1 Chapter 7 Discrimination and Detection

Problem 7.4 ***We formulated the decision rule as reporting one alternative*** $d > 0$ ***and the other when*** $d < 0$***. Why does the case*** $d(x) = 0$ ***usually not have to be considered? What would the observer do when*** $d(x) = 0$***?***

When $d(x) = 0$, it means that the decision variable provides no preference between the two alternatives, which means that it indicates perfect balance in evidence.

But however, this scenario would be very rare. Since $d(x)$ is a continuous function of measurement x, and the probability that $d(x)$ lands exactly at zero is effectively zero. Thus, this boundary condition has measure zero and doesn't affect the overall decision strategy.

However, if $d(x) = 0$ really happens, then the observer can not really use any criterion to decide. So they may thus:

- **Random choice:** Choose between the two alternatives with equal probability.
- **Tailed decision-making:** Always favor one alternative when indifferent (e.g., always choose s_+).