

Proposal Computational Psychology

May 1, 2022

1 Background

The problem are project is focusing on is Shepard's ideal generalization problem. The generalization problem focuses on how humans build hypothesis spaces for a given consequence after observing stimuli. In the paper "Generalization, similarity, and bayesian inference", they discuss how using a model of bayesian inference, we can predict the probabily of given stimuli being included within the consequential region [TG02]. The model uses the equation $p(y \in C \mid x) = \sum_{h: y \in h} p(h|x)$ where h is a hypothesis from the hypothesis space \mathcal{H} and $p(h|x)$ is the posterior probabily of the hypothesis after observing x . We plan to extend this model to investigate how including negative examples within the x vector(x is the observed stimuli) affect how the model limits hypotheses. We also plan to explore how different distrubitions and models compare to the original model for generalization.

2 Question

How can the model be improved to handle negative examples and discontinuous hypotheses?

3 Method

References

- [TG02] Joshua B. Tenenbaum and Thomas L. Griffiths. "Generalization, similarity, and bayesian inference". In: *Behavioral and Brain Sciences* 24 (4 Aug. 2002), pp. 629–640. DOI: 10.1017/s0140525x01000061. URL: <https://doi.org/10.1017/s0140525x01000061>.