Salient Object Detection for RGB-D Image via Saliency Evolution

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Introduction

Salient object detection aims to detect the most attractive objects for human beings in a given image. Advances in depth data acquisition techniques have motivated the research on RGB-D saliency. We propose an RGB-D salient object detection method based on saliency evolution strategy, which is inspired by the mechanism of human visual system.

Challenge

How to manipulate depth data?
- Depth data are always noisy
- Depth cue and color cue may conflict with each other

Method

Contribution

We propose a two-step saliency evolution strategy to ensure the high precision and completeness of the detected salient objects
- It fully explores the potential of color cue and depth cue in the whole procedure of salient object detection

Procedure

- Extended SLIC: combine depth in spatial proximity term
- Color saliency: compute spatial and background prior weighted global color contrast
- Depth saliency: calculate local depth contrast by center-surround difference
- Fusion & refinement: improve the precision of saliency map
- Propagation: share the saliency value of each super-pixel to its similar neighbors

Experiment

Comparisons with different depth data methods:
- For 2D methods: FT, RC, MC, GMR, RBD, BSCA
- For RGB-D methods: DP, SS, SD, ACSD, Ours

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