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A PILOT STUDY ON MODELING AND ANALYSIS OF CAPRICIOUS AGENTS IN AGENT-BASED SIMULATIONS

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Abstract. *In this paper, we deal with an agent-based problem including capricious agents, which show attitudes of either pioneers (reformists) or followers (conservative agents) at random (capriciously). There are many capricious persons in contemporary society, so we express them as capricious agents in agent-based simulations. In order to consider the characters of the capricious agents precisely, we define some types of capricious agents according to the degree of partialness (pioneers or followers). The way in which capricious agents are decided as either pioneers or followers are in a stochastic method. Simulation studies show that the capricious agents are affected by the action rules of agents (pioneers and followers) and that the capricious agents and the partialness of their character (performance rules) can be expressed by using probability.*
Keywords: Agent-based simulations, Categorization of agents, Capricious agents, Partialness of performance rules

1. **Introduction.** Many researchers treat simulation and estimation problems for economic and social activities [1-9]. In the last decade, agent-based simulations problems have been attracting much attention as one method for simulating economic and social phenomena. Especially, the researchers in marketing science need simulation tools for estimating the spread of vogues and rumors. Some scientists perform economic and social researches connected with agent-based simulations [1-4], [7-9]. Agent-based simulation is one analyzing method for various social phenomena. Agents are given initial conditions and some performance rules. The agents are arranged in the virtual space and they act autonomously according to their performance rules.

In order to perform agent-based simulations, at first we define some types of agents according to their characters. In social science, adopter categorization proposed by Rogers [10,11] is known widely. Rogers has been extensively considered in such problems for innovation and communication. In his research, he proposes the adopter categories, in which he categorizes five segments for agents (adopters), they are so complex that it is difficult to analyze and simulate these agents actually. Hence, some researchers employ two types of agent (categorization), pioneers and followers [7-9]. Murata et al. [7] research the effect of the initial arrangements of agents and their attitudes. On the other hand, the author has dealt with some kinds of models described in stochastic processes [12,13]. Furthermore, he introduces stochastic process in agent-based simulations in order to describe actual phenomena [8,9]. In these studies, he deals with two types of effect for agents, local influences and global influences, and the effect of global influence with random elements is analyzed [8,9].