We describe how the robot teaming model can be computationally encoded as a Markov Decision Process. A Markov decision process is a tuple $\{S, A, T, R\}$, where:

- S is a finite set of states of the world; it models the set of world environment configurations.
- A is a finite set of actions; this is the set of actions the robot can execute.
- $T : S \times A \longrightarrow \Pi(S)$ is the state-transition function, giving for each world state and action, a probability distribution over world states; the state transition function models the variability in human action. For a given robot action a, the human's next choice of action yields a stochastic transition from state s to a state s'. We write the probability of this transition as $T(s, a, s')$. In this formulation, human behavior is the cause of randomness in our model, although this can be extended to include stochasticity from the environment or the robot actions, as well.
- $R : S \times A \longrightarrow \mathbb{R}$ is the reward function, giving the expected immediate reward gained by taking each action in each state. We write $R(s, a)$ for the expected reward for taking action a in state s.