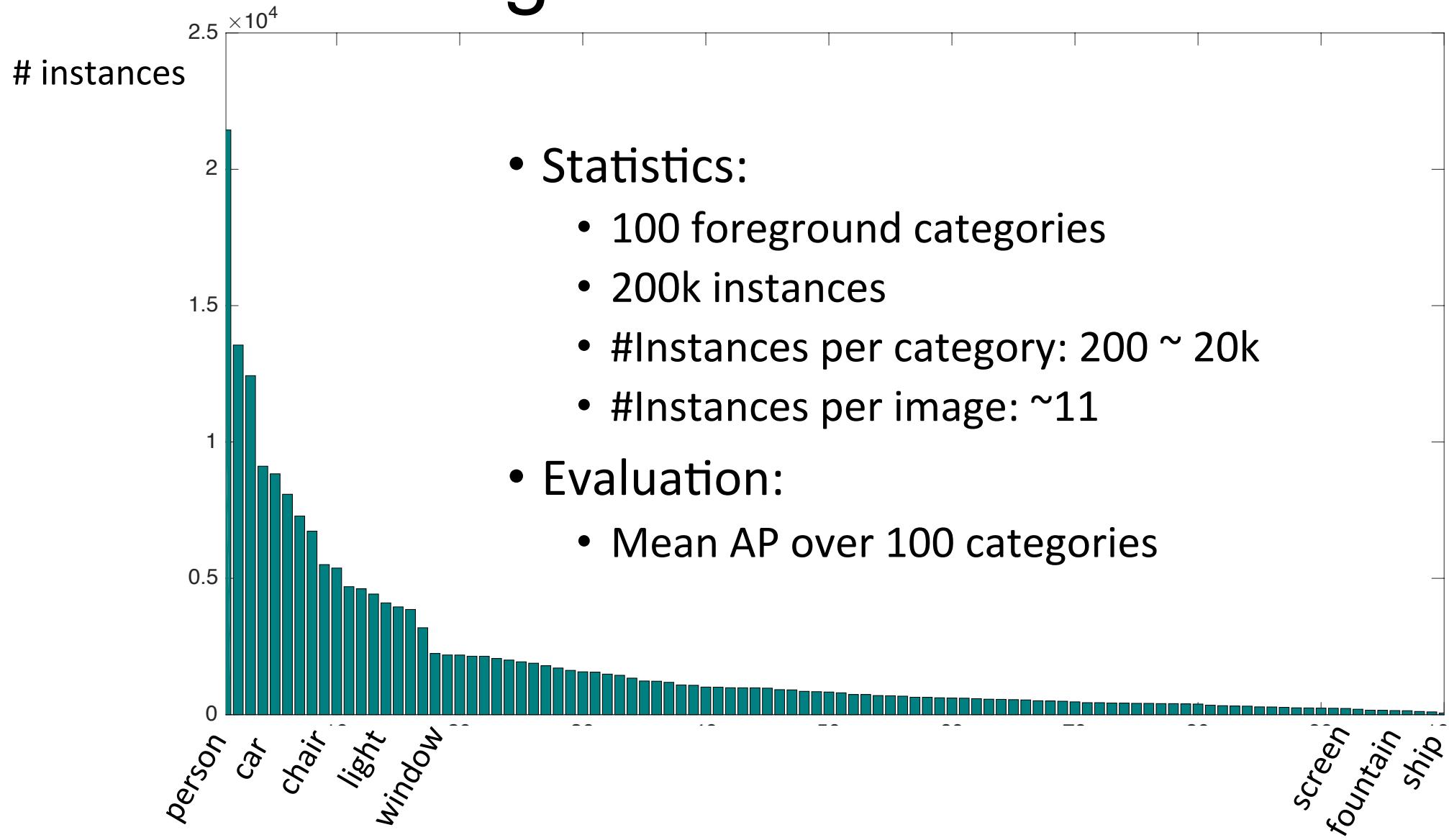
Semantic Boundary Detection



Instance Segmentation



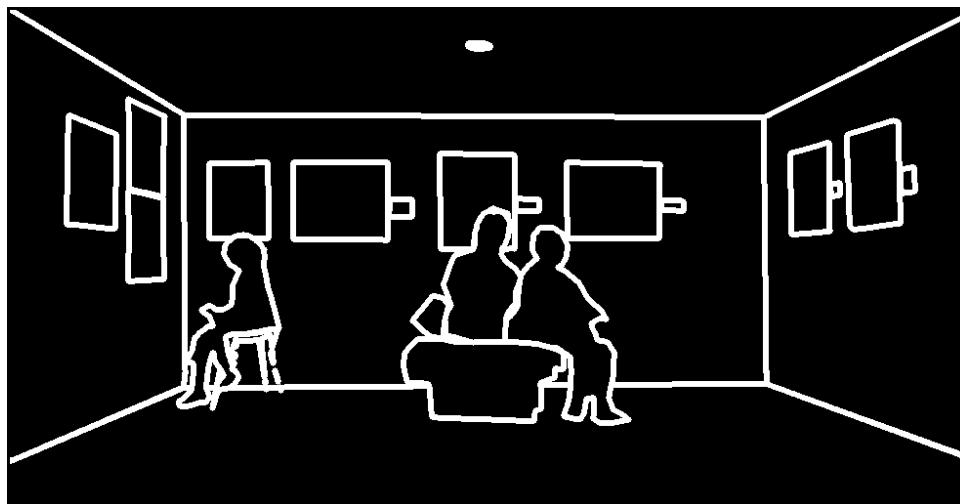
Instance Segmentation



Semantic Boundary Detection



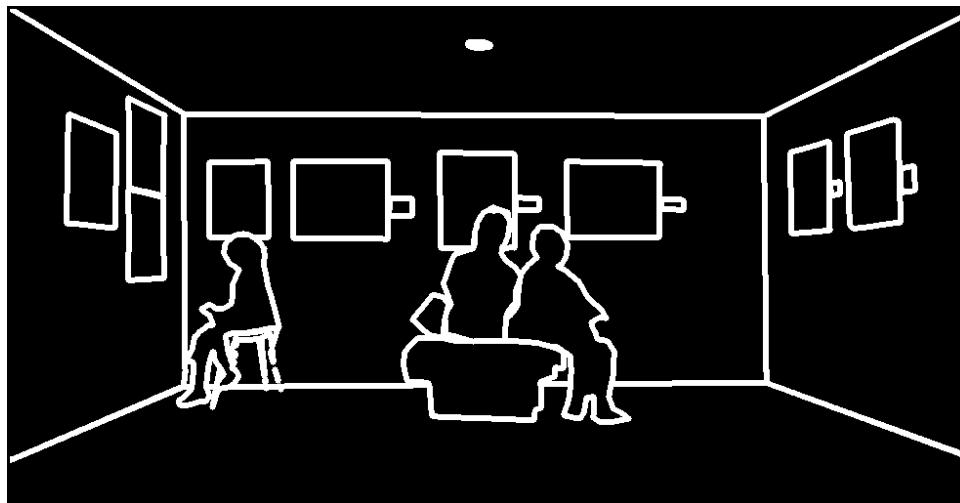
Perceptual Edges



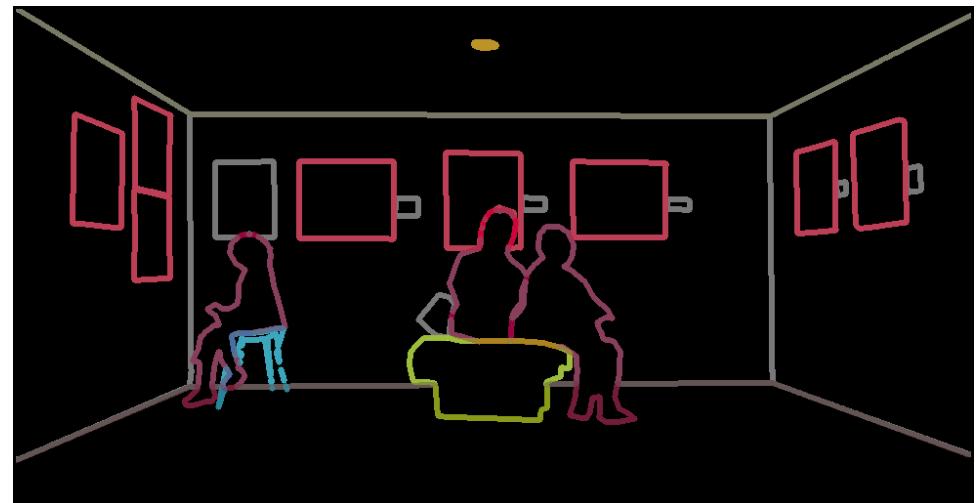
Semantic Boundary Detection



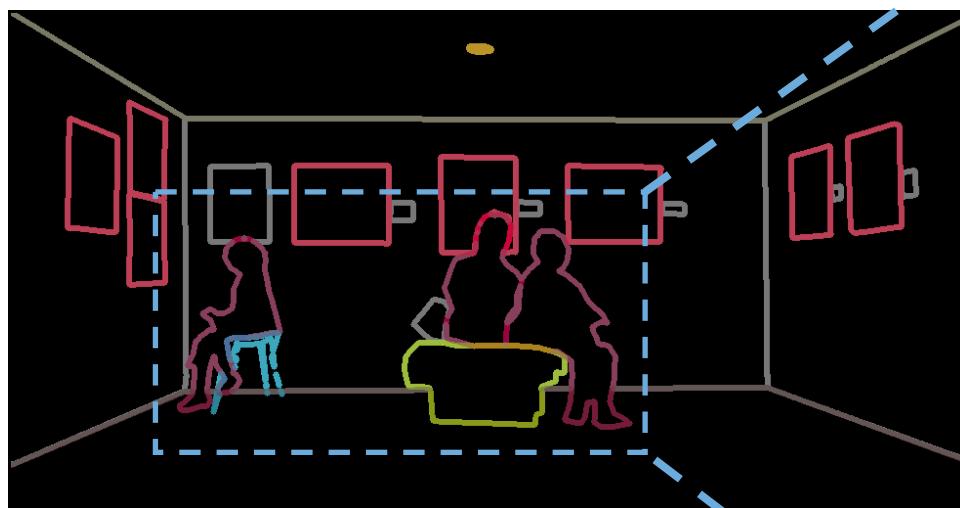
Binary Edges



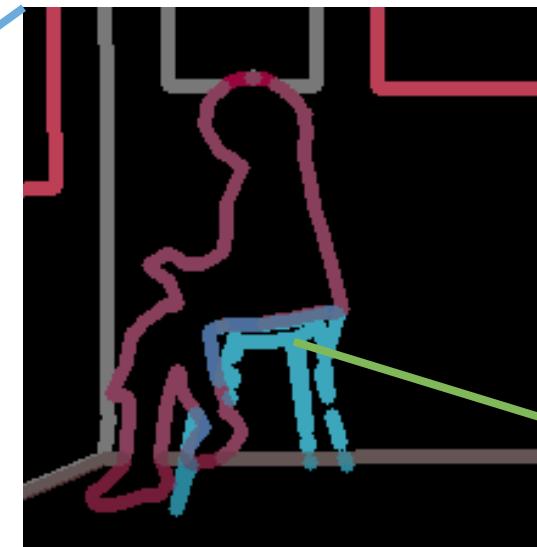
