Social Learning with Sparse Belief Samples

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Abstract

We present a model of social learning over networks were individuals with insufficient and heterogeneous sources of information aggregate their private observations with samples from belief distributions of their neighbors in order to learn an underlying state of the world. We presume two behavioral assumptions. The first assumes communication constraints in that agents can only share, in each round, a single sample from their belief on the true state with their neighbors. This is in contrast with standard models of sharing the full belief, i.e. the entire probability distribution over the set of parameters. The second behavioral assumption points to an updating scheme according to which agents use simple linear rules to aggregate their neighbors' actions with their private Bayesian posterior. We rigorously analyze the asymptotic behavior of such an update and show that so long as all the individuals trust their neighbors more than their private information sources, they do not learn the true parameter with positive probability. Social learning can occur, however, if the society contains confident individuals that are experts in distinguishing different alternatives from truth, even though no single individuals may be able to distinguish the truth on her own. Our results indicate that social learning is possible even when agents only share a single sample from their belief distribution.