

## Complexity over Uncertainty in Generalized Representational Information Theory (GRIT): A Structure-Sensitive General Theory of Information

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### Abstract

What is information? Although researchers have used the construct of information liberally to refer to pertinent forms of domain-specific knowledge, relatively few have attempted to generalize and standardize the construct. Shannon and Weaver(1949)offered the best known attempt at a quantitative generalization in terms of the number of discriminable symbols required to communicate the state of an uncertain event. This idea, although useful, does not capture the role that structural context and complexity play in the process of understanding an event as being informative. In what follows, we discuss the limitations and futility of any generalization (and particularly, Shannon' s) that is not based on the way that agents extract patterns from their environment. More specifically, we shall argue that agent concept acquisition, and not the communication of states of uncertainty, lie at the heart of generalized information, and that the best way of characterizing information is via the relative gain or loss in concept complexity that is experienced when a set of known entities (regardless of their nature or domain of origin) changes. We show that Representational Information Theory perfectly captures this crucial aspect of information and conclude with the first generalization of Representational Information Theory (RIT) to continuous domains.

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