Discrete Measurement of Sensory Information using Bayesian Networks

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Abstract

In principle, information theory can be used to measure the amount of information generated by sensory apparatus. This can be the basis for evaluating the viability of a cognitive model. In practice, however, such checks are rarely made due to the complexity of agent-level, informational analysis. Where it is the agent itself which is the 'receiver', measurement of sensory information involves determining the way interpretive processes affect stimulus probabilities. No practical method for performing this type of analysis has been developed. The paper shows, however, that Bayesian networks can be adapted for this usage. Illustrative examples are given in three domains but the method is completely general and can be applied to any model which has a sensory component.

Keywords: sensory information, theoretical cognitive science, sensory informatics, Bayesian modeling

1 Content

See (Thornton, 2008) for a more complete exposition.

References

Thornton, C. (2008). *Agent-level, Context-sensitive Measurement of Sensory Information*. Unpublished MS (www.christhornton.eu/papers/discrete-sensory-information. pdf)