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Finding optimal strategies in the Yard-Sale model using neuroevolution techniques

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A new type of in-depth microscopic analysis is presented for the Yard-Sale model, one of the most well known multi-agent market exchange models. This approach led to the classification and study of the individual strategies carried out by the agents undergoing transactions, as given by their risk propensity. These findings allowed to determine a region of parameters for which the strategies are successful, and in particular, the existence of an optimal strategy. To continue exploring this concept, a new approach is then proposed in which rationality is added in the agents behaviour through machine learning techniques. Strategies that maximize the individual wealth of each agent were then found by performing their training through a genetic algorithm. The addition of different levels of rationality given by the amount of available information from their environment showed new and promising results, both at the macroscopic and microscopic level. It was found that the addition of trained agents in these systems leads to an increase in wealth inequality at the collective level.

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