WINE 2021 Poster Session

Eliciting Information with Partial Signals in Repeated Games
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Energy prosumers are charged based on their net consumption of electricity, which is unfair.

The meter can only see "part of" the actual consumption.

We want to incentivize prosumers to report their gross consumption.
Consider a repeated game with $T > 1$ rounds. Let $t = T, T - 1, \ldots, 1$ denote the number of rounds left.

In each round $t$,

- The center observes the agent’s net consumption $y_t \sim F$
- The agent reports her gross consumption, $b_t \geq y_t$
- The agent is charged a regular payment $b_t$ and a penalty payment $r|b_{t+1} - b_t|$ for $t < T$

The agent’s gross consumption is $D$ for each round. We would like to find the minimum $r$ that induces truthfulness.
Main Findings

- Minimum penalty $r$ required for truthfulness decreases as $T$ increases $\Rightarrow$ “Fear of Tomorrow” verification
- Approximate truthfulness for any arbitrary distribution can be obtained by analyzing a Bernoulli distribution.
- Given $r$, we give the optimal strategy for the agent.

![Figure: Optimal strategy for a single agent](example.png)

(a) For $Ber(0.3)$ distribution

(b) For $Ber(0.7)$ distribution

**Figure**: Optimal strategy for a single agent