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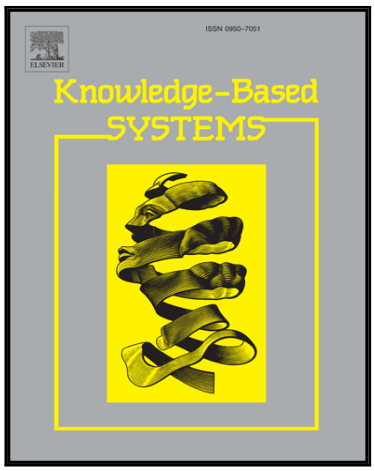

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Effectiveness measures in movement-based three-way decisions

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Abstract

A trisecting-and-acting model of three-way decisions includes a step of dividing a universal set into three regions and another step of developing strategies and actions to process objects in the three regions. The effectiveness of three-way decisions depends on both trisecting and acting. We consider a special type of three-way decisions in which strategies facilitate movements of objects from unfavorable regions to favorable regions. We study effectiveness measures of strategies and actions based on object movements. These measures are composed of two parts. A desirability matrix represents preferred and non-preferred directions of movements. A pair of a benefit matrix and a cost matrix represents, respectively, the benefit and cost associated with a movement. An effectiveness measure of actions and strategies is the summation of benefits and costs of movements for all objects.

Keywords: trisecting-and-acting model, three-way decision, effectiveness measure

1. Introduction

One of the commonly used methods in human problem solving is to divide a whole into three parts and to process the three parts as a way to deal with the whole [5, 27, 31]. By extracting ideas of thinking in threes from many different fields, Yao [28, 31] introduced a theory of three-way

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