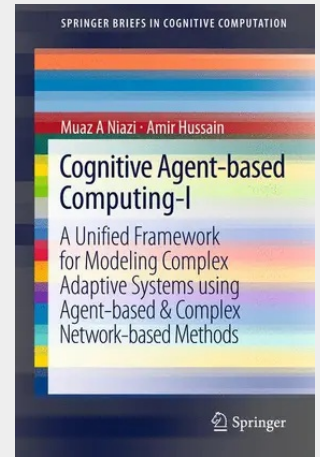


Cognitive Agent-based Computing-I

A Unified Framework for Modeling Complex Adaptive Systems using Agent-based & Complex Network-based Methods

Complex Systems are made up of numerous interacting sub-components. Non-linear interactions of these components or agents give rise to emergent behavior observable at the global scale. Agent-based modeling and simulation is a proven paradigm which has previously been used for effective computational modeling of complex systems in various domains. Because of its popular use across different scientific domains, research in agent-based modeling has primarily been vertical in nature. The goal of this manuscript is to provide a single hands-on guide to developing cognitive agent-based models for the exploration of emergence across various types of complex systems. We present practical ideas and examples for researchers and practitioners for the building of agent-based models using a horizontal approach - applications are demonstrated in a number of exciting domains as diverse as wireless sensors networks, peer-to-peer networks, complex social systems, research networks, epidemiological HIV

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