these methods bring the field closer to having fully automated solutions for important challenges for the cinema industry that are currently solved manually or sub-optimally.

T2.04 **The Reverse Pulfrich Effect: Misperception of Motion in Depth.**

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The Pulfrich effect is a well-known stereoscopic illusion, caused by interocular differences in luminance. The neural processing time of the image with lower retinal illuminance suffers a delay, producing an effective disparity which explains the illusion. But the impact of interocular blur differences, present in monovision corrections for presbyopia, has not been reported. The impact of differential blur on motion-in-depth perception was studied in three observers, in a haploscope rig at one-meter distance. Different interocular blur differences were induced with trial lenses: from 0 to +1.5D in one eye, then in the other eye. Onscreen spatial disparities between the LE and the RE images of the moving stimulus were used to induce interocular temporal shifts. Without illusion, a stimulus with zero interocular temporal shift would seem to move in the fronto-parallel plane of the screen. However, with non-zero interocular temporal shifts (in the stimulus or induced by the illusion), the stimulus follows a near-elliptical trajectory of motion in depth. We used a constant stimuli method changing the onscreen disparity/delay to measure the effect, in a 2AFC procedure. The task was to determine whether a bar was moving to the right or to the left when it appears closer. As opposed to the classic Pulfrich effect, where the manipulated eye with reduced signal suffers a delay, we found that the image in the blurrier eye is processed faster: 1.4-3.7ms across subjects. These processing time differences can lead to dramatic misperceptions. For a target at 5m moving at 25 km/h and with 1.5D of differential blur, the perceived distance will be overestimated by 3m. We report a new version of a 100-year-old illusion, producing motion-in-depth misperceptions in presence of interocular blur differences, as in monovision, that could potentially cause public safety issues.

S2.01 **Robust colour constancy in red-green dichromacy.**

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Red-green (R-G) dichromats have a reduced colour discrimination but the impact on their colour constancy remains unclear. Current research estimates illuminant discrimination thresholds for four normal observers and seven R-G dichromats. Spectral reflectance data from two natural scenes of rural and two of urban environments was obtained from an existing database (Foster et al., 2006, J. Opt. Soc. Am. A, 23, 2359). The scenes were presented under simulated daylight illuminants on a calibrated CRT display controlled by a ViSaGe MKII (Cambridge Research Systems). First experiment used two conditions. In the pure correlated colour temperature (CCT) change condition, illuminants varied on their CCT in the range 4012-40231K (steps of 23.3 MK-1) along the daylight locus but their average luminance was constant at 10 cd/m2. In the pure luminance change condition, illuminants varied on their average luminance in the range 6-15 cd/m2 (steps of 1 cd/m2). Thresholds for detecting an illuminant change were estimated with a 2AFC: observers viewed a reference scene illuminated by daylight with a CCT of 6700K and an average luminance of 10 cd/m2; observers then viewed sequentially two versions of the same scene (comparison scenes), one illuminated by either a higher or lower CCT (pure CCT condition) or luminance (pure luminance condition). The observers had simply to identify the comparison scene that looked different from the reference scene. It was found that thresholds estimated for R-G dichromats were marginally higher than for normal trichromats regarding CCT. Second experiment presented a reference scene and a comparison scene with a CCT or average luminance supra-threshold change tailored for each observer. Observers were asked whether or not the change was an intensity change. Normal observers and R-G dichromats did not differ significantly on their accuracy. These data suggest robust colour constancy mechanisms along daylight locus in R-G dichromats.