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Swarm Behaviour for Visual Data Mining

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The increasing complexity of many data analysis procedures makes it really difficult for the user to extract useful information out of the results given by the various used techniques. Information visualization and visual data mining can help to deal with the flood of information and to interpret those results. Visual data mining on heterogeneous, imprecise and incomplete information systems need different representations according to human perception (Berthold and Hand 2003). The advantage of visual data exploration is that the user is directly involved in the data mining process. For example, it should allow the user to navigate inside the data, to interact with objects, etc., to be able to create living experience and to see the whole world or concentrate on specific details (Valdés 2004). In this contribution we explore a visualization approach based on techniques borrowed from swarm behaviour, particularly Particle Swarm Optimization (Montalvo et al. 2008). It is able to visualize multidimensional data, uses both standard 2D/3D and dense pixel displays and is based on different interaction/distortion techniques, such as projection, filtering and zooming. The basic idea is to present abstract multidimensional data in some visual form, allowing the user to get concepts visually, draw conclusions, and directly interact with the data.

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