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On the complexity of burning and broadcasting problems

Given an unweighted, undirected graph, there are many broadcasting and burning protocols for the dissemination of information in (or burning of) the graph. We review some of these protocols from an algorithmic point of view. The focus of the talk will be on telephone broadcasting, the firefighter problem, and the graph burning problem. Finding optimal dissemination schemes is NP-hard in all of these problems. Despite similarities like this, these problems have different behaviour with respect to approximation algorithms. We review a recently-introduced algorithm for the graph burning problem which has a constant approximation factor. Meanwhile, the existing hardness result indicates that the firefighter problem is APX-hard. For telephone broadcasting, the presence of an approximation algorithm with constant factor is an open problem. We review the existing approximation algorithms for telephone broadcasting and pose a few open problems relating the burning and broadcasting problems.