Combining Local and Global Cues for Closed Contour Extraction

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1. Overview

Goal: Extract the simple closed contour bounding the salient object in a natural image.

Method: Contour Grouping - Search for the optimal cycle of local oriented primitives (e.g. line segments) forming the boundary.

2. Forming the Association Graph

Goal: Form a sparse graph representation of oriented structure in the image.

3. Extracting Closed Contours

Goal: Extract salient closed contours without self-intersections incorporating both local and global cues.

3.1 Integrating Local and Global Cues in Path Cost

- First-order Markov assumption for combining local cues
- Scale invariance by normalizing by length
- Global cue: color contrast between two sides of path

- Learn a regressor to predict the average distance of pixels on each path from ground truth contours

3.2 Promoting Path Diversity

- Pruning based on predicted error results in similar paths & low diversity
- PCA helps to find the leading representatives of low error path clusters

4. Ranking Closed Contours

Goal: Choose the most salient contours among closed contour hypotheses

A regressor to predict the Contour Mapping error [CM] of closed contour hypotheses based upon global features of the closed contours.

5. Experiments

Test Set: 63 test images from SOD dataset

Evaluation: Contour Mapping Measure ($c_i$) [CM] and Region error ($c_r$)

LG: our new approach

5.1 Quantitative results

5.2 Qualitative results

Best of 20 top contours output by each algorithm

Code available: www.elderlab.yorku.ca/~vida/LG/

References


