

Aggregation of fuzzy metrics and its application in image segmentation

Nebojša M. Ralević • Marija Delić • Ljubo Nedović

Abstract

This paper proposes a novel method for the construction of a fuzzy metrics and demonstrates application in image segmentation. Some new properties of t-norms, t-conorms, aggregation functions, and fuzzy metrics are proved, which provides the procedures for constructing a new fuzzy metric. We prove that by applying some types of t-norms, t-conorms and aggregation functions on the sequence of fuzzy metrics, a new fuzzy metric could be obtained. The application of the fuzzy metric constructed in this way is illustrated in image segmentation by using the FCM algorithm. For the purpose of constructing a new fuzzy metric, an extended aggregation function called generalized quasi-arithmetic mean is considered.

Keywords: Aggregation functions, distance function, fuzzy metric, image segmentation, triangular conorms, triangular norms

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