Learning Communication Policies for Knowledge Transfer between Agents

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Abstract

We present an agent model in the predictive coding framework that selectively communicates with other agents to predict the state of its environment efficiently. Selective communication is a challenge when the internal models of other agents are unknown and unobservable. Communication helps agents to transfer the knowledge they have acquired in different situations. Recognition of daily activities of individuals living in different homes served as a testbed for evaluating the model. Two publicly-available datasets, collected from unique homes, are used. Behavioral patterns of individuals in those homes are also unique. Each home is assumed to be monitored by an agent. We experimentally show that the agents can transfer knowledge by communicating the most informative messages. The messages are interpretable. The agents learn patterns of daily activities for any individual, and communicate using a vocabulary of words. Our model is more accurate than traditional transfer learning models for the same task.