Edge Benchmark
Which edge detector is better?

Image

Canny [1]

gPb [2]
Which edge detector is better?

Ground Truth  
Canny [1]  
gPb [2]
Depends on what we want

• Instruction for generating ground truth: [3]
  • Divide the image into some number of segments, where the segments represent “things” or “parts of things” in the scene. The number of segments is up to you, as it depends on the image. Something between 2 and 30 is likely to be appropriate. It is important that all of the segments have approximately equal importance.

• Edges are the boundaries where “things” or “parts of things” intersect
Precision

- Precision is the fraction of detections that are true positives rather than false positives [3]

Ground Truth  gPb [2]
Recall

- Recall is the fraction of true positives that are detected rather than missed [3]

True Positives

True Positives + False Negative
High threshold

- Precision = 0.9580
- Recall = 0.7441
- F-measure = 0.8376
- High precision
Low threshold

- Precision = 0.6763
- Recall = 0.9539
- F-measure = 0.7915
- High recall
F-measure & PR Curve

- We could plot P-R curve over different threshold
- The edge detector that generates the most top-right curve is the best
- F-measure captures the trade off between P and R:

\[ F = 2 \frac{PR}{(P + R)} \]

PR Curve on BSDS500 [2]
Reference

