

9.35 Spring 2024 – practice questions for Final Exam

These practice questions that are shorter than what we will feature on the final exam, and only cover the topics from lectures after the last midterm.

What is the difference between simple and complex cells? How can complex cell responses be described mathematically? Describe one respect in which texture synthesis has clarified whether the standard characterization of complex cells can account for the perception of texture.

Describe the cueing paradigm used to study visual attention. What is measured in a cueing experiment to provide evidence for effects of attention? Describe the difference between exogenous and endogenous attentional cues, and one piece of evidence that they elicit at least partially distinct attentional mechanisms.

Describe evidence for and against the spotlight metaphor for attention.

Draw a graph plotting reaction time vs. set size for a “feature” search in which the target “pops out”, and for a “conjunction” search in which search shows signs of being a serial process. Explain how these graphs relate to feature integration theory.

Explain the conditions in which illusory conjunctions occur, and what they suggest about attention.

Describe experimental evidence that attention alters the spatial resolution of visual processing.

What effect does paying attention to something have on apparent contrast, and duration?

Under what conditions does the attentional blink occur?

Give an explanation for why we don't typically experience change blindness in everyday life.

In a dichotic listening experiment, what does a participant typically recall about the unattended stream?

Describe the four main types of mechanoreceptors, and how they differ in stimulus selectivity.

How does the density of mechanoreceptors vary across the body, and what is the perceptual consequence of this variation in density?

Describe the two neural codes by which information about texture is conveyed by the sense of touch.

Describe the receptors that encode a) temperature and b) pain.

What is the somatosensory analogue to the cortical magnification found in the visual system?

What is one novel feature of somatosensory tuning found in the cortex but not in the periphery?

Discuss the differences between how olfactory receptors and photoreceptors encode information (spatial resolution; temporal resolution; dimensionality).

Describe the general structure of the olfactory system (involving the receptors, olfactory sensory neurons, glomeruli, olfactory bulb, and cortex).

Describe the two main theories for how olfactory receptors work, and some evidence that supports one theory or the other.

The olfactory system adapts to the presence of odorants that are persistent in the environment. Describe evidence for both peripheral and central contributions to this adaptation.

Describe the basis for the transduction of taste signals for salty and sour.

Describe the basis for the transduction of taste signals for bitter and sweet. What is one difference between the receptors for bitter and those for sweet?

How does olfaction interact with gustation to yield flavor?

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