

Lecture 3

Definition relative entropy and examples

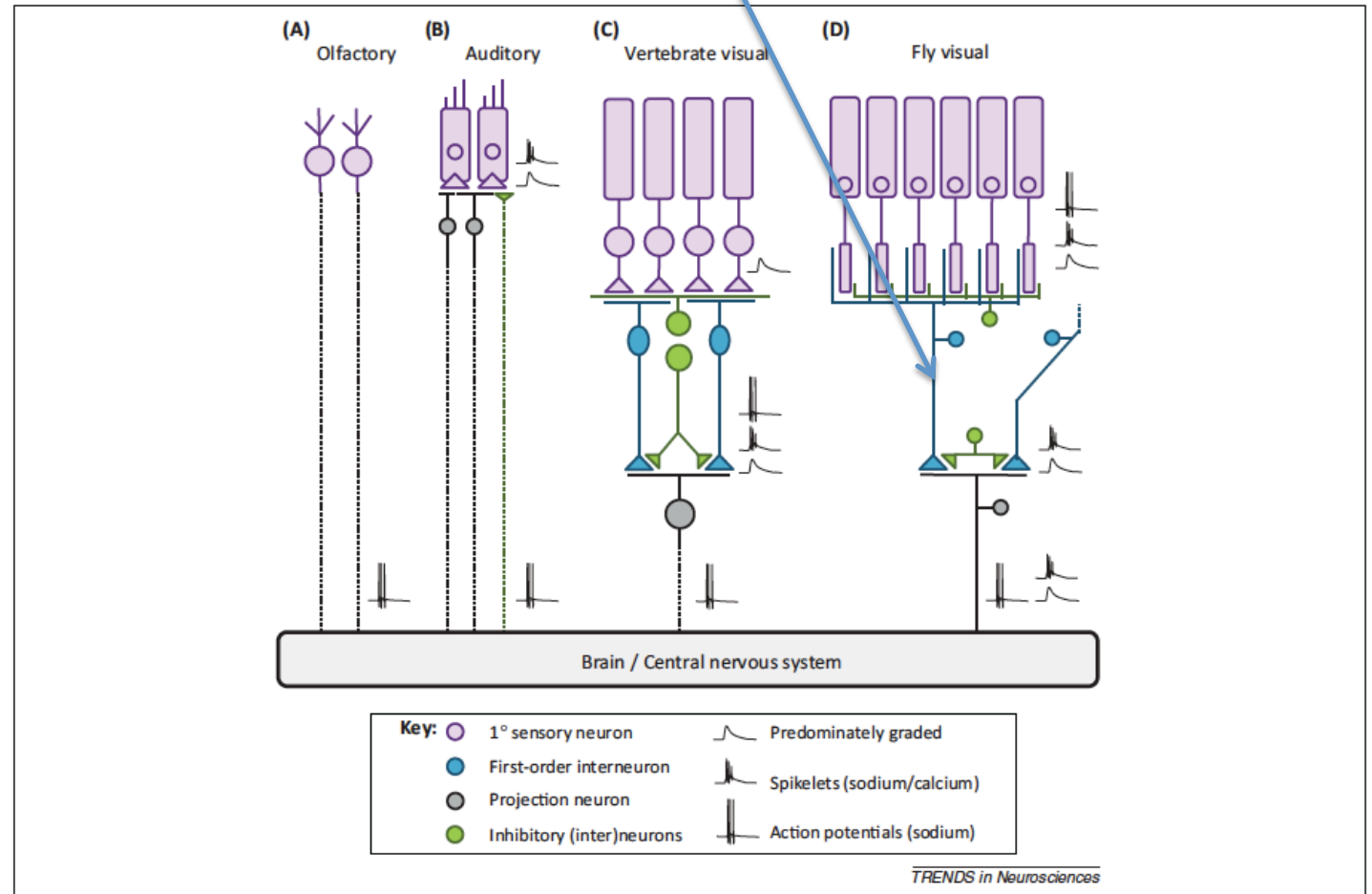
Definition mutual information and examples

