1 Chapter 5 Cue Combination and Evidence Accumulation

Problem Problem 5.2 True or false?Explain.
(a) In the cue combination model of this chapter, the measurements are assumed to be independent of each other.
(b) Conflicts between two measurements generated by a single source rarely occur in real- world perception.

(a) **False.** In the cue combination model, the measurements are assumed to be *conditionally independent* given the stimulus. That is,

$$p(x_1, x_2 \mid s) = p(x_1 \mid s) \cdot p(x_2 \mid s)$$

This does **not** imply that the measurements are independent in general. It only means that once the true stimulus s is known, the cues do not provide additional information about each other. This assumption allows the posterior to be computed by multiplying the individual likelihoods from each cue.

(b) **False.** In real-world perception, conflicts between measurements from a single source are common. For example, visual and auditory cues may conflict due to noise or environmental distortion. Bayesian models account for this by weighting cues based on their reliability. Therefore, it is incorrect to say such conflicts "rarely occur".