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Conservativeness of Probabilistic Constrained Optimal Control Method for Unknown Probability Distribution

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Abstract : In recent decades, probabilistic constrained optimal control problems have attracted much attention in many research field. Although probabilistic constraints are generally intractable in an optimization problem, several tractable methods haven been proposed to handle probabilistic constraints. In most methods, probabilistic constraints are reduced to deterministic constraints that are tractable in an optimization problem. However, there is a gap between the transformed deterministic constraints in case of known and unknown probability distribution. This paper examines the conservativeness of probabilistic constrained optimization method with the unknown probability distribution. The objective of this paper is to provide a quantitative assessment of the conservatism for tractable constraints in probabilistic constrained optimization with the unknown probability distribution.

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