Traditional Saliency Reloaded: A Good Old Model in New Shape

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Motivation

- Saliency Computation can be simple, fast, and precise in a coherent system

- The iNVT of Itti et al. (1998) [1] provided all necessary concepts: center-surround contrast, scale-space, feature fusion

- We show how to adapt the iNVT approach to achieve state-of-the-art performance on current benchmarks
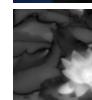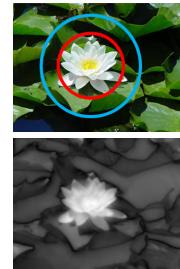
From iNVT to VOCUS2

Compared to iNVT [1], we changed the following:

- Fusion: Equal treatment of 3 channels I, RG, BY

- Opponent color space as in [2]

- **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 generation method

Saliency System VOCUS2

C++ Code at: http://www.iai.uni-bonn.de/~frintrop/vocus2.html

Results

a) Step-wise adaptions from iNVT to VOCUS2

b) Results on Benchmarks

Coffee Machine Sequence
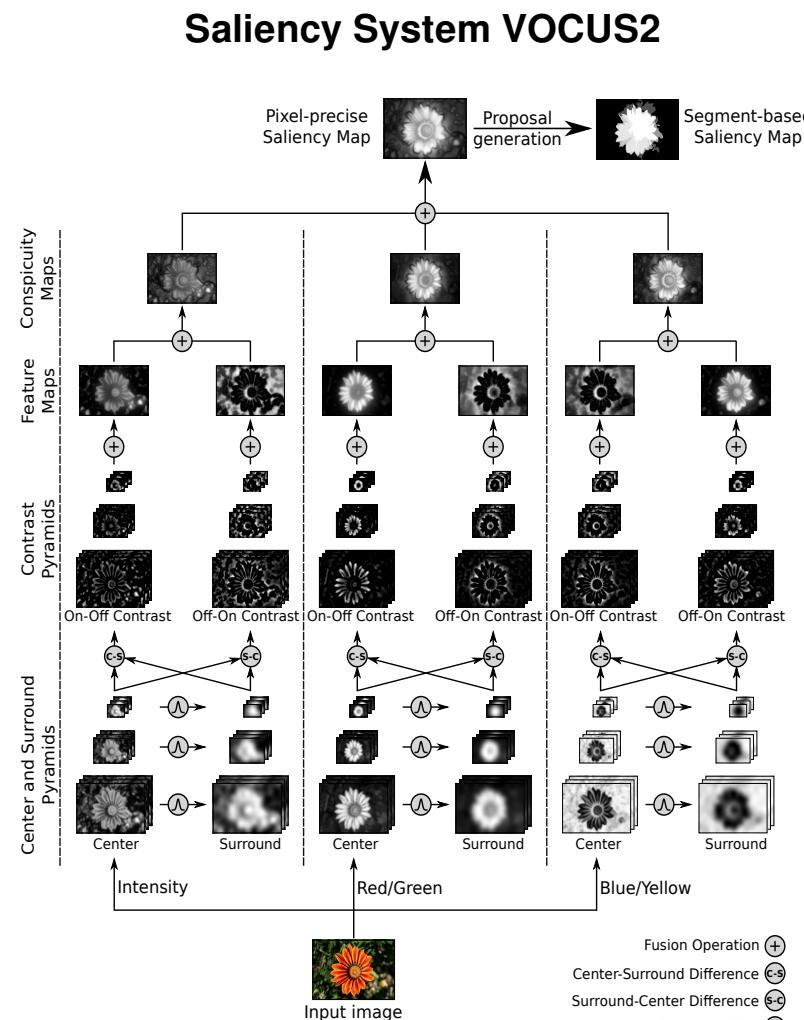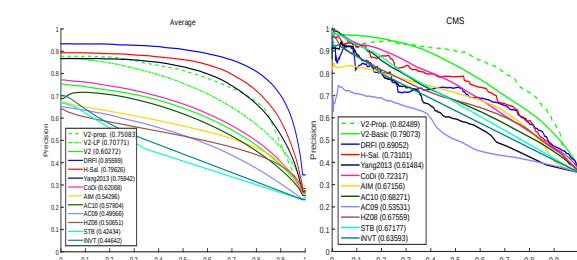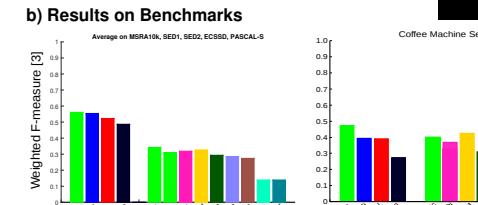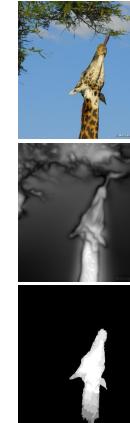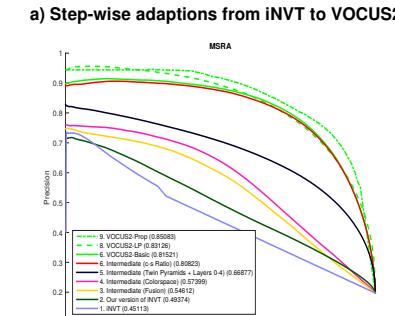
[1] Itti, Koch, Niebur: A Model of Saliency-based Visual Attention for Rapid Scene Analysis, PAMI 1998
[2] Klein and Frintrop: Salient Pattern Detection using W2 on Multivariate Normal Distributions, DAGM-ÖAGM, 2012
[3] Margolin, Zelnik-Manor, Tal: How to Evaluate Foreground Maps? CVPR 2014