Category-aware Semantic Boundaries



Semantic Boundary Detection

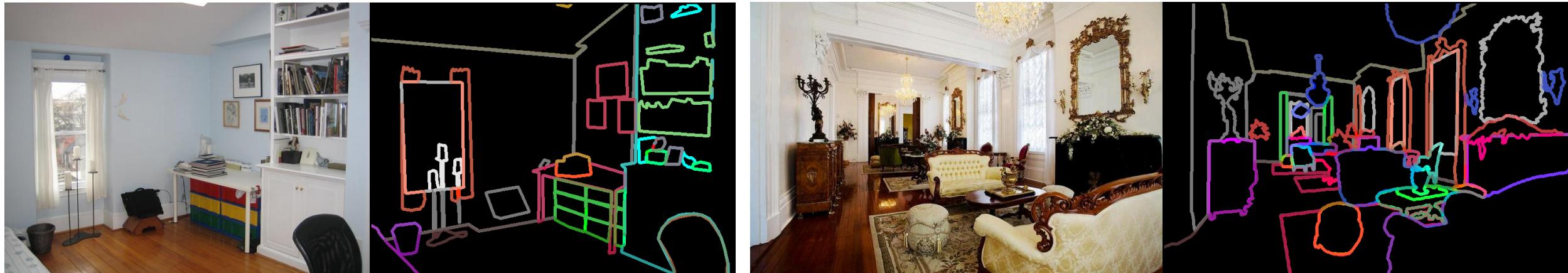


Boundaries reveal object interactions



Semantic Boundary Detection

- 150 categories
- Inter-class boundaries
- Intra-class boundaries
- Evaluation:
 - F-measure at optimal dataset scale (F-ODS)



Results – Scene Parsing

Final Score = (mean IoU + pixel accuracy) / 2

Team Name	Final Score
CASIA_IVA_JD	0.5547
WinterIsComing	0.5544
xdliang	0.5447
lijc15	0.5294
...	...
baseline-DilatedNet	0.4567

CASIA_IVA_JD
Jun Fu, Jing Liu, Longteng Guo, Haijie
Tian, Fei Liu, Yong Li, Yongjun Bao,
Weipeng Yan, Hanqing Lu
CASIA IVA and JD.com

WinterIsComing
Riwei Chen, Qi Chen, Xinglong Wu,
Yifan Lu, Yudong Jiang, Linfu Wen
Toutiao AI Lab, ByteDance

- * We received 30 submissions from 10 teams in this task. Full ranking can be found on places challenge website.

