

1

Perception and Attention

1. Why does primary visual cortex encode oriented bars of light?
Correlational learning based on natural visual scenes.
2. How do we recognize objects (across locations, sizes, rotations with wildly different retinal images)? *Transformations: increasingly complex featural encodings, increasing levels of spatial invariance; Distributed representations.*
3. Why is visual system split into what/where pathways?
Transformations: emphasizing and collapsing across different distinctions
4. Why does parietal damage cause attention problems (neglect)?

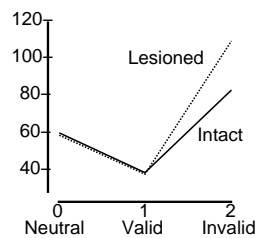
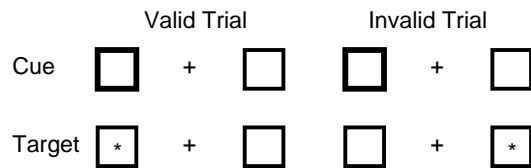
2

Spatial Attention

1. Posner Spatial Cuing Task.
2. Basic Model.
3. Larger-scale Model.

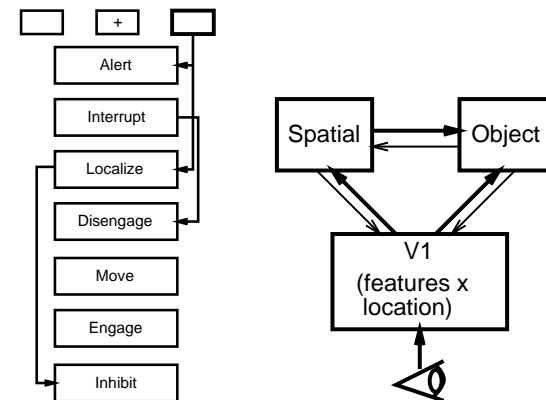
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Posner Spatial Cuing Task



4

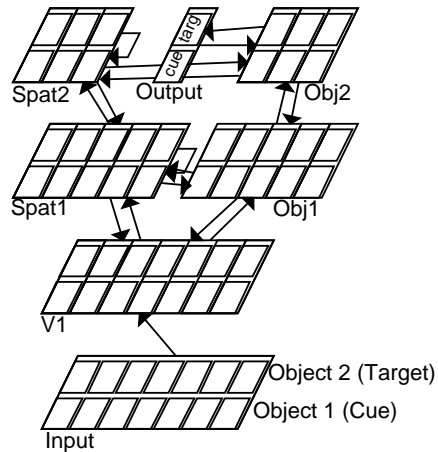
Possible Models



Attention emerges from bidirectional constraint satisfaction & inhibitory competition.

5

Basic Model



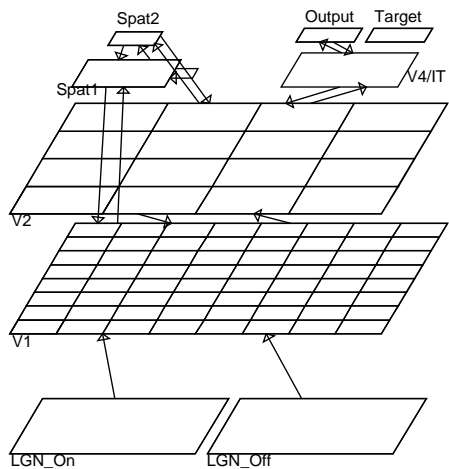
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Posner Task Data

	Valid	Invalid	Diff
Adult Normal	350	390	40
Elderly Normal	540	600	60
Patients	640	760	120
Elderly normalized (*.65)	350	390	40
Patients normalized (*.55)	350	418	68

7

Complex Model



8

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4. Why does parietal damage cause attention problems (neglect)?
Attention as an emergent property of competition