Perceptual atributes of crosstalk in 3-D TV

in the context more predominant by an increase in the duration of its dominance. To investigate the assumption of independence (absence of interaction) of the two processes modulating the dominance and suppression phases in binocular rivalry, we tested the effects of stimulus strength and context in a factorial way in two experiments. As the context, we used moving grating patterns and collinear static Gabor patches in the first and second experiment, respectively. We found that the independence hypothesis in earlier works on dominance and suppression phases was supported only when the level of stimulus contrast was high, giving rise to inconsistent results, ie a significant reduction of suppression duration as the context level went up when the contrast level was low. This aspect of divergence from the independence hypothesis was more salient when a static context stimulus was used.

◆ **Quantitative perceived depth from sequential monocular decamouflage**
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We present a novel stimulus without conventional disparity cues whose perceived depth varies systematically with the relative positions of its vertical edges in the right and left eyes, which were revealed sequentially (delay 80 – 240 ms). A stationary black rectangle was presented in depth either camouflaged against (crossed disparity case), or occluded by (uncrossed) a uniform black field to render it invisible. A small white vertical feature oscillated horizontally at zero disparity (relative to stationary dots which covered the upper and lower sections of the black field), in order to reveal a section of the black rectangle. This corresponds to either the sequential monocular decamouflage of the black rectangle by the occlusion of a white vertical bar disappearing behind the black rectangle (crossed), or the disocclusion of the black rectangle, appearing on a white background seen through a vertical aperture (uncrossed). Subjects set the depth of a probe to the perceived depth of the black rectangle. Settings showed a significant monotonic increase as a function of disparity for crossed stimuli ($p < 0.01$). However, for uncrossed stimuli, few subjects perceived a distant object partially visible through an aperture, making erratic settings. We conclude that sequential monocular decamouflage can be an effective stereoscopic cue to depth.

◆ **The influence of eye movements on stereopsis**
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The region of coded stimuli in random-dot stereograms (RDSs) can be shifted only in one part of stereogram (type 1) or in both image parts (type 2). We propose that, if observer actively uses eye movements for stereopsis, then upper cyclopean disparity limits (UCDL) for stimuli type 1 and type 2 will be equal owing to motor fusion (UCDL1 = UCDL2). Otherwise UCDL1 will be twice UCDL2. We tested this assumption on seven observers (five males and two females, aged 24 to 54 years). The measurements were made by a staircase method with unlimited presentation time. The RDSs (12 in × 15 in) with a coded rectangle with uncrossed disparity (3 in × 6 in) were viewed through liquid-crystal shutters from a distance of 80 cm. For six observers UCDL1 was approximately twice UCDL2 (2.06 ± 0.31). For one observer UCDL1 and UCDL2 were approximately equal (0.98 ± 0.12). We conclude that for most observers eye movements do not influence UCDL. But in some cases the motor component of fusion has to be taken into account.

◆ **Perceptual attributes of crosstalk in 3-D TV**
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Crosstalk, the leakage of light between the left and right eye view, is an important issue in (auto)stereoscopic displays. We studied the effect of different crosstalk levels in combination with varying camera-base distances on perceptually relevant attributes such as overall impairment, perceived image distortions (eg double edges, blur), perceived depth, and visual strain. In an experiment, two natural scenes were used, varying in crosstalk (four levels: 0%, 5%, 10%, and 15%) and depth (three different camera-base distances: 0 cm, 4 cm, and 12 cm). We applied the single-stimulus method for subjective testing according to the ITU 500-10 recommendations. Subjects were asked to assess the attributes on a 5-point numerical scale. Perceived depth and visual strain increased with increasing camera-base distance but were unaffected by the different levels of crosstalk. On the other hand, increasing crosstalk level as well as camera-base distance resulted in increased ratings of image distortions and overall impairment. Comparing the results of the two scenes, the perceived image distortions due to crosstalk strongly depend on the scene content. In summary, increasing crosstalk levels affected the overall impairment and perceived image distortions but had no effect on perceived depth and visual strain.