$$\Omega = \{P_{o_1}, P_{o_2}, P_{o_3}, P_{o_4}\}$$

$$P(\mathbf{o}_t | \mathbf{s}_t) \qquad P_{o_3}(\mathbf{a}_t^{\dagger} | \mathbf{s}_t)$$

$$P_{o_2}(\mathbf{a}_t | \mathbf{s}_t) \qquad P_{o_4}(\mathbf{a}_t | \mathbf{s}_t)$$

$$P_{o_1}(\mathbf{a}_t | \mathbf{s}_t) \qquad \hat{o}_2$$

$$P_{o_1}(\mathbf{a}_t | \mathbf{s}_t) \qquad \hat{o}_1$$

 $P(\hat{\mathbf{o}}_t = \hat{o}_4 | \mathbf{s}_t, \hat{\mathbf{o}}_{t-1}) \rightarrow \mathbf{a}_t \sim P(\mathbf{a}_t | \mathbf{s}_t, \hat{\mathbf{o}}_t = \hat{o}_4)$

 $P(\mathbf{o}_t = o_4 | \mathbf{s}_t) \rightarrow \mathbf{a}_t \sim P_{\mathbf{o}_t = o_4}(\mathbf{a}_t | \mathbf{s}_t)$