

# On the learning of mechanism design

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## 1 Introduction

Mechanism design is an interesting topic in game theory which aims at designing a game instead of playing it.

Learning is another fundamental field in computer science. It stands for the hope of strong artificial intelligence and has become a powerful technic everywhere for everything.

Using the agents with AI to play games is a very old idea. Nowadays, AI can be found in video games, chess and many other games. Recently learning algorithms have shown their power in general games and outperform human beings in Go. Then it's nature to ask whether machine can be a game designer?

In this paper we answer the question partially by showing that it's possible to learn mechanisms in game.

## 2 Auction

Consider auction.

There are  $n$  participants and one item. Each participant has a valuation of the item.

The common knowledge held by the participants contains two parts:

- Distributions of each participant's valuation.
- The mechanism of the game.