**Text S1. Curve fitting for Figure 2.**

All the model-fitting procedures were implemented in Matlab using a non-linear least-square method and weighted by the standard error of each datum. The goodness-of-fit was evaluated by the *r2* statistic:



(A1)

An *F*-test for nested models (Hays, 1994) was used to statistically compare the models. For two nested models with *kfull* and *kreduced* parameters, the *F* statistic is defined as:

,

(A2)

Where, and; *N* is the number of data points.

The average optimum carrier luminance spatial frequency versus modulator disparity spatial frequency curve (Figure 2) is fit by a bilinear function and statistically compared with a linear fit.

The bilinear fit assumes that the average optimum luminance spatial frequency (meanOLSF) remains consistent at low disparity spatial frequencies and linearly increases after one specific disparity spatial frequency (*Dsf*). Thus, there are 2 free parameters, the intercept of the plateau part (i.e., ‘*b*’) and the slope of the linear part (i.e., ‘*a*’). The turning point is defined as the ratio of the intercept to the slope.



(A3)

For the linear fitting procedure, there was only one free parameter, namely the slope ‘a’. The intercept was assumed to be 0.



(A4)

The results of statistical analysis are presented in Table A1, which indicate that the full model is significantly better (*P*=0.013) than the reduced model. Thus, we chose the bilinear fit.

Table S1. Statistical analysis for fittings of the average optimum carrier luminance spatial frequency versus modulator disparity spatial frequency curve.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***df1*** | ***df2*** | ***r2full*** | ***r2reduced*** | ***F*** | ***P*** |
| 1 | 4 | 0.936 | 0.646 | 18.006 | 0.013 |