

**Abstract**

The paper studies sequential information acquisition under ambiguity about the relevant states in a setting where an agent decides for how long to collect information before taking an irreversible action. The agent optimizes against the worst-case belief and updates prior by prior. We show that due to changes in the worst-case scenario over time, the agent is faced with a problem of time inconsistency. The agent resolves the conflict with her future selves by using an information acquisition rule that is non-monotonic and features random stopping for intermediate sets of beliefs.