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

John L. Pfaltz[1]

1 University of Virginia, Charlottesville

Potential competing interests: No potential competing interests to declare.

Determining Affinity of Social Network using Graph Semirings

Gete Umber and Saifur Rahman

I read through this submission rather quickly to get a general sense of its content, and was rather intrigued with it. The Facebook application looks like a perfect fit. But as I re-read it more carefully, I became disenchanted. I cannot recommend it for publication.

My reasons are:

1) The title (and abstract) are overblown. The term “graph semiring” only appears at the end of Section 1 (p.3), and then in conjunctions with other works by the authors. This paper only invokes “graph decomposition into subgraphs” which could be part of its title. (This referee also feels that calling graphs under union, intersection & complement a “semi-ring” is a bit dubious. But that is irrelevant to this submission.)

2) \beta_G is defined as \beta_G = A_{d(g)} + 1 (p.2, line 19), so \beta_G is just average vertex degree plus one.

To say “Unlike the average vertex degree A_[d(G)}, its function \beta_G is a consistent rule to compare a graph’s connectivity with its subgraphs” (p. 2, lines 26,27) is pure nonsense. It is just average vertex degree.

Furthermore, to say “\beta_G will always be greater than or equal to that of its subgraphs” seems intuitive and is normally true, but “always”. Consider a graph G on 2*n vertices where G_1 is the complete graph on n vertices {1, …, n} and G_2 on {n, n+1 , …, 2n} is a “linear graph” with E = {(i, i+1)} , n <= i <= 2n - 1. Then A_G = (n*(n-1) + 2n) / 2n = (n-1)/2 + 1, while A_G_1 = n-1 and A_G_2 = 2/n.

It is true in Figure 2 of the paper where A_G = 7.47 and A_G_1 = 3.2, A_G_2 = 3.55, A_G_3 = 2.4, A_G_4 = 0, A_G_5 = 3.7. But again not always.

3) (P.2, line -5) “\beta_G will be a preferred choice over A_d(G). An interesting property of \beta_G is that it preserves he importance of order and size besides measuring its connectivity.” No. \beta_G is just A_d(G), average vertex degree. No scalar can do all this!

4) Nowhere is \beta_i,j between subgraphs G_i G_j in Fig. 2 defined. It appears to be based on | G_i \cap G_j |

somehow. All such intersections, except G_2 \cap G_3, seem to consist of only 2 vertices. Why? Why are \beta_1,3 and \beta_3,4 = 0? The intersection subgraph is nonempty in both cases.

5) (p. 5, last line). “Each edge is assigned its beta index.” How is this defined/done?

6). (p. 6). Here I admit that I just gave up. I could not figure out the formula for r_j on line -5. Figure 4 does not help.

Four of the 10 references are self-referential. The authors are encouraