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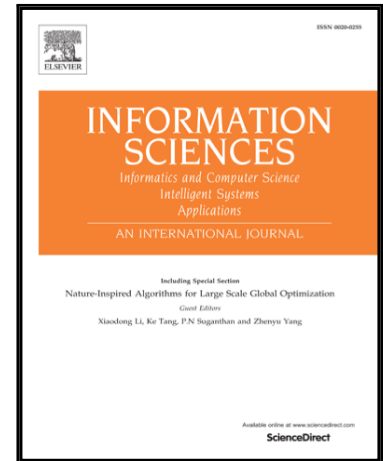
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On the equality of integrals

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Abstract

Considering a finite space X , several necessary conditions and one rather general sufficient condition describing when the Choquet integral coincides with the pan-integral with respect to the standard arithmetic operations are shown. These conditions are characterized by using the minimal atoms of monotone measure. Under the introduced constraints, the calculation of these coinciding two integrals is also given.

Keywords: Monotone measure; Choquet integral; Pan-integral; Concave integral; Minimal atom

1. Introduction

The Choquet integral [4], the pan-integral [32] and the concave integral [14] are three kinds of prominent nonlinear integrals with respect to monotone measure (or capacity), see, for example [3]. All these integrals have numerous application in economy, social sciences, data fusion, multicriteria decision support, etc., see, for example, [8, 10, 18]. It is well known that for the σ -additive measures all the three types of integrals coincide with the Lebesgue integral (i.e., these three integrals can be seen as particular generalizations of the Lebesgue integral). All these integrals can be seen as particular instances of decomposition integrals [6] (see also [23, 24, 25]). However, in general case they are significantly different from each other ([22, 24, 25]). Recall that the concave integral is the greatest decomposition

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