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# Machine Learning and Optimization

## Adaptive menu sizes in P2P platforms



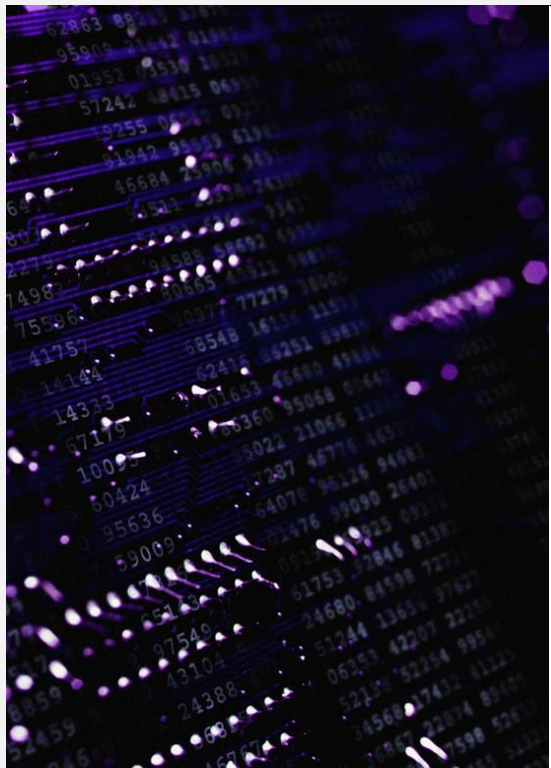
- Multiple agents, multiperiod problem
- Bilevel structure among agents
- Leader learns the agents' utility functions through their preferences
- Leader wants to determine optimal number of options to offer the followers

## Price optimization using customer preferences



Two agents, multiperiod problem  
The buyer wants to determine the prices that would (a) help learn the market structure and (b) maximize the total revenue

## Preference Learning in Multiobjective Optimization



- The weights used to solve MOO are unknown, and are learnt through preferences
- The goal is to determine which choices to offer to the decision maker to accelerate learning process

## SVM with nonnegative coefficients



- Underlying structure in the data already known
- Modifying SVM solution algorithm to guarantee faster convergence to a model with all nonnegative weights