Material for both can be found in Cover and Thomas' book
Chapter 2

Following slides and Laughlin's work



Large Monopolar Cells of the blowfly visual system



A Simple Coding Procedure Enhances a Neuron's Information Capacity

Simon Laughlin

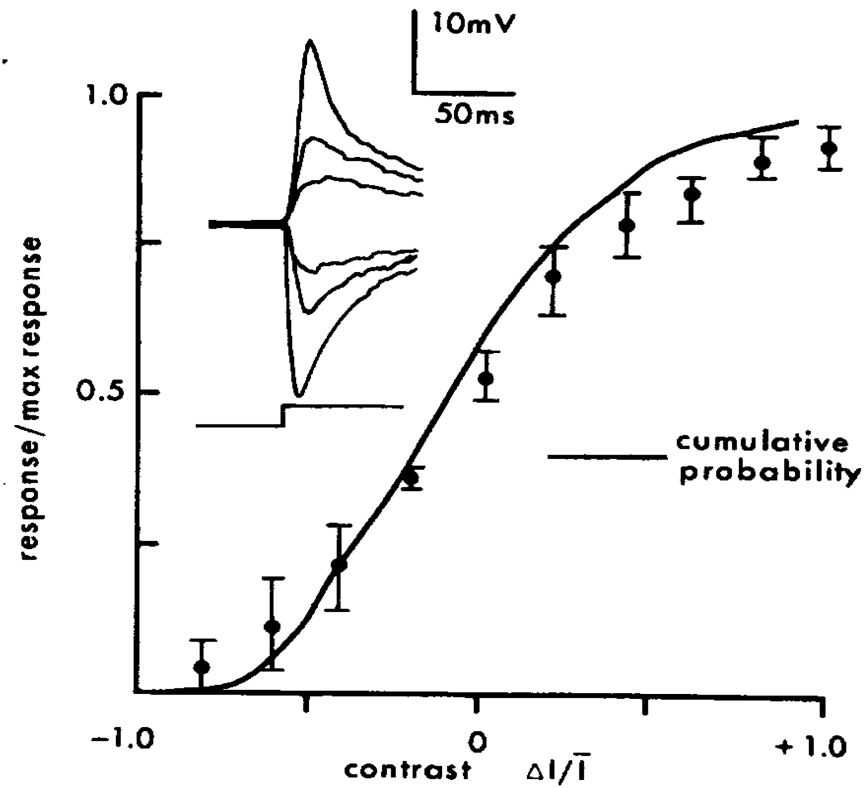
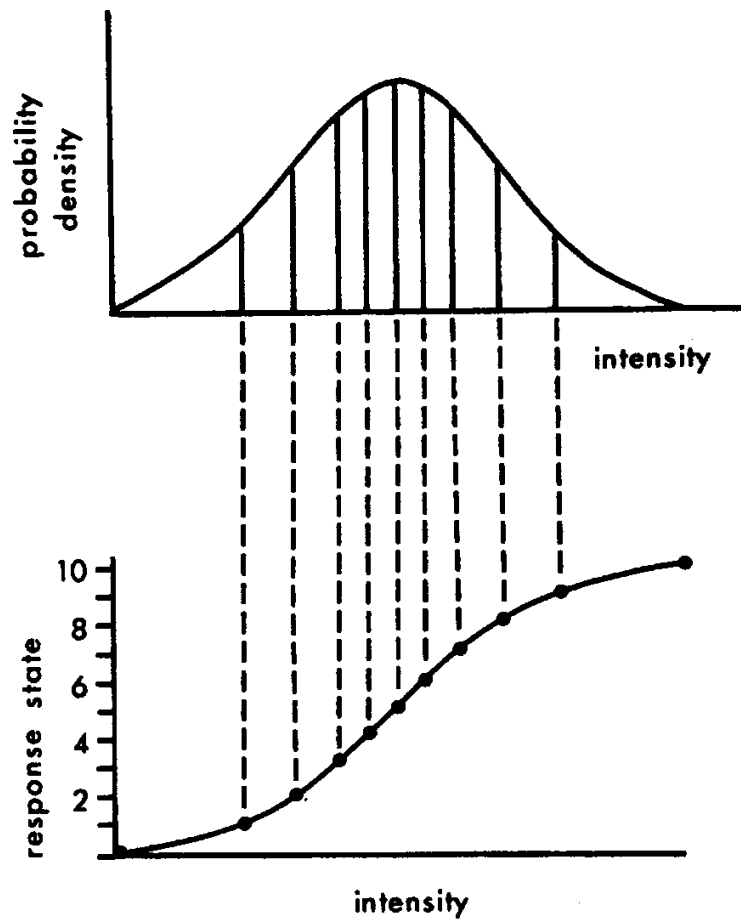
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**Z. Naturforsch. 36 c, 910–912 (1981);
received June 22, 1981**

Neural Coding, Contrast, Fly Eye, Information Theory

The contrast-response function of a class of first order interneurons in the fly's compound eye approximates to the cumulative probability distribution of contrast levels in natural scenes. Elementary information theory shows that this matching enables the neurons to encode contrast fluctuations most efficiently.

Information transmission in blowfly LMC



Prediction by
Max I (contrast input signal, firing rate output signal)