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Emotion-Color Association in Biologically Inspired Deep Neural Networks

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Abstract

Deep Neural Network representations correlate very well with neural responses measured in primates' brains and with psychological representations of human similarity judgement tasks, making them possible models for human behavior-related tasks. This study investigates whether DNNs can learn an implicit association (between colors and emotions) for images. An experiment was conducted in which subjects were asked to select a color for a given emotion-inducing image. These human responses (decision probabilities) were modeled on neural networks using representations extracted from pre-trained DNNs for the images and colors (a square of the color). The model presented showed a fuzzy linear relationship with the decision probabilities. Finally, this model was presented as a model for emotion classification tasks, specifically with very few training examples, showing an improvement in accuracy from a standard classification model. This analysis can be of relevance to psychologists studying these associations and AI researchers modelling emotional intelligence in machines.