



Semester Thesis / Bachelor Thesis / Master Thesis

Variants of Dominating Set

Given a Graph $G = (V, E)$, the Minimum Dominating Set Problem asks for a smallest set of nodes $D \subseteq V$, so that every node $v \in V$ has a neighbor in D or is contained in D . In other words, find some nodes so that every node is either part of these nodes or is connected to them via an edge – and use as few nodes as possible.

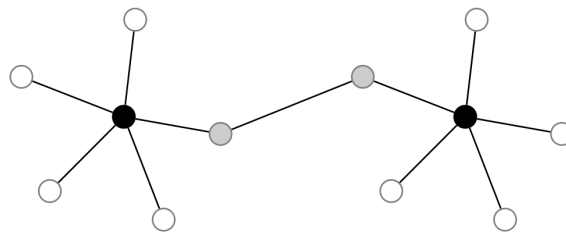


Figure 1: The black nodes form a Minimum Dominating Set for the given graph, adding the grey nodes would create a Connected Minimum Dominating Set.

Variants of the Dominating Set Problem seek for such a set with additional properties and/or relax these constraints – for example ensuring that each node is still dominated, even if some nodes are removed from the graph or by just looking at specific graph families, like planar graphs. In many cases, only an approximation algorithm is possible in polynomial time, unless $P = NP$.

While a lot of research has been published on the more general modifications of the problem, many specific variants motivated by certain scenarios or applications still await thorough research – maybe by you?

Interested? Come to our office for coffee and a small chat or contact us by email / phone.

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