Hierarchical Grouping of Simple Visual Scenes

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Abstract

Human visual grouping processes consolidate independent visual objects into grouped visual features on the basis of shared characteristics; these visual features can themselves be grouped, resulting in a hierarchical representation of visual grouping information. In the present study, participants provided free-response groupings of a set of stimuli that contained consistent structural relationships between a limited set of visual features. These grouping patterns were evaluated for relationships between specific visual features and the participant's grouping patterns. We observed that the relative size of the visual features differentiated groupings across levels of the grouping hierarchy, while the form of visual objects and features distinguished separate groups within a particular level of hierarchy. These consistent relationships between visual feature characteristics and placement within a grouping hierarchy can be leveraged to advance computational theories of human visual grouping behavior, which can in turn be applied to effective design for interfaces such as voter ballots.

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