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Physics : Data-driven Science, Modeling and Theory Building

Berea, Anamaria

Emergence of Communication in Socio- Biological Networks

- Adapts methods and insights from the social sciences and economics into biology
- Contains the latest advances in mathematical linguistics through agent-based modeling of subjective signals and responses
- Includes mathematical models and code for agent-based models to explore various scenarios of language evolution

This book integrates current advances in biology, economics of information and linguistics research through applications using agent-based modeling and social network analysis to develop scenarios of communication and language emergence in the social aspects of biological communications. The book presents a model of communication emergence that can be applied both to human and non-human living organism networks. The model is based on economic concepts and individual behavior fundamental for the study of trust and reputation networks in social science, particularly in economics; it is also based on the theory of the emergence of norms and historical path dependence that has been influential in institutional economics. Also included are mathematical models and code for agent-based models to explore various scenarios of language evolution, as well as a computer application that explores language and communication in biological versus social organisms, and the emergence of various meanings and grammars in human networks. Emergence of Communication in Socio-Biological Networks offers both a completely novel approach to communication emergence and language evolution and provides a path for the reader to explore various scenarios of language and communication that are not constrained to the human networks alone.

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