Brain Function: Free Energy, Predictive Processing and Active Inference

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Abstract *A potential new theory of brain function based on Bayesian inference could be that the brain is a predictive processing system that generates internal models of the world to make predictions about future sensory inputs. According to this theory, the brain generates internal models based on prior beliefs and past experiences, which are used to make predictions about future sensory inputs. In summary, the free energy principle focuses on minimizing the difference between the predicted and actual sensory inputs using a hierarchical generative model, while the predictive processing theory focuses on generating and updating internal models to make predictions about future sensory inputs.*

Introduction

One theory of brain function that is based on Bayesian inference is the free energy principle, which proposes that the brain seeks to minimize the difference between its internal model of the world and the sensory inputs it receives [1]. This process is thought to be implemented by performing Bayesian inference, which involves updating prior beliefs based on new evidence in a probabilistic manner. However, a potential new theory of brain function based on Bayesian inference could be that the brain is a predictive processing system that generates internal models of the world to make predictions about future sensory inputs. These