

The Robust Shortest Path Problem by Means of Robust Linear Optimization

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Abstract

We investigate the robust shortest path problem using the robust linear optimization methodology as proposed by Ben-Tal and Nemirovski. We discuss two types of uncertainty, namely, box uncertainty and ellipsoidal uncertainty. In case of box uncertainty, the robust counterpart is simple. It is a shortest path problem with the original arc lengths replaced by their upper bounds. When dealing with ellipsoidal uncertainty, we obtain a conic quadratic optimization problem with binary variables. We present an example to show that a subpath of a robust shortest path is not necessarily a robust shortest path.