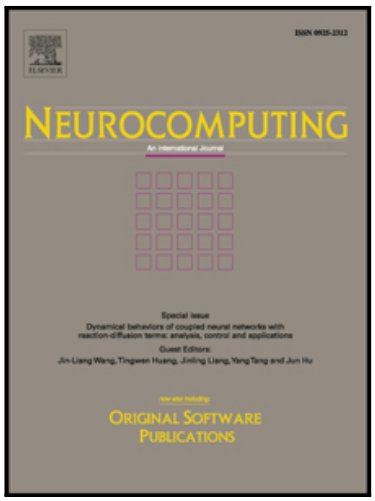

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Diffusion-Based Saliency Detection with Optimal Seed Selection Scheme

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Abstract

To detect salient regions in images, a widely accepted practice is to construct a graph on the image elements, and then assign a saliency value to each node in the graph according to its distance to a number of initial seeds. Two problems emerge in this procedure, i.e. generating the initial seeds and propagating the saliency values. In this work, a scheme for selecting the initial seeds is introduced. A linear model is learned to predict the confidence of assigning a superpixel to the foreground or to the background, and then an adaptive thresholding method is adopted to generate reliable foreground and background seeds, from which the saliency value is propagated in the diffusion procedure. The proposed approach is experimentally evaluated on several saliency detection datasets, and improved results are observed compared with a number of the state of the art methods.

Key words: Saliency detection, seed selection, diffusion

1 Introduction

The purpose of saliency detection is to find regions that humans are most interested in. Saliency detection is motivated by the phenomenon that human repeatedly cast their glimpse on one place of the image and turn to another in a short moment when the image is viewed for the first time. There are two branches in saliency detection, i.e. eye fixation prediction and salient region segmentation. The formal learns a prediction model where human eyes glimpse at when given an image. The latter distinguishes the foreground from the background at pixel level. Saliency detection has a vast area of applications [14,36,39], for example, image retrieval [1,10], image enhancement [2], efficient scene rendering in computer graphics, user eye guidance in virtual reality, etc. In this work, we focus on the salient region segmentation problem.