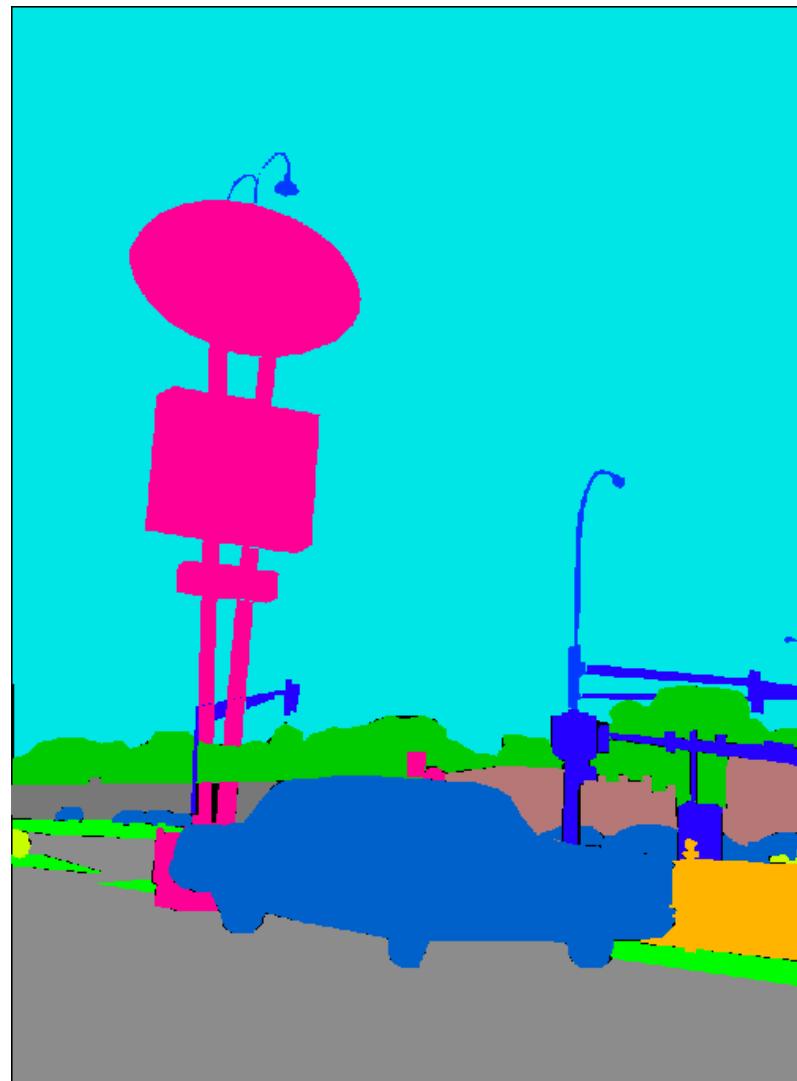
Sample Results

Scene Parsing

Image



Ground Truth



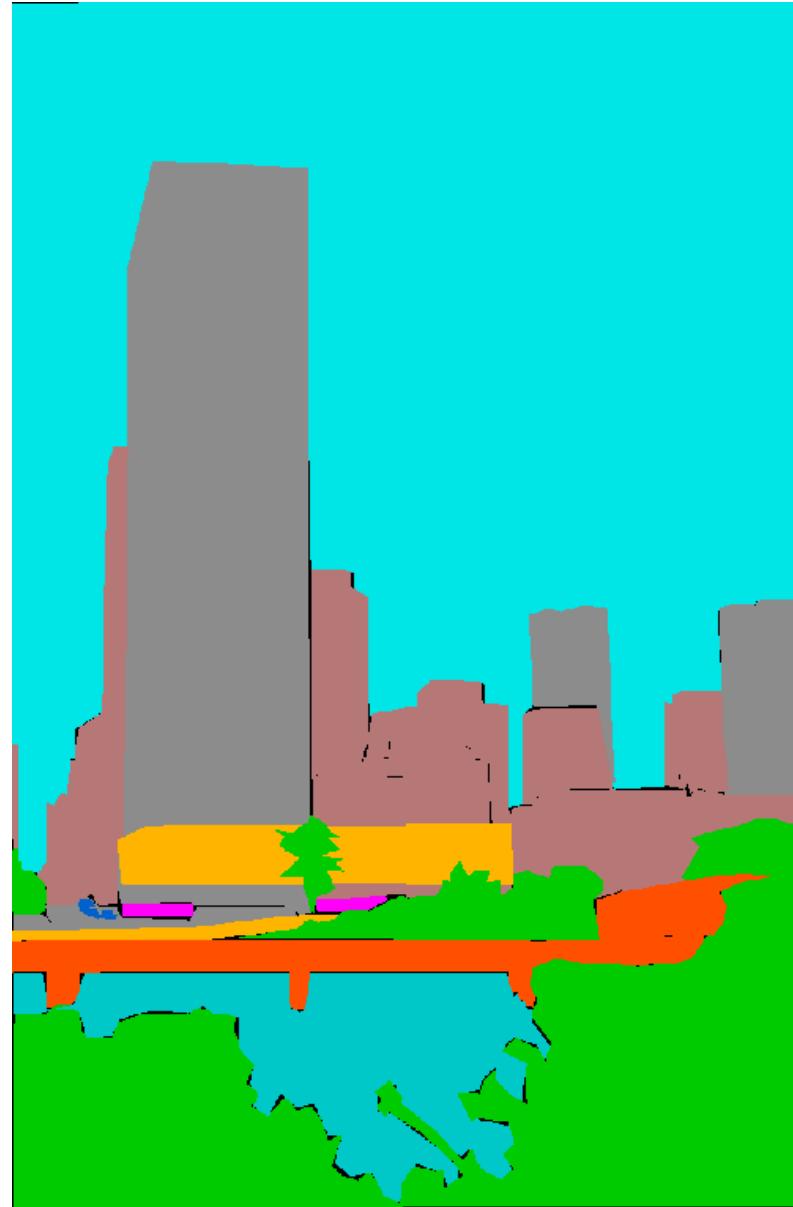
Prediction



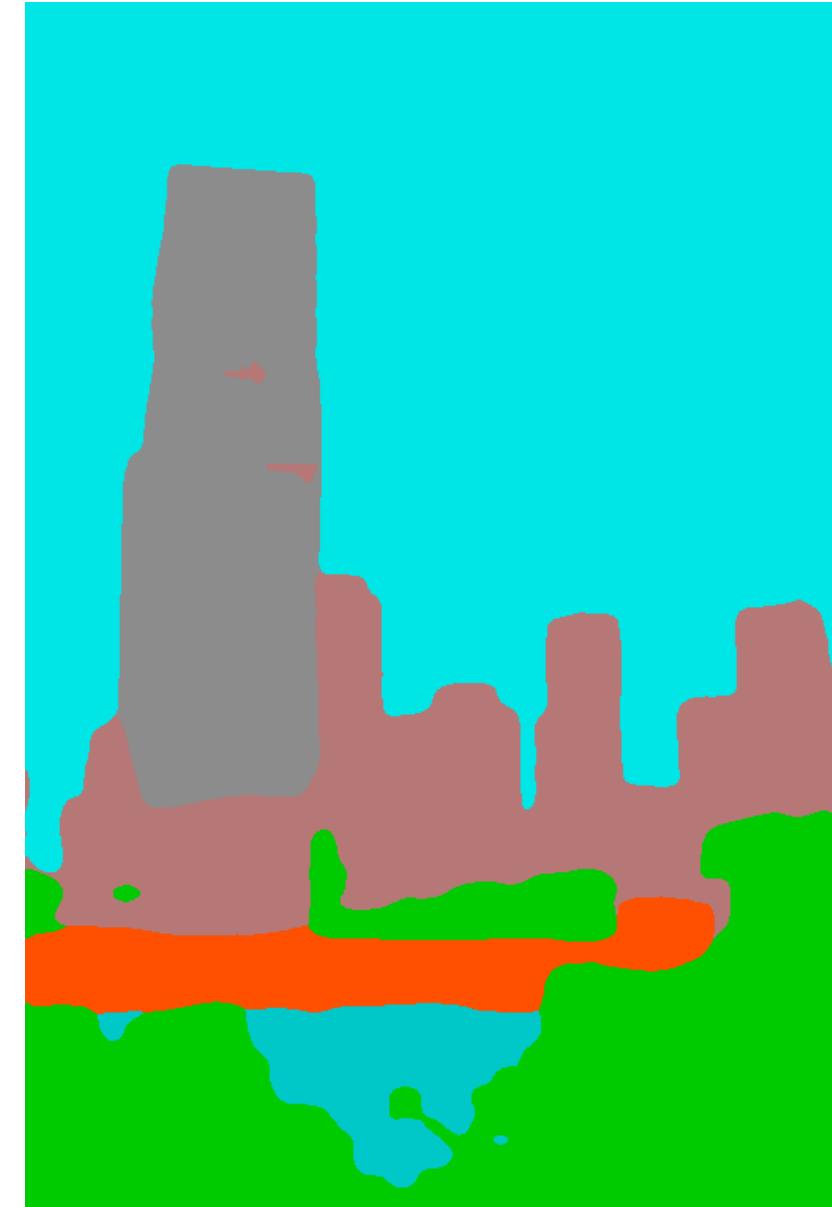
Image



Ground Truth



Prediction



Results – Instance Segmentation

Team Name	mean AP
Megvii (Face++)	0.2977
G-RMI	0.2415
BlueSky	0.1551
...	...
baseline	0.200

Megvii (Face++)
*Tete Xiao, *Ruixuan Luo, *Borui Jiang,
Shuai Shao, Yuning Jiang, Yadong Mu,
Jieqi Shi, Chi Zhang, Jian Sun

Megvii Research and Peking University

G-RMI
Alireza Fathi, Nori Kanazawa, Kai Yang,
Kevin Murphy
Google Research Machine Intelligence

- * We received 15 submissions from 5 teams in this task. Full ranking can be found on places challenge website.

