failure cascade), followed by watching a video with an expert solving the same emergency procedures. Half of the novices saw the video with the expert eye position indicated, and the other half watched the video without eye movements superimposed. Pilots who were given the expert eye movement information performed better subsequently, and specifically incorporated eye movement strategies from the expert in their behavior.

[42T206] A new 3d virtual reality system to assess visual function and to perfom visual theraphy

Jaume Pujol, Juan C. Ondategui-Parra Ondategui-Parra, Rosa Borràs, Mikel Aldaba, Fernando Díaz-Douton, Carlos E. García-Guerra, Meritxell Vilaseca, Carles Otero, Josselin Gautier, Clara Mestre, Marta Salvador
DAVALOR Research Center - Universitat Politècnica de Catalunya

Assessment of visual function in a clinical optometric examination is carried out through a battery of subjective tests. A complete examination is time-consuming leading to patient fatigue and the results can be influenciated by the optometrist. Vision therapy procedures take even longer sessions and are also dependent on subjective patient responses. A new 3D virtual reality system with matching accommodation and convergence planes has been developed (Eye and Vision Analyzer, EVA, DAVALOR, Spain). While the patient plays a short videogame (< 5min), objective and fast measurements of most optometric parameters are obtained. The system generates 3D images on two displays. Vergence is induced through image disparity and accommodation is stimulated using a varifocal optical system. EVA also incorporates a Hartmann-Shack autorefractometer and an eye-tracker. Measurements are repeated until obtaining a high confidence level and patient collaboration is also measured. A clinical validation of the system was performed in a group of 250 patients. Optometric parameters related with refraction (objective and subjective), accommodation (amplitude, accommodative facility) and vergence (cover test, near point of convergence, fusional vergence and vergence facility) were obtained with EVA and compared to conventional clinical procedures. Results showed good correlation and differences obtained were always within clinical tolerance.
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[43T101] Breaking shape-from-shading inference through body form and countershading camouflage

Julie M Harris[1], Olivier Penacchio[1], P. George Lovell[2], Innes Cuthill[3]
[1]School of Psychology and Neuroscience, University of St Andrews; [2]Abertay University; [3]University of Bristol, UK

Humans, and possibly many other animals, use shading as a cue towards object-shape. Countershading, one of the most widely observed colour patterns in animals, can disrupt these cues to identification. This is a shading pattern on the body that compensates for directional illumination: being darker on the side exposed to a higher light intensity (typically, a dark back and a light belly). To function effectively, countershading must be tuned to 3D form, but natural countershaded reflectance patterns have never been measured while taking into account shape. Here we tested whether the countershading pattern on prey animals could be predicted from their shape, a key test for the camouflage as adaptation theory. We measured both reflectance and shape for several species of caterpillar. Shape was measured using an optical 3D scanner, and reflectance extracted by measuring outgoing radiance and calculating reflectance based on local shape. We compared the measured reflectance pattern with that predicted based on the measured geometrical shape and known illumination. We found that reflectance was well predicted by shape for some counter-shaded species. The results suggest that body shape and colour can both evolve to counter shape-from-shading inference.
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[43T102] The role of projective consistency in perceiving 3D shape from motion and contour

Manish Singh, Xiaoli He, Jacob Feldman
Center for Cognitive Science, Rutgers University, NJ

Observers spontaneously perceive 3D structure in motion displays that are projectively consistent with rotation in depth. They can, however, also perceive 3D structure in displays that are projectively inconsistent with a 3D interpretation, such as the “rotating columns” display (Froyen et al., JOV2013; Tanrikulu et al., JOV2016) containing multiple alternating regions. We examined the role of projective consistency in standard SFM displays by manipulating