

 $\mathcal{D}_{w,\mathcal{T}}: \mathcal{W} imes \mathcal{W} \mapsto \mathbb{R}^+$  and World regret function  $\mathcal{R}_{f,\mathcal{T}}: \mathcal{W} imes \mathcal{A}: \mapsto \mathbb{R}^+$ 

Observed Dissimarlity Operator  $\mathcal{D}_{o.\mathcal{T}}: \mathcal{W} imes \mathcal{W} \mapsto \mathbb{R}^+$ 

and Observed regret function

 $\mathcal{R}_{o,\mathcal{T}}:\mathcal{O} imes\mathcal{A}:\mapsto\mathbb{R}^{+}$ 

 $E_{t}$ 

Experience Tensor

(World experience only accessible to oracle)