

A surround-induction function unifying assimilation and contrast in a computational model of colour appearance

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Since the colour perceived from an image point depends on its surround and observing conditions, any visual task computed on a digital image should be performed on the corresponding perceived image. Building perceived colour images requires computation of an image representation in which the effects of induction mechanisms of the human visual system are included in the chromaticity of the image points. Assimilation and contrast mechanisms induce colour changes depending on spatial-frequency properties of images, which depend on the image content in itself and on observer's parameters. These two induction mechanisms can be simulated by a unified computational model based on a wavelet framework. We propose a surround-induction function as a key in the construction of the perceived image. The surround-induction function combined with multiresolution decomposition makes it possible to recover a modified colour image. The parameters of this perceptual function are given by the image content and the observer's conditions. So far we have focused on assimilation and contrast effects but the model possesses interesting properties allowing a general unified approach including other induction mechanisms. The perceived images can be useful for representing colour appearance in digital images for colour assessment or semantic image analysis.