Sample Results Instance Segmentation

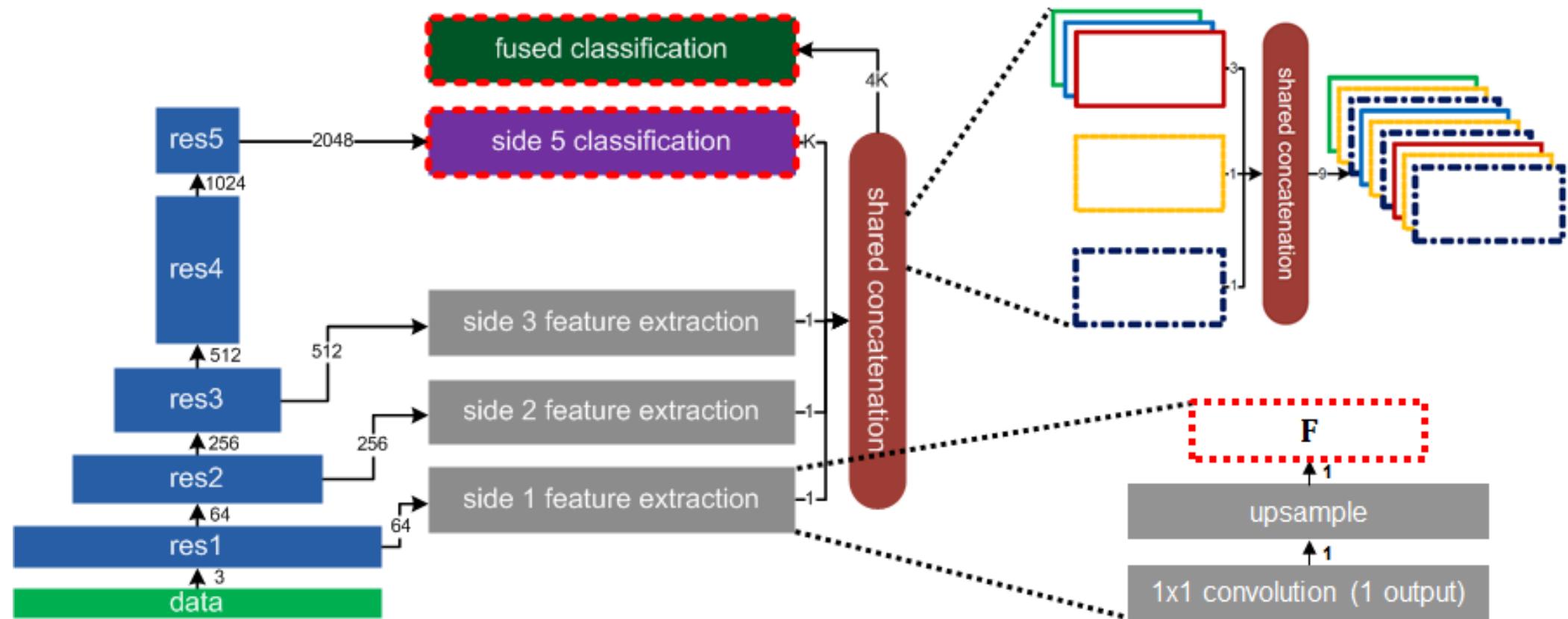




Results – Semantic Boundary Detection

State-of-the-art: CASENet CVPR'17

<http://www.merl.com/research/license#CASENet>



