

INFLUENCE OF RUMORS INCLUDING VAGUENESS IN AGENT-BASED SIMULATIONS

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ABSTRACT. *In the past few decades, agent-based simulation has been attracting much attention in various fields, for example economics, marketing science, and so on. We deal with the influences of vagueness included in circulation of rumors by agent-based simulations. It is supposed that the elements in circulation of rumors mainly consist of importance and vagueness in psychology and marketing fields. Rumors including vagueness element are modeled by using local influence in agent-based simulations and agents with vague characters are represented by (randomly) vagueness coefficient. Simulation studies show that the agents with vagueness are affected by the range of vagueness coefficients clearly and that the action results of these agents have some regularity.*

Keywords: Agent-based simulations, Fundamental law of rumors, Vagueness coefficient, Categorization of agents

1. **Introduction.** Simulation and estimation problems for not only engineering but also economic and social activities are treated by many researchers [1-9]. There are many approaches for these problems, agent-based approaches have been concentrating our attention in one method for modeling and analyzing marketing researches as well as researches of social and economic phenomena [1,2,5-8]. Though one of weak points in analyzing by equations is difficulty in identifying optimal parameters according to (real) economic phenomena [9] as well as physical phenomena [10], one of the advantages of agent-based simulations is the unnecessary of setting these precise parameters. In agent-based simulations, if the researchers set agents with some performance rules and a virtual space, agents act autonomously in the virtual space according to their performance rules and then researchers gets simulation results easily.

Some of scientists perform economic and social researches connecting with agent-based simulations [1,2,5-8]. As the researchers in marketing science strongly need simulation tools for estimating the spread of vogues and rumors, the author propose some simulation algorithms by agent-based simulations [1,2]. In marketing science, circulation of rumors has been concentrating much attention of many researchers because many people decide their behaviors by the rumors, for example selections of goods which consumers purchase and choices of a candidate at elections, and researchers want to know these behaviors in advance. About the circulation of rumors, Allport and Postman propose the fundamental law, which the amount of rumors in circulation is proportional to the product of the importance for the rumor and the vagueness of the rumor [11].

In this paper, the effect of vagueness included rumors is modeled and analyzed by using agent-based simulations. Concretely speaking, we introduce this law in agent-based simulations by the concept of probability. Two types of agent, pioneer and follower [1,2,8,12],