

## **A new method for determining the significance level of decision-making criteria based on characteristic objects**

The project aims to create a new method of determining the significance levels of decision criteria (decision weights) of high efficiency using characteristic objects. We often come across various types of rankings and evaluations in everyday life. When a device breaks down, we usually look for a ranking of top "k" devices to find a suitable device that will meet our requirements at the lowest price as soon as possible. We rarely wonder how the weights were identified in such rankings. It is a fundamental question because both the evaluation of a given offer and its position in the ranking depends on them. This is particularly important in the case of multi-criteria problems, e.g., an official tender for a construction contractor. The multiplicity of criteria, and thus the need to determine a large number of significance levels criteria, is an important challenge due to the decision made.

This project aims to determine the accuracy of the current criteria weighting methods and propose a new method based on characteristic objects. In addition, the draft method is to be able to identify both local and global weights. Local weights can change their value depending on the context and place in the decision making space in which we find our alternative. It is connected with limited ability to compensate for features. A simple example can be used where no matter how much salt you want to use, the soup will not become more fucking. This simple example also shows the important role of local weights, the value of which depends on the current level of satisfaction of a certain attribute. With a low level of satisfaction, this attribute is much more desirable than the others, and with its saturation the level of significance decreases.