Sub-strategy updating evolution in minority game

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In this paper, we propose and study a new evolution model of minority game. Any strategy in minority game can be regarded as composed of sub-strategies corresponding to different histories. Based on the evolution model proposed by Li-Riolo-Savit in which those agents that perform poorly may update their strategies randomly, this paper presents a new evolution model in which poor agents update their strategies by changing only a part of sub-strategy sets with low success rate. Simulation result shows that the new model with sub-strategy-set updating evolution mechanism may approach to its steady state more quickly than Li-Riolo-Savit model. In the steady state of the new model, stronger adaptive cooperation among agents will appear implying that the social resource can be allocated more rationally and utilized more effectively compared to Li-Riolo-Savit model.