Majority Spanning Trees, Cotrees & Their Applications

Department of Computer Science & Engineering
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1:00 PM, Monday, August 29, 2016
Cudahy Hall, Room 401

We show that in any digraph on a connected underlying graph with non-negative weights on its edges, there is a Majority Spanning Tree for which sum of weights of edges of a fundamental cutset running along each edge of the spanning tree determining the cutset is not less than sum of those running in opposite direction. Similarly, existence of Majority Cotrees and simultaneous existence of majority spanning trees and majority cotrees have been established. We have shown how these structures are important in scheduling transports by minimizing sum of weighted connection times, ranking round robin tournaments by minimizing number of upsets, in settling multiple debts and in construction of transport networks with unbalanced road capacity.

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