# Review of: "Determining Affinity of Social Network using Graph Semirings"

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Potential competing interests: No potential competing interests to declare.

This paper introduces and studies a simple invariant for a graph $G=(V, E)$: $\beta_G = 1+2|E|/|V|$. The presence and meaning of each element in the formula is clearly explained. Most of the remainder is dedicated to an example on Facebook. Based on a reference, a user is classified in one or more of four types: $G_1$ (relationship builders), $G_2$ (town criers), $G_3$ (selfies), $G_4$ (window shoppers); a further set $G_5$ (others) is considered. Given a Facebook network $G$ (a small example is given), the Authors build a graph $G'$ with $G_1, \ldots, G_5$ as vertices, and an edge joining $G_i$ with $G_j$ if and only if the two classes the intersection graph $G_{i, j}$ is not empty. Moreover, each edge carries a weight given by $\beta_{G_{i, j}}$. A number called {\it stability} is defined for a path in $G'$.

The Authors claim that stability can be used in the important Facebook feature of suggestions for new friends. To me, however, is not clear why it should be particularly important to establish friendships across the different classes; nor why stability might be a value in this choice.

I have some practical comments. I think that a figure depicting the single intersection graphs $G_{i, j}$ might be of great help to the reader. I also recommend always using the same term for the same concept: ``loop'', although a common term in network theory, has a very special meaning in graph theory; elsewhere the Authors use the word `cycle'' and I suggest to stick at it. Same thing for ``discrete graph'', by which I assume that ``empty graph'' (also used elsewhere in the paper) is meant.

In conclusion, I find the paper correct but weakly motivated.