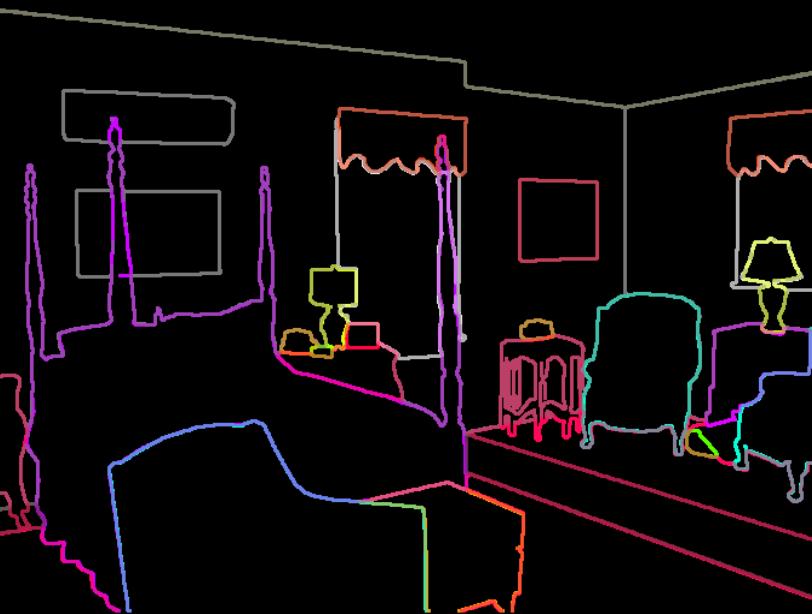
Sample Results

Semantic Boundary Detection

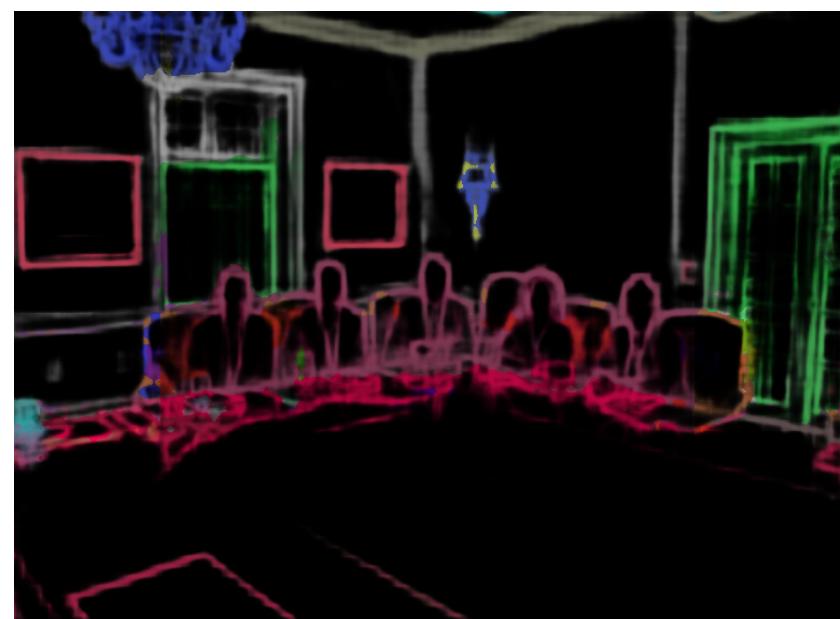
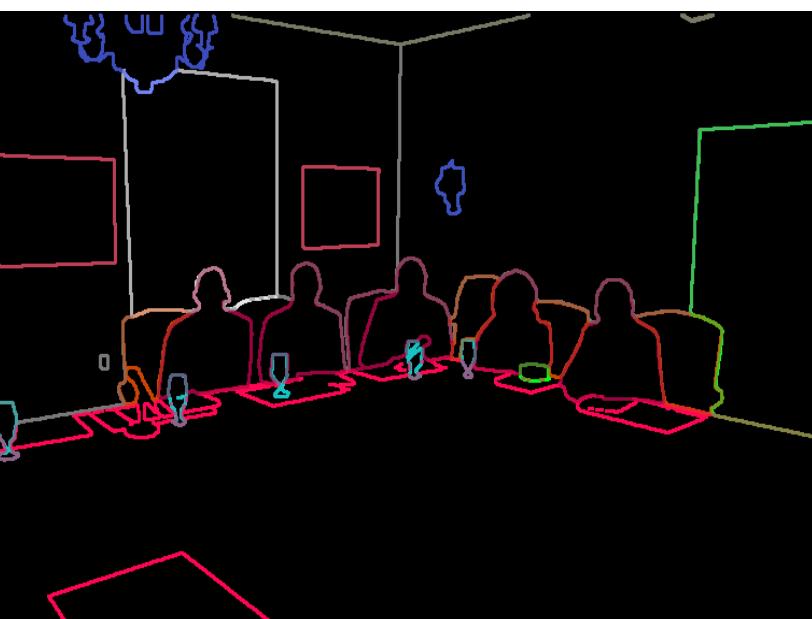
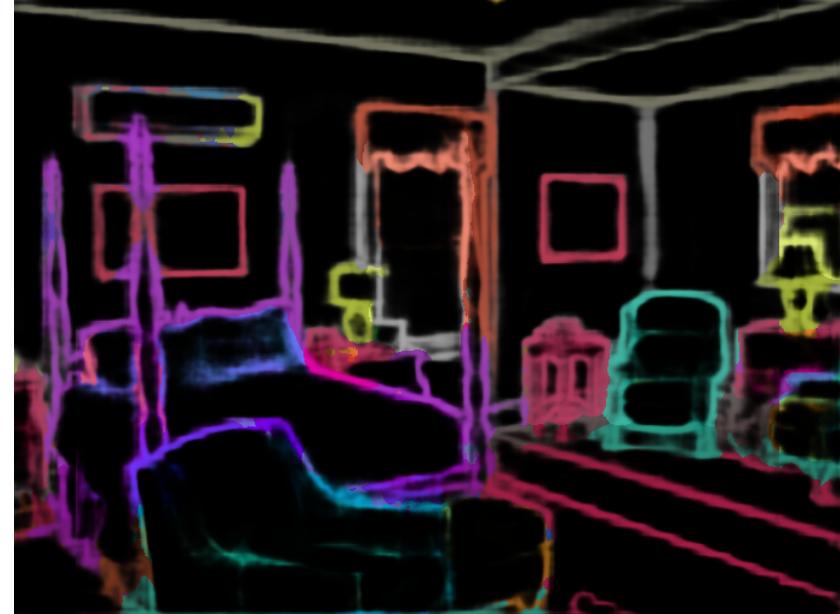
Image



