From Modeling To Experiments - Simulation in the Context of Agent Environments

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Abstract. Modeling and simulation techniques are valuable tools to analyze the behavior of multi-agent systems. Ten years ago, the focus of interest has been directed towards modeling the environment the agents dwell in, as the effectiveness of an agent or agents to interact with their environment determines to a large degree on the effectiveness of the agent. Due to the agents environment being dynamic, analyzing agents in these environments is often based on simulation techniques, i.e., experiments with the modeled environment and the either modeled or embedded agents. Since then a plethora of modeling approaches has been suggested to describe agents and their environments. Here we will move the focus to the experiments done with agent-based models and, particularly, their environment. To develop and validate the model of the environment diverse experiments are required. Phases of refining and enriching models alternate with experiments that range from simple parameter scans to statistical model checking. Workflows and an explicit description of experiments can support this intricate process and facilitate designing, reusing, and reproducing experiments.