

**SELF-EVOLVING AGENT-BASED SIMULATION PLATFORM FOR PREDICTIVE
ANALYSIS ON SOCIO-ECONOMICS BY USING INCREMENTAL MACHINE LEARNING**

Dong-oh Kang
Jang Won Bae
Chun-Hee Lee
Joonyoung Jung
Euihyun Paik

Smart Data Research Group
Electronics and Telecommunications Research Institute
Daejeon, 34129, REPUBLIC OF KOREA

ABSTRACT

We have developed a self-evolving agent-based simulation platform for predictive analysis of socioeconomic applications. Although continuous model correction is required for reliable prediction whenever new data is added, it is very time-consuming and expensive to repeat the new modeling and calibration tasks of the agent-based socioeconomic simulation applications. We have developed algorithms, software architecture and tools to evolve the agent-based models in an incremental way of data assimilation and automatic model calibration with minimized human intervention via machine learning. We use a changeable component-based structure of agent-based models and the Gaussian optimization technique to derive optimal model configurations from incoming data. Also, we have developed a distributed and parallel simulation engine for large-scale simulation and a web-based GUI tool that manages the simulation and displays results. We will demonstrate the self-evolving process and results of simulation tasks of the Korean housing market and welfare of the elderly with real data.