Optimization of temporal networks under uncertainty

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Abstrak

Many decision problems in Operations Research are defined on temporal networks, that is, workflows of time-consuming tasks whose processing order is constrained by precedence relations. For example, temporal networks are used to model projects, computer applications, digital circuits and production processes. Optimization problems arise in temporal networks when a decision maker wishes to determine a temporal arrangement of the tasks and/or a resource assignment that optimizes some network characteristic (e.g. the time required to complete all tasks). The parameters of these optimization problems (e.g. the task durations) are typically unknown at the time the decision problem arises.

This monograph investigates solution techniques for optimization problems in temporal networks that explicitly account for this parameter uncertainty. We study several formulations, each of which requires different information about the uncertain problem parameters.