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.

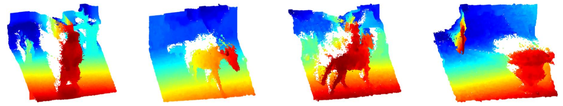
Advances in depth data acquisition techniques have motivated the research on **RGB-D saliency**.

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

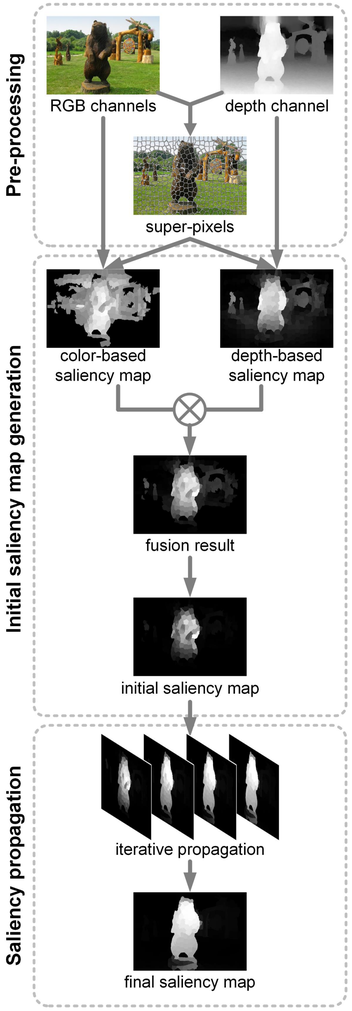
How to manipulate depth data?

- Depth data are always noisy



- Depth cue and color cue may conflict with each other

Method



Contribution

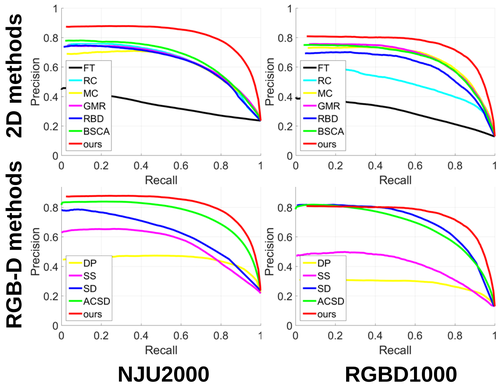
We propose a two-step saliency evolution strategy to ensure the **high precision and completeness** of the detected salient objects

- 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



		NJU2000		RGBD1000	
		F_β^ω	MAE	F_β^ω	MAE
2D methods	FT	0.2009	0.2973	0.1583	0.2175
	RC	0.4025	0.2306	0.1689	0.2856
	MC	0.3749	0.2278	0.3018	0.1735
	GMR	0.4265	0.2174	0.3838	0.1593
	RBD	0.4678	0.1939	0.4300	0.1222
	BSCA	0.4040	0.2270	0.2886	0.1961
RGB-D methods	DP	0.3062	0.2896	0.1654	0.3305
	SS	0.3507	0.2102	0.2323	0.1750
	SD	0.3430	0.2144	0.4647	0.1091
	ACSD	0.4318	0.2031	0.3310	0.1452
	Ours	**0.6009**	**0.1634**	**0.5487**	**0.0974**

* **Red curves** show the performance of our method

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