

# Bayesian Model of Goal Direction Inference in Animacy Perception from Moving Dots

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## Abstract

The phenomenon of perceiving lifelikeness in the movements of non-living objects is referred to as animacy perception. This study hypothesized that when humans infer intentionality from motion information, they initially estimate the direction of the goal of the movement in a Bayesian manner. The magnitude of change in this estimated direction reflects the strength of intentionality and self-propelledness, which are correlated with the perceived strength of animacy. We tested this hypothesis through an experiment in which participants evaluated animacy, intentionality, and self-propelledness for dots moving on a screen. The results revealed that although the magnitude of motion direction changes did not directly influence intentionality and self-propelledness, both the magnitude of goal direction changes and variance had a significant impact. These findings suggest that animacy perception may be realized through hierarchical Bayesian estimation.