Ground Truth



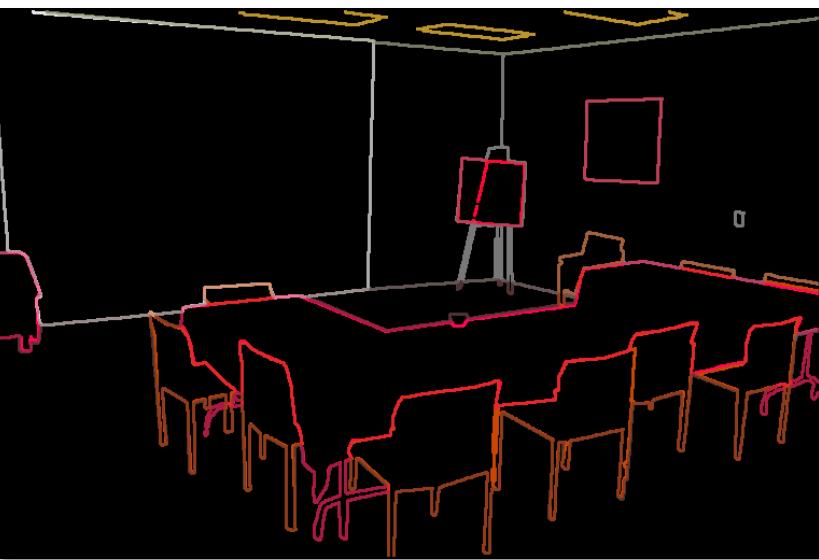
Prediction



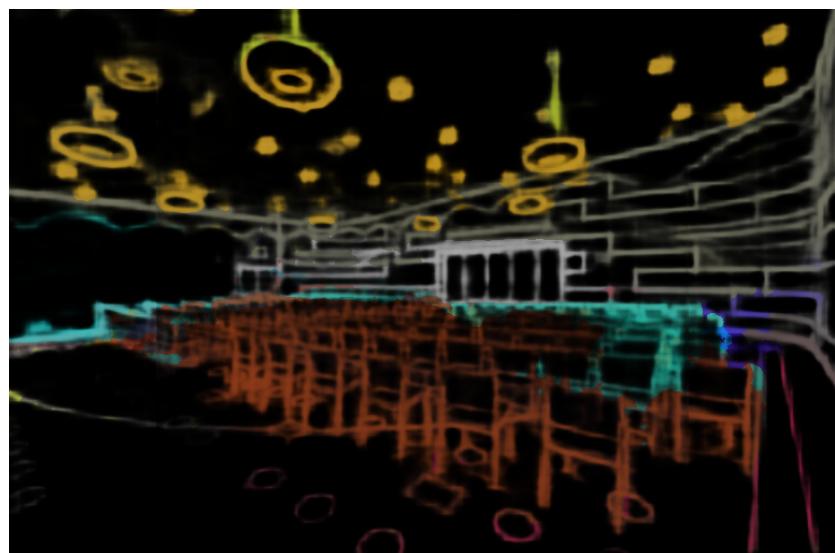
Image



Ground Truth



Prediction



Awards

Winner of Scene Parsing:

CASIA_IVA_JD

Jun Fu, Jing Liu, Longteng Guo, Haijie Tian, Fei Liu,
Yong Li, Yongjun Bao, Weipeng Yan, Hanqing Lu

CASIA IVA and JD.com

**Prize: Titan Xp GPU
Sponsored by: NVIDIA**



Awards

Winner of Instance Segmentation:

Megvii (Face++)

*Tete Xiao, *Ruixuan Luo, *Borui Jiang, Shuai Shao,
Yuning Jiang, Yadong Mu, Jieqi Shi, Chi Zhang, Jian Sun

Megvii Research and Peking University

Prize: Titan Xp GPU
Sponsored by: NVIDIA

