

## **A model for search and detection of small targets**

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### **Abstract**

Computational models predicting the distribution of the time to detection of small targets on a display are being developed to improve workstation designs. Search models usually contain bottom-up processes, such as a saliency map, and top-down processes, such as *a priori* distributions over the possible locations to be searched. A situation that needs neither of these features is the search for a very small target near the horizon when the sky and the ocean are clear. Our models for this situation have incorporated a saccade-distance penalty and inhibition-of-return with a temporal decay. For very small, but high contrast targets, using the simple detection model that the target is detected if it is foveated is sufficient. For low contrast signals, a standard observer detection model with masking by the horizon edge is required. Accurate models of the the search and detection process without significant expectations or stimulus attractors should make it easier to estimate the way in which the expectations and attractors are combined when they are included.

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