Abstract:
In many decisions under uncertainty, technological constraints restrict both the acts which an agent can perform and the events which she can observe. To address such situations, we assume that the set of possible states of the world and the set of possible outcomes each have a topological structure. The only feasible acts are continuous functions from states to outcomes, and the only observable events are regular open subsets. We axiomatically characterize a Subjective Expected Utility (SEU) representation of \textit{ex ante} preferences in this environment. Our SEU representation involves a continuous utility function on the outcome space (unique up to positive affine transformations), and a unique probability measure on the Boolean algebra of regular open subsets of the state space. With additional topological hypotheses, we obtain a unique Borel or Radon probability measure, along with an auxiliary apparatus called a \textit{liminal structure}, which describes the agent’s informational constraints, and generalizes the classical SEU representation.