

Zero Forcing and Throttling on Directed Graphs

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Zero forcing is a combinatorial game that models the spread of information on graphs and has applications to problems in linear algebra, electrical engineering, and quantum control. To start the game on a given graph, an initial subset of vertices is colored blue and the remaining vertices are colored white. Then, a color change rule is applied repeatedly to iteratively change the color of white vertices to blue. The goal is to efficiently color every vertex in the graph blue. In recent years, there have been many interpretations of efficiency in zero forcing. The *propagation time* of a subset of vertices is the number of time steps required to color the entire graph blue starting with that subset as the initial blue set. The idea of *throttling* is to find the optimal balance between the size of an initial set of blue vertices and its propagation time. This talk will survey some recent results on zero forcing and throttling in the context of directed graphs.

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