Twin-Pyramids for Saliency Computation and the Application to Object Proposal Generation

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Motivation

- Saliency, segmentation, and object detection are related concepts in human vision
- We present a joint framework for object proposal generation that is based on saliency and segmentation

Saliency: from iNVT to VOCUS2

- Saliency computation can be simple and fast. The seminal saliency system iNVT by Itti et al. [1] contained all necessary concepts of saliency computation. We show how to adapt Itti's approach to obtain state-of-the-art performance on current benchmarks [2]:
- Fusion: Equal treatment of 3 channels I, RG, BY
- Different opponent color space
- Main change:
- **Twin Pyramids** for Difference-of-Gaussians (one center, one surround pyramid per channel) Enables **flexible center-surround ratio**
- Scale-space with several scales per layer
- Optional: Location prior (e.g. center bias)
- Optional: Segment-based saliency based on object proposal detection method



Itti, Koch, Niebur: A Model of Saliency-based Visual Attention for Rapid Scene Analysis, PAMI 1998
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