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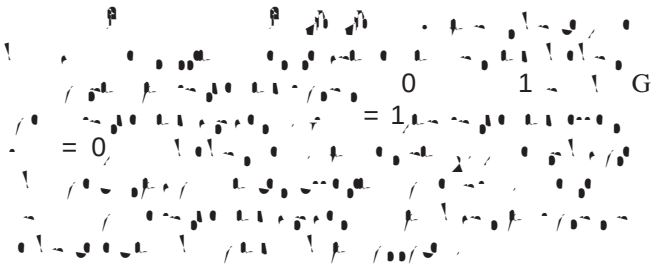
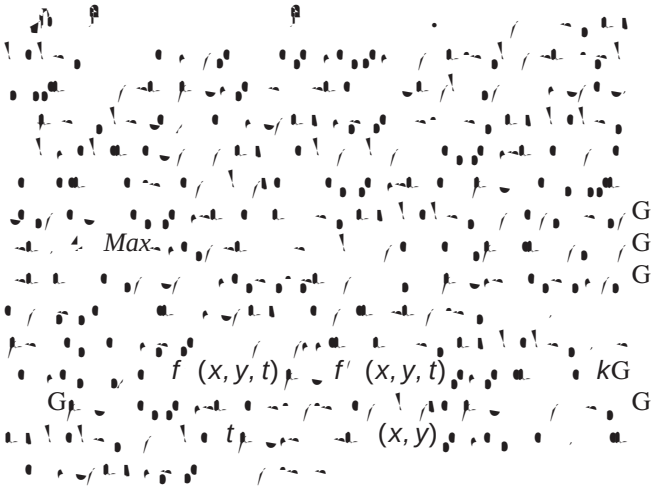
Human saccade is a dynamic process of information pursuit. Based on the principle of information maximization, we propose a computational model to simulate human saccadic scanpaths on natural images. The model integrates three related factors as driven forces to guide eye movements sequentially — reference sensory responses, fovea-periphery resolution discrepancy, and visual working memory. For each eye movement, we compute three multi-band filter response maps as a coherent representation for the three factors. The three filter response maps are combined into multi-band residual filter response maps, on which we compute residual perceptual information (RPI) at each location. The RPI map is a dynamic saliency map varying along with eye movements. The next fixation is selected as the location with the maximal RPI value. On a natural image dataset, we compare the saccadic scanpaths generated by the proposed model and several other visual saliency-based models against human eye movement data. Experimental results demonstrate that the proposed model achieves the best prediction accuracy on both static fixation locations and dynamic scanpaths.

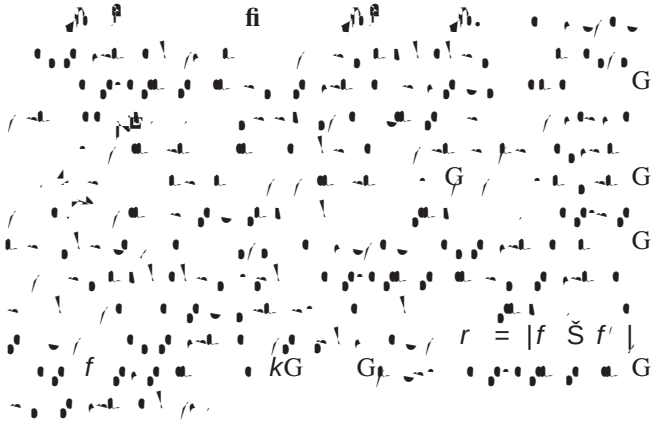
[illegible]

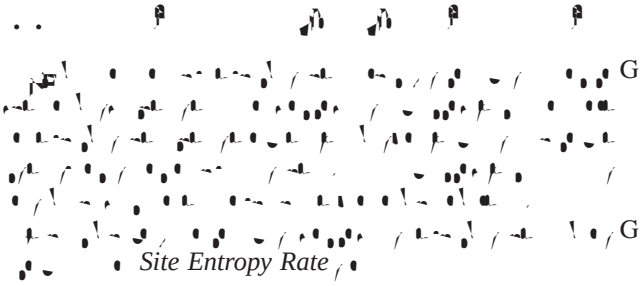
[illegible]

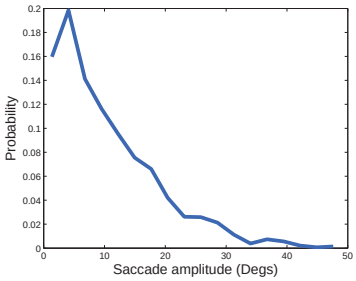




$f'(x,y,t) \quad \max(f(x,y,t), \cdot f'(x,y,t \check{S}\ 1)).$



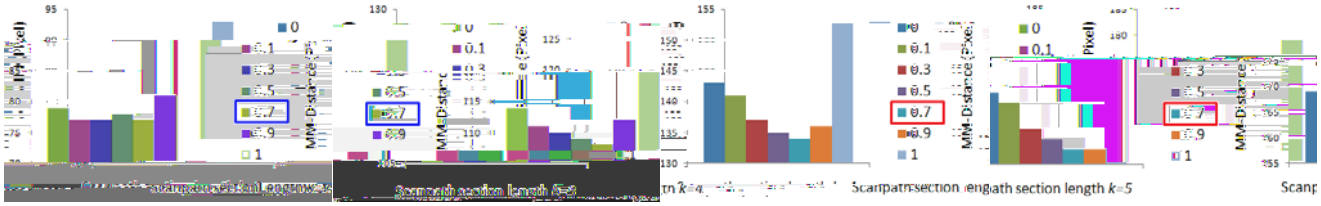



Probability
Saccade amplitude (Degs)
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0
10
20
30
40
50

k

time-delay embedding

k $C(t) = (c(t), \cdots c(t + k - 1))$ k t m t k $X = \{C(t)\}$ R $Y = \{C_h(\tau)\}$ k $k = 2$ X Y R k $x = C(t)$ X



edit distance G

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