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PERCEPTION OF LINE-SEGMENT TEXTURES ((S.N.Richman and G. Sperling)) University of California Irvine, Irvine, CA 92697

Purpose: How is global information regarding the distribution of texture elements processed by humans? Chubb et al. investigated the distribution of texture elements that consisted of luminance patches. They varied the mean, variance, and higher moments of the distributions of these luminance patches and measured sensitivities to changes in those moments. In our experiments, texture elements consist of randomly oriented line segments of varying length. We manipulate the distributions of the lengths in two ways: We vary mean and variance while holding the probability of outlying events fixed, and we vary the probability of outlying events while holding mean and variance fixed. **Methods:** Each stimulus comprised two textures of randomly oriented line segments of varying lengths. The textures were separated by an invisible horizontal or vertical boundary. Subjects' task was to identify whether the boundary was vertical or horizontal. The stimulus was presented for 500ms and subtended a visual angle of 18 degrees. The textures were chosen from a family of distributions (convex sums of truncated exponentials) which allowed us to vary mean and/or variance and outliers independently. Subjects were unaware of the distribution of lengths prior to presentation. **Results:** Subjects are sensitive to changes in both mean and variance and changes in outlying events, but subjects are significantly more sensitive ($p = 0.5$) to changes in outlying events according to two natural metrics on the distribution of lengths (L_2 and L_∞). **Conclusions:** Subjects' greater sensitivity to outlying events than to mean or variance, even when they are unaware of the distribution of line lengths prior to presentation, suggests that humans may use an active, nonlinear filter to detect and make use of outliers in addition to passive filters which compute mean and variance. C. Chubb, J. Econopouly, M.S. Landy (1994). *JOSA*, **vii**, **n9** 2350-2382

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