

Attention-driven Scene Analysis

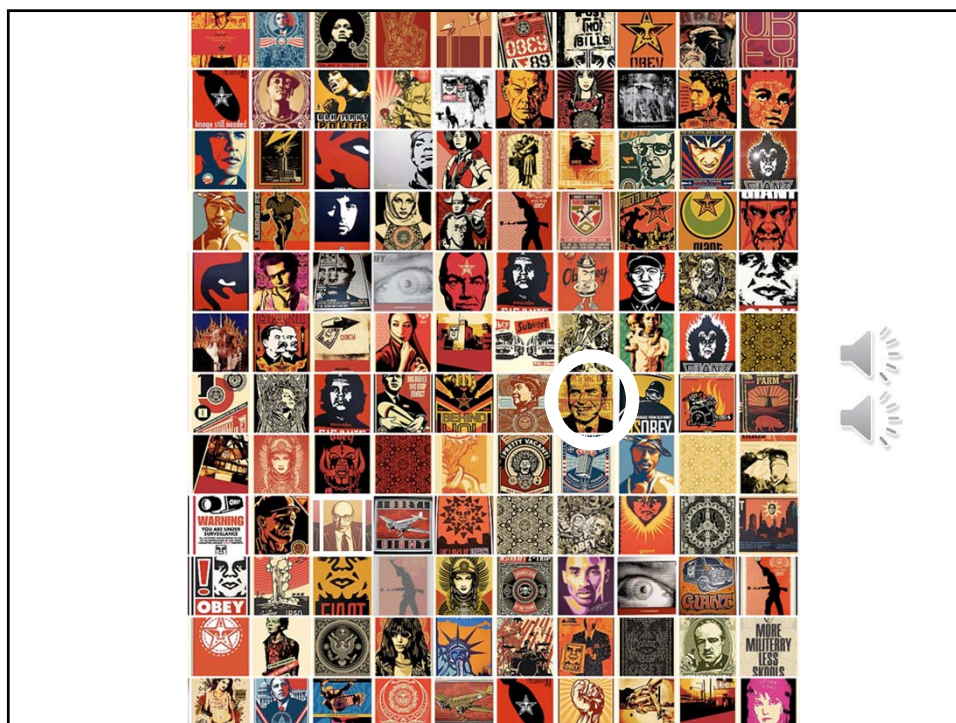
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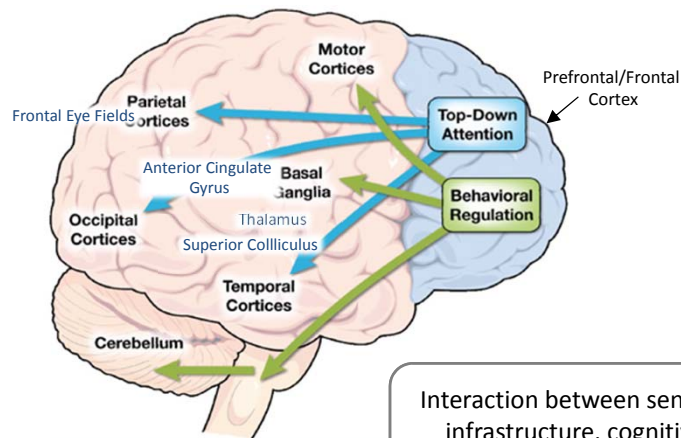
“Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence.”

William James (1890) *“Principles of Psychology”*



Attention is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things


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Interaction between sensory infrastructure, cognitive control, working memory, etc..

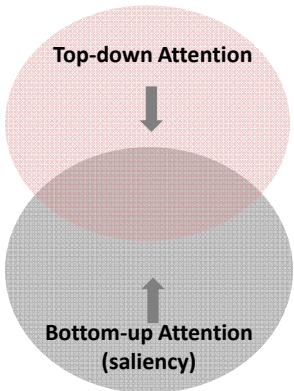
Arnsten AFT, Berridge CW, McCracken JT. *Primary Psychiat*

Attention-Driven Scene Analysis




Research Questions

- ✓ Theories of attention
- ✓ Interaction between bottom-up & top-down attention
- ✓ Neural underpinnings of attention
- ✓ Role of attention in scene analysis
- ✓ From abstract instructions to neural commands



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Proposed Tasks

1. Extend divisive normalization model to work on real scenes
2. Extend divisive normalization model to auditory modality
3. Similarities/Difference among models of visual attention
4. Does visual and auditory attention operate the same way?
5. Test attention model with features from silicon retina
6. Discussion of saliency benchmarks for auditory modality
7. Multi-object attention
8. Saliency and brain waves
9. Attention during smooth pursuit eye movements
10. Compare Auditory Saliency Models
11. Build Eye Tracker

