

1. Research project objectives

The aim of the project is to provide a systematic investigation of the conditions under which information gathering is a rational means for pursuing our goals. Given that the goals of human inquiry can be divided broadly into pragmatic and epistemic ones, this investigation revolves around two main questions:

Pragmatic Value of Information (PVI): When and under what conditions is information gathering *pragmatically rational*? That is, under what conditions should we, as agents concerned solely with practical benefits, look for more information before making a decision? For example, under what conditions is it rational to postpone a decision whether to take an umbrella and consult online weather services?

Epistemic Value of Information (EVI): When and under what conditions is information gathering *epistemically rational*? That is, under what conditions should we, as agents concerned solely with truth, look for more information before endorsing certain cognitive states, e.g., beliefs, degrees of belief, or acts of acceptance, toward propositions or hypotheses? For example, under what conditions is it rational to postpone a decision whether to accept a scientific hypothesis and perform research at the Large Hadron Collider?

2. Research tasks and research hypotheses

The project explores three aspects pertaining to PVI and EVI: **decision-theoretic**, **probabilistic**, and **empirical**. The first aspect is explored in the project by utilizing various tools of decision theory to provide a modelling framework and, second, to evaluate information acquisition in terms of its pragmatic and epistemic consequences by employing various kinds of practical and epistemic (cognitive) decision theories. The main hypothesis concerning this aspect is that the conditions under which information acquisition is rational for agents concerned solely with practical goals is significantly different from the conditions under which information acquisition is rational for agents concerned solely with epistemic goals such as seeking the truth and avoiding error.

The probabilistic aspect is explored by focusing on probabilistic methods of belief revision that offer very useful and fine-grained models of information gathering. By exploring this aspect, the project provides a systematic and precise understanding of the process of information gathering. Given the variety of learning inputs which can influence one's belief state and various ways by which we can understand one's belief state, there is no single and universal probabilistic belief-revision rule. One of the project's principal tasks is to show what kind of those rules, and hence what kind of information gathering modelled by those rules, is a rational means for pursuing both pragmatic and epistemic goals.

The empirical aspect is explored by studying various bounded rationality phenomena. In recent years elicitation of those phenomena has given rise to models of bounded rationality that take into account limitations of human capacities, e.g., limited knowledge of the world, limited ability to evoke this knowledge, limited ability to work out consequences of actions, limited ability to conjure up possible courses of action, limited ability to cope with uncertainty. The main thesis concerning this aspect is that given the bounded rationality phenomena and the models of rationality designed to cover them, it is not immediately clear that it is always rational to gather information.

2. Reasons to conduct research

It is rather commonly accepted wisdom that information should never be ignored, and that we should look for more information before making a decision. Yet intuitively there are situations in which gathering information seems irrational, e.g., when the practical costs of gathering information outweigh the practical benefits or when performing an experiment could lead to misleading results. Importantly, the conditions under which information acquisition is rational for agents concerned solely with practical goals can be significantly different from the conditions under which information acquisition is rational for agents concerned solely with epistemic goals such as seeking truth and avoiding error. Moreover, given the bounded rationality phenomena and the models of rationality designed to cover them, it is not immediately clear that it is always rational to gather information. So while information gathering is part and parcel of our daily life and scientific practice, the existing theories explaining the value of information provide little systematic and comprehensive understanding of why, and when, this sort of human activity can be deemed rational. The aim of the project is to alter this situation.