

The Inside Story on Systems, Minds and Mechanisms

John L. Casti

Do the laws governing a system differ when you're inside the system from those you see when you look at the system from the outside? This is the central question of what's come to be termed "endophysics." Here we examine this question for the case when the system is the human mind. More specifically, we consider the problem of "strong" AI, which asks if a computing machine can duplicate the cognitive capacity of the human mind -at least, in principle. Looked at from the outside, this question reduces to the familiar Turing test for a thinking machine. But from the endophysics point of view, the matter becomes far more problematical, leading to some of the strongest critiques against strong AI. Following consideration of the strong AI problem, the paper concludes with a discussion of the issue of a system observing itself. Endophysically speaking, this situation leads immediately to all the familiar problems associated with self-reference, tangled loops and paradox, both logical and geometric. Our final conclusion is that the only way to break out of these loops is to think endophysically, which means explicitly recognizing that, in general, the laws of nature do look different when you stand inside the system than when you're looking at it from the outside.