

Thesis Project Portfolio

**A Working Theory of a Learned Model in a Partially Observable Environment for
Cognitive Decision-Making**

(Technical Report)

Impact of Artificial Intelligence Systems on Cognitive Liberty

(STS Research Paper)

An Undergraduate Thesis

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Table of Contents

Sociotechnical Synthesis

A Working Theory of a Learned Model in a Partially Observable Environment for Cognitive Decision-Making

Impact of Artificial Intelligence Systems on Cognitive Liberty

Prospectus

Sociotechnical Synthesis

To tackle the increasingly devastating and complex problems in the world, we need to make the best decisions possible. To efficiently improve our decision-making, it is essential to understanding how we make decisions. For many years we have strived to uncover the mysteries of our own cognitive process of decision-making. Human have created policies to optimize procedures and have made advances in neuroscience, however, our own complex decision-making processes have not yet been fully articulated computationally. An outline for a learned model, using the latest advancements in action-selection policy methods, operating in a partially observable environment is theorized and its cognitive representations as well as additional considerations are discussed. The behavioral dimensions of an artificial intelligence with human-like decision-making processes would have significant implications, both from insight into internally improving our decisions and the external influence on our decisions. The affects of cognitive and artificial intelligence interactions will be explored through the user-centered design approach in the inclusion dimension of the Responsible Innovation framework. The perspective of user-centered design considers the desires of and impact on the user at every stage of the system's process. A case analysis was orchestrated to analyze cases in the following categories: thought reform, external influence, and stratagem. Together, the cases will create the base of the user-centered design approach used to evaluate the impact of artificial intelligence systems on our cognitive liberty. The research is expected to provide a deeper insight into potential effects of artificial intelligence on our thought processes when it comes to decision-making. The potential influence of intelligent systems highlights the need for the consideration of the social and ethical stakes associated with the systems' development in the effort to enable the continued protection of the universal human right of the freedom of thought.