Title: Relevance Maps Part 1: Introduction and Complexity

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Abstract

We define what we mean with a relevance map. We start a rate-distortion scenario that trades the number of faithfully transmitted input parameters - the rate - with the accuracy of the classification - or distortion. A good relevance ordering of the input parameters gives the smallest distortion for a given rate. Conversely, a good distortion map gives the necessary input parameters to achieve a given distortion. These concept help us define a relevance map and compare different relevance maps against each other.

We discuss the problem of finding the smallest number of paramter to achieve a given distortion as a decision problem and integrate it into a hierarchy of artificial intelligence problems. We show the problem is NP^{PP}-complete via a series of reductions.