

APPLIED VISION

P.34: Influence of Anti-Reflection and Anti-Glare Surface Treatments on Legibility and Visual Fatigue of Reflective-Type Displays

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The affect of anti-reflection and anti-glare surface treatments, the radius of curvature, and the ambient illuminance on the legibility of and viewer fatigue from reflective-type displays was studied. The results showed that legibility and visual fatigue mainly depend on the surface treatment and that a better surface treatment can improve legibility and reduce visual fatigue, especially in very-high-ambient illumination. Surface treatments of 0.8% anti-reflection or 44% anti-glare result in the same visual performance.

P.35: Characterizing Laser Speckle and Its Effect on Target Detection

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A power spectral density metric for characterizing laser speckle and predicting its effect on target detection will be examined. To evaluate the metric, the contrast energy thresholds on both a laser-speckle background and backgrounds consisting of randomly modulated pixel luminance (*i.e.*, pixel noise) were measured. It was found that, at the same power spectral density levels, energy thresholds obtained for gratings superimposed on pixel noise were slightly higher than analogous thresholds obtained with laser-speckle noise. Improvements to the laser speckle metric will be outlined.

P.36: Equating Simulated and Real-World Imagery Using a Target-Identification Criterion

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Air-to-ground target identification was used to select simulated target characteristics that resulted in performance similar to that found in a real-world task. For a wide variety of ground target vehicles, it was found that simulated target-identification levels could be matched to any desired real-world level by making visually realistic modifications to target contrast.

P.37: Just-Noticeable Difference of Image Attributes for Natural Images

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To model the relative importance of the image-quality attributes, white level, black level, color saturation, and contour rendering, their just-noticeable differences (JNDs) were determined. The consistency of the JNDs over natural images, having different luminance and chromaticity distributions, were evaluated.

P.38: Comparison of the Odiousness with Various False-Color Motion Blur in LCDs Caused by Various Factors

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The odiousness by various false-color motion blur in LCDs with respect to each factor to generate the blur has been evaluated. For different color-hue blur, the optimal and allowance levels of odiousness can be expressed by the average PBET value.

P.39: Perceptual Tests of the Temporal Response of a Shuttered LCoS Projector

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Perceptual motion blur for an LCoS projector equipped with a mechanical shutter that effectively reduced pixel hold time was studied. Perceptual measures of blur were obtained with a simple moving-line test stimulus. Relatively small decreases in hold time may render LCoS displays suitable for use in many flight-simulator applications.

P.40: A Visual Model of Color Break-Up for Designing Field-Sequential LCDs

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A model to evaluate the color break-up (CBU) of field-sequential-color liquid-crystal displays (FSC-LCDs) had been successfully established. In order to quantify the CBU, a Color Break-Up Angle (CBUA) was proposed as the evaluation index. From the psychophysical experiments, the $CBUA = 0.22^\circ$ was reported as the averaged threshold value for undistinguished color break-up. Consequently, the minimum frame rate could be derived from the model to suppress CBU in the various FSC-LCDs.