UDC 504.05

REPRESENTATION OF ENVIRONMENTALLY HAZARDOUS OBJECTS IN STATE SPACE

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In papers [1-4], the algorithms of technogenic danger have been studied from the point of view of set theory. From the very beginning of these studies, hazards have been used as input data for them. These dangerous factors acted as coordinates in n-dimensional space. Many important properties of the algorithms underlying the regulatory acts assessing the technogenic hazard were found. For example, in the space of dangerous factors, areas were found in which the algorithms of regulatory acts worked unstably. These areas have been called areas of questionable decisions. These areas have been found to have a complex shape. Despite the fact that this approach uses the coordinate method, this was not explicitly indicated. The usage of coordinate method in this way has a long history. The space of dangerous factors that was introduced in [1-4] is similar to another mathematical object, namely, the state space. This space is also called phase space. But in this paper, we used the concept of "state space". The usage of this concept implies an approach to solving a fairly large class of problems. In papers [1-4], such approach has been used, but its application was not explicitly specified. In contrast to [1-4], this paper explicitly indicates the use of the "state space" methodology. Projections of the n-dimensional state space onto the three-dimensional space allow one to visually see the behavior of a dangerous object in the state space. An environmentally hazardous object in the state space (its projection onto a 3-dimensional space) may look like this (Figure 1).

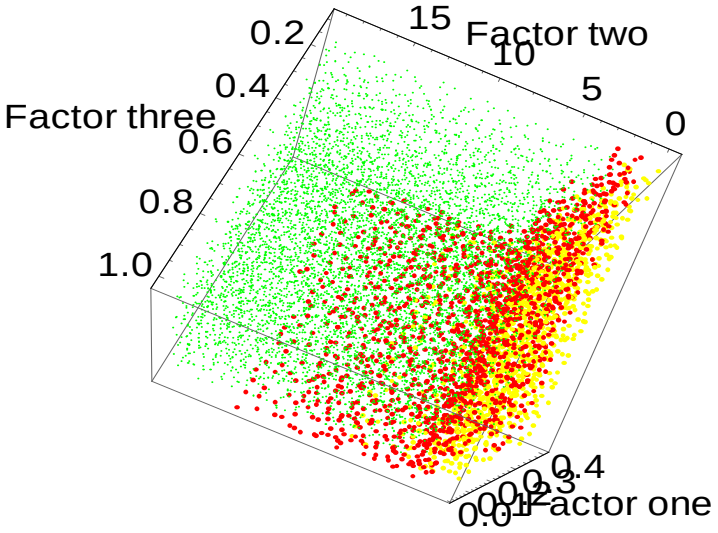

Figure 1 – Yellow dots represent environmentally dangerous objects, green – safe, red – areas of doubtful decisions

Here, an environmentally dangerous object is considered from a general point of view without going into details of its nature and the nature of the hazards that characterize it. Dangerous factors are simply numbered. Figures 2-5 give an idea of the location of dangerous safe and questionable decision areas.

