Inverse Ontomimetic Simulation: a window on complex systems

Andersson, Claes (2009) *Inverse Ontomimetic Simulation: a window on complex systems.* In: [2010] Models and Simulations 4 (Toronto, Ontario; May 7-9, 2010).

Abstract

The present paper introduces "ontomimetic simulation" and argues that this class of models has enabled the investigation of hypotheses about complex systems in new ways that have epistemological relevance. Ontomimetic simulation can be differentiated from other types of modeling by its reliance on causal similarity in addition to representation. Phenomena are modeled not directly but via mimesis of the ontology (i.e. the "underlying physics", microlevel etc.) of systems and a subsequent animation of the resulting model ontology as a dynamical system. While the ontology is clearly used for computing system states, what is epistemologically important is that it is viewed as a hypothesis about the makeup of the studied system. This type of simulation, where model ontologies are used as hypotheses, is here called inverse ontomimetic simulation since it reverses the typical informational path from the target to the model system. It links experimental and analytical techniques in being explicitly dynamical while at the same time capable of abstraction. Inverse ontomimetic simulation is argued to have a great impact on science and to be the tool for hypothesis-testing that has made systematic theory development for complex systems possible.

Item Type:	Conference or Workshop Item (UNSPECIFIED)
Keywords:	Simulation, complex systems, epistemology
Subjects:	Specific Sciences > Complex Systems General Issues > Models and Idealization
Conferences and Volumes:	[2010] Models and Simulations 4 (Toronto, Ontario; May 7-9, 2010)
Depositing User:	Claes Andersson
Date Deposited:	07 Apr 2010
Last Modified:	07 Oct 2010 11:19
Item ID:	5304
URI:	http://philsci-archive.pitt.edu/id/eprint/5304

Actions (login required)