Some theorems and algorithms for uncertain graphs

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Abstract. The characteristics of an uncertain graph, such as edge-connectivity and diameter, are essentially uncertain variables, instead of constants in a deterministic graph. It is more suitable to investigate the uncertainty distribution of these characteristics. In this paper, we first introduce some fundamental theorems for uncertain graphs. Based on the theorems, algorithms are proposed to calculate the uncertainty distribution of the characteristics of uncertain graphs. The proposed algorithms are also proved to be a polynomial time algorithm, and the effectiveness and efficiency is illustrated by numerical examples.

Keywords: uncertainty theory, uncertain graph, connectivity, diameter