Edge Dominating Set

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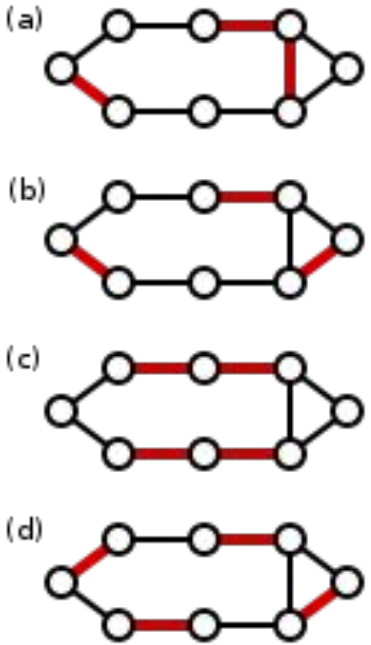
What is a Dominating set?

A dominating set for a graph G = (V, E)
is a subset D of V such that every vertex not in D is adjacent to at least one member of D.

So an **edge-dominating set** is?

- NP-Complete Problem [4]
- FPT algo. of $O^{\star}(2.3147^{k})$ [3]



Problem Statement

- Optimization version : Given a graph G=(V, E),find a subset $E^\star$ of E of minimum size such that all edges not in $E^\star$ is adjacent to at least one edge in $E^\star$

- Decision version : Given a graph G=(V, E) and an integer parameter k,is there a subset $E^\star \subseteq E$ of atmost k edges such that $\{u, v\} \cap V(E^\star) \neq \phi$ for all edges $\{u, v\} \in E$.

  ie, every edge not in $E^\star$ is adjacent to at least one edge in $E^\star$.

WORK PLAN

- Refer and study papers mentioned
- Look for additional materials

References

- [1] geeks4geeks
- [2] https://en.wikipedia.org/wiki/Edge_dominating_set
- [3] Mingyu Xiao, Ton Kloks, Sheung-Hung Poon,New parameterized algorithms for the edge dominating set problem,Theoretical Computer Science,Volume 511,2013,Pages 147-158,ISSN 0304-3975,https://doi.org/10.1016/j.tcs.2012.06.022.
- [4] Yannakakis, Mihalis & Gavril, Fanica. (1980). Edge Dominating Sets in Graphs. SIAM J. Appl. Math.. 38. 364-372. 10.1137/0138030.