FUZZY MATROIDS FROM FUZZY VECTOR SPACES

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Abstract: In this paper, we have made an attempt to obtain a fuzzy matroid from a fuzzy vector space. As a result, the concept of representable fuzzy matroid is presented with some properties. It is proved through an example that a graphic fuzzy matroid cannot be representable over any field, in general. Also, we established a sufficient condition that a graphic fuzzy matroid occur representable over any given field.

Keywords and Phrases: Fuzzy matroid, fuzzy vector matroid, representable fuzzy matroid.

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1. Introduction

Theory of matroids has vast applications in combinatorial optimization problems, Operation research, system analysis as an abstract generalization of a graph and a matrix. Graphic and representable matroids form a fundamental class of crisp matroids. Goetschel and Voxman [4] characterised fuzzy matroids. In that paper they generalised matroids to fuzzy fields using the concept of fuzzy independent set.

In [15], we presented the idea of inducing fuzzy matroid from a fuzzy graph, namely graphic fuzzy matroid and dealt with some properties of this class of fuzzy matroids. Since vector space is one of the motivation and basic examples of crisp matroids, in this paper we procure the construction of fuzzy matroids from fuzzy vector space, and we obtain a connection between graphic and representable fuzzy matroids.