Computing the Uncomputable, or, The Discrete Charm of Second-Order Simulacra

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Abstract

We study an especially attenuated application of " mediating models", in which computer simulations suggest that a certain dynamical system exhibits non-computable behaviour. These simulations are defended by reference to a simpler model of the model (hence " second-order simulacra"). We will see that this defence is problematic, but there are general reasons to believe the simulations are accurate. And though these models do not prove anything specific about an actual physical system, they influence our general expectations, and provide an essential component for any complete explanation of why and how the qualitative behaviour of some actual systems may be non-computable.

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