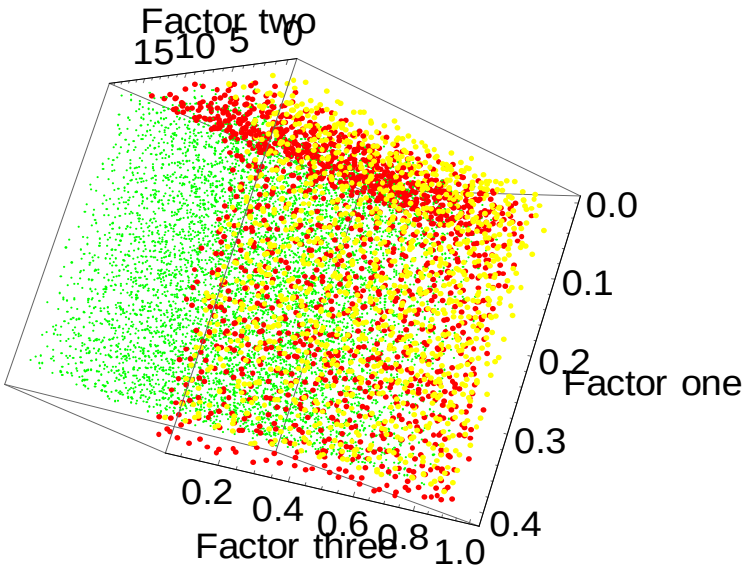

Figure 2 – The same view from a slightly different angle

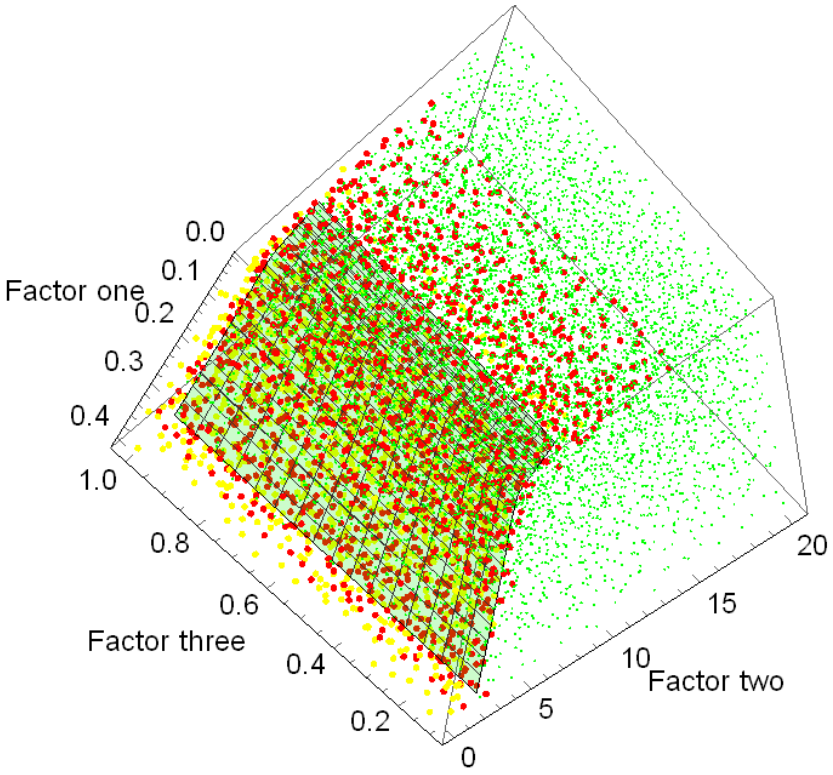

Figure 3 – The boundary of dangerous and safe zones (green). The questionable decision areas have red dots

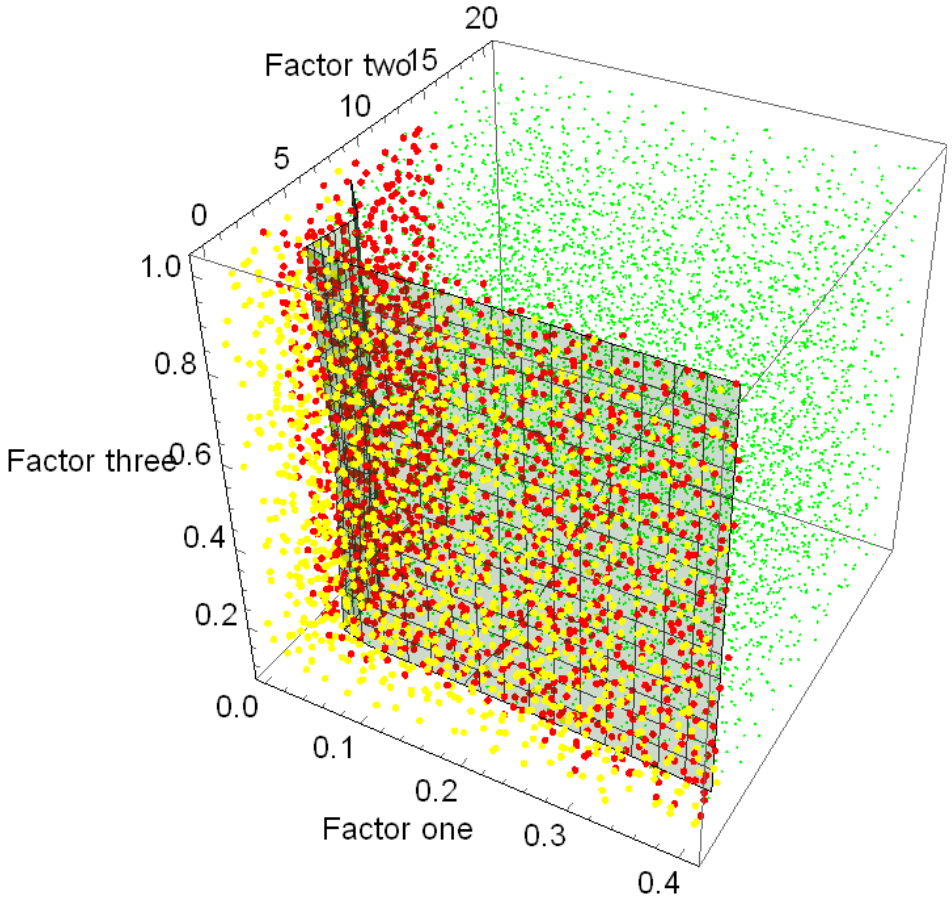

Figure 4 – The boundaries of dangerous and safe zones (green)

This paper allows not only to evaluate the ways of processing data on an environmentally dangerous object, but also to determine their positive and negative properties. An investigation in the state space of an ecologically dangerous object makes it possible to evaluate the reliability of methods for studying such an object.

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