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Noise as a strategy

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Animals use olfactory cues while navigating their environments to find food, locate mates and avoid danger. Previously, we studied the dynamics of the bilateral model, a strategy that depends on the simultaneous comparison between odor concentrations detected by left and right sensors. We showed that the agent has to be in an attraction region around the odor source in order to navigate towards the point source or follow the trail, else it fails. Thus, to improve the probability of finding the odor source, we employ a search strategy by adding noise to the heading angle in the bilateral model. We find that constant noise will be more successful when paired with a nonlinearity applied either to the concentration detected by the left and right sensors or to the difference in concentrations. We also show that concentration dependent noise improves performance.