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Gestalt principles support grouping of perceptual information

Visual perception is difficult for the human visual system because the input to the system is often very complex. An easy way to facilitate visual perception is to simplify the visual information. For example, if there are many objects in view, they can be grouped together. Three of the visual Gestalt principles which support grouping are continuity, similarity, and proximity. This paper will describe how these principles support grouping together the elements of maps, elements of software interfaces, and data points in scatterplots.

Maps often contain more information than needed to show a particular route between two given points. To assist the visual system to clearly see a route through a complex map, the route can be highlighted. In Figure 1, there are hundreds of small road segments shown. Despite the complexity of the map, the highlighting allows a set of road segments to be perceived as a continuous route. In this example, the principle of continuity guides the viewer clearly between two given points. The continuity of the highlighted route facilitates perception of the most needed information on a map without sacrificing the generality of the map, which may be used to find alternate routes as well.

In order to ease the user experience of interacting with a computer, elements in a display can be perceptually grouped by making the elements similar to one another. For example, the tabs on a web browser are easily perceived as a group because they the same shape. Moreover, the virtual keys on a touch-screen keyboard are perceived as part of a group because they are the same colour, and share similar edge contours. The grouping by similarity allows the user to see a simplified interface, yet the amount of information in the display is preserved.

Scatterplots are an excellent way to facilitate pattern detection in a data set. One type of pattern in a data set is a group. There may be a subset of data points which have close proximity to one another. In this case, the viewer can easily use the proximity of these points to distinguish as a sub-group. Thus, spatial proximity of data points in a scatterplot can rapidly support pattern detection. Because scatterplots allow Gestalt principles to support pattern detection, they are an effective form of information visualization.

Effective sports teams and corporations must be organized. Organization transforms an array of elements into a coherent whole. In the same way, perceptual organization allows an array of perceptual elements to be seen as a coherent visual display. Basic Gestalt principles such as continuity, similarity, and proximity support grouping of objects, organizing the perceptual information contained in maps, software interfaces, and scatterplots.

Figure 1. Road map.