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A Game-Theory-Based Price-Optimization Algorithm for the Simulation of Markets Using Agent-Based Modelling

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Abstract : A price competition algorithm for ABMs based on game theory principles is proposed to deal with the simulation of theoretical market models. The algorithm is applied to the classical Hotelling's model and to a two-sided market model to show it leads to the optimal behavior predicted by theoretical models. However, when theoretical models fail to predict the equilibrium, the algorithm is capable of reaching a feasible outcome. Results highlight that the algorithm can be implemented in other simulation models to guarantee rational users and endogenous optimal behaviors. Also, it can be applied as a tool of verification given that is theoretically based.

Keywords : agent-based models, algorithmic game theory, multi-sided markets, price optimization
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