

Analysis

- **Theorem:** can choose η so that, for any game \mathbf{M} with m rows, and any opponent,

$$\underbrace{\frac{1}{T} \sum_{t=1}^T \mathbf{M}(\mathbf{P}_t, \mathbf{Q}_t)}_{\text{actual average loss}} \leq \underbrace{\min_{\mathbf{P}} \frac{1}{T} \sum_{t=1}^T \mathbf{M}(\mathbf{P}, \mathbf{Q}_t)}_{\text{best average loss } (\leq v)} + \Delta_T$$

where $\Delta_T = O\left(\sqrt{\frac{\ln m}{T}}\right) \rightarrow 0$

- regret Δ_T is:
 - logarithmic in # rows m
 - independent of # columns
- therefore, can use when working with very large games