



Auto Rickshaw Detection Challenge

NCVPRIPG '17 CVIT, IIIT Hyderabad





Autonomous Navigation on Indian Roads

- Autonomous Navigation research has mostly been focussed on western road conditions.
- Indian Roads presents scenes which are much more complex.





India Specific Labels

- India specific labels needed to be added to datasets.
 - Auto Rickshaws.
 - Animal.
 - Poth holes/ Muddy roads / Bumps.
 - Trucks loaded with variety of objects.
- Need enough occurrences of these labels.







Traffic Participants with different Behaviour

- Auto Rickshaws and bikes follow different and unpredictable driving trajectories.
- Hence we need to treat them as special cases.
- We decided to begin with detection for Auto Rickshaws.





Auto Rickshaw Detection Dataset

- 1000 images with bounding box annotations around auto rickshaw instances.
- 200 testing images
- Labels available in format same as Pascal VOC.
- Metric : VOC Metric
 - A detection is considered "correct" if Intersection over Union >= threshold. The intersection and union are computed over ground truth and submitted bounding box areas.
 - Recall: True positive / (true positive + false negative)
 - Mean Average Precision























Auto Rickshaw Detection Dataset

- Complex Dataset
 - Autos don't have a fixed shape and color
 - Autos without a top
 - Patterned autos etc
- Multiple autos in single image
- Scale issues
- Lots of Occlusion





Annotation Tool : LabelMe

http://labelme.csail.mit.edu

Allows bounding box as well as polygon annotations

Browser Based.







Auto Rickshaw Detection Challenge : Results

Team	Threshold = 0.5		Threshold=0.7		Threshold=0.8	
	Mean Precision	Mean Recall	Mean Precision	Mean Recall	Mean Precision	Mean Recall
IIT-M	0.74	0.56	0.6	0.48	0.49	0.39
SSN	0.59	0.37	0.34	0.24	0.16	0.11
SCETEC	0.77	0.53	0.57	0.41	0.42	0.31
СЕТ	0.85	0.66	0.72	0.57	0.57	0.46
Other Subm.						
Utexas	0.83	0.57	0.74	0.51	0.56	0.41