

And The Truth Shall Make You Extinct:

Perception, Evolution and Quantum Measurement

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Is perception, in general, veridical? Yes, say most vision experts, and credit evolution: Natural selection favors true perceptions and, in consequence, shapes us to see the truth that we need. Thus, on this view, perception is a process of estimating truth, and Bayesian estimation aptly models this process. This view, however, has a problem: Fitness and truth are distinct; natural selection depends on fitness. I present theoretical evidence from evolutionary games and genetic algorithms that true perceptions need not be fit, and are driven to extinction routinely by non-veridical perceptions that are tuned to fitness. I present empirical evidence, such as supernormal stimuli, that non-veridical perceptions are in fact ubiquitous in biological sensory systems. I propose that perception should be viewed not as a window on truth but as windows on PCs: A windows desktop guides useful interactions with a complex world of diodes, resistors and voltages that it in no way resembles. I present a mathematical formulation of this proposal, and describe how it comports well with quantum Bayesianism. Perhaps quantum measurement strikes us as odd not because it contradicts our daily perceptions, but because we assume, incorrectly, that such perceptions report truth rather than fitness. Background paper:

<http://www.cogsci.uci.edu/~ddhoff/HoffmanSinghMarr.pdf>