Multi-Agent Virtual Histories of the Development of Differentiated Economic Strategies

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Agent communications, agent cognition and agent strategy selection play a vital role in the evolution of complex behaviors in multi-agent modeling systems. Complex cognitive agents allow models to develop highly differentiated results and show a wider range of outcomes than models that use overly simplistic agents. The ability for agents to create and communicate solutions are important in understanding how stability and instability can develop in the management of complex interactive problems such as resource allocation and usage. Ultimately, these complex cognitive agents and the virtual histories they create may reveal under what conditions successful resource management strategies emerge and proliferate.

Using a modified version of Holland's Learning Classifier System (LCFS), the smallworld simulation records path dependent histories, called virtual histories, of agents interacting with each other and their local environment. The introduction of agents with increased cognitive ability, communication and memory merge the work of Holland, Epstein and Axtell and Alker and Bennett to reveal how the formation and transmission of ideas can mimic patterns found in the real world.