# Feature Distribution Learning: what it is, what have we found using this method, and what does it all mean for perception

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The visual world is rarely simple: A patch of snow is never purely white, the books on the shelf never stand exactly at the same angle, and cookies in a pack would never be perfectly round. It might annoy our inner perfectionists, yet the fact remains that features vary within groups of similar objects or even within the simplest objects. Surprisingly, we do not know much about how this heterogeneity is represented: do we really keep track of all the variability forming precise probabilistic templates, do we discard it and only account for the simplest summary, or do we do something else? To answer this question, several years ago, we introduced a simple behavioural method based on the visual search task, later coined Feature Distribution Learning. The initial study showed that heterogeneity in stimuli features is represented with a surprising level of details in contrast to what was assumed before. This sparked follow-up projects aimed to test the limits of these representations and how they are obtained, as well as studies designed to use this method to answer general questions about the nature of perceptual representations. In this talk, I will provide a brief summary of this line of research and discuss some of the outstanding questions.