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Modeling Capacity-Limited Decision Making Using a Variational Autoencoder

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Abstract

Due to information processing constraints and cognitive limitations, humans must form limited representations of complex decision making tasks. However, the mechanisms by which humans generate representations of task-relevant stimulus remain unclear. We develop a model that seeks to account for the formation of these representations using a β -variational autoencoder (β -VAE) trained with a novel utility based learning objective. The proposed model forms latent representations of decision making tasks that are constrained in their information complexity. We show through simulation that this approach can account for important phenomena in human economic decision making tasks. This model provides a method of forming task-relevant representations that can be used to make decisions in a human-like manner.