

# Game-Family Learning for Simulation-Based Games

*Game Theory, Mechanism Design*

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# Game-Family Learning, with Application to Mechanism Design

## Setting

- Payoffs come from agent-based simulator
- Challenge: limited query budget

## Motivating Example

Online advertising auctions



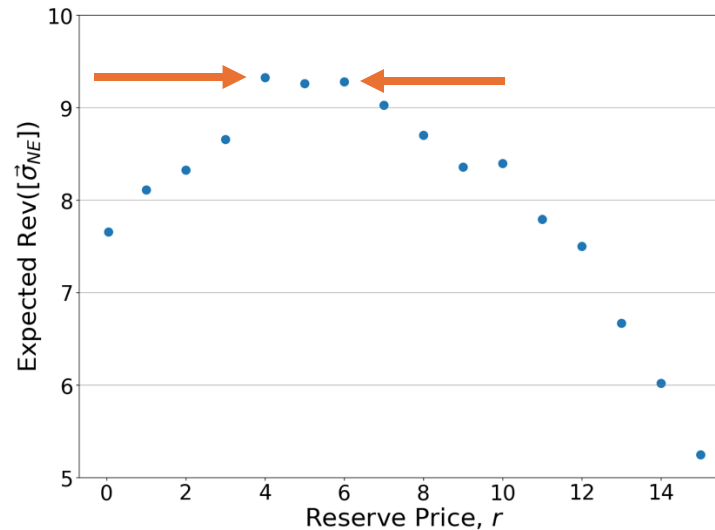
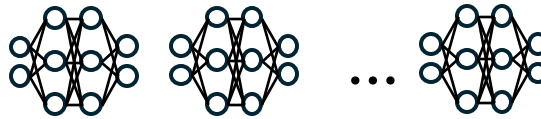
Sponsored Ad

Optimize the **reserve price** to maximize publisher revenue.

## Game-Instance Reasoning

Separate game instances:

$\Gamma(0)$ ;  $\Gamma(1)$ ; ...  $\Gamma(15)$



## Game-Family Reasoning

Parameterized Game Family:

$\mathcal{G}(R) = \{\Gamma(r) : 0 < r \leq 15, r \in \mathbb{R}\}$

