

Modeling the Neural Circuitry Underlying the Behavioral and Eeg Correlates of Attentional Capture.

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Presentation Abstract Summary One of the most challenging aspects of perception for any agent is the decision of what to attend. What makes information “important” is often thought to be a combination of goal-defined top-down control (e.g. searching for the exit sign while driving down the highway), and stimulus driven bottom-up salience (e.g. a deer suddenly appearing in front of your car). Mediating between these two competing requirements is a major challenge that the brain meets by allowing stimuli to compete for the control of attention. We present a model of this competition that allows information to be either enhanced or suppressed depending on the outcome of the competition.

This Reactive-Convergent Gradient Field (R-CGF) model is a unique approach to modeling spatial attention in that it links neural mechanisms to EEG data. This model was developed with the aim of explaining different, sometimes conflicting, findings in the attention literature, such as whether attention is serial or parallel, and the spatial distribution of suppression. By fitting a large number of behavioral and neural correlates of attention, the R-CGF offers useful insight into a general solution to the stimulus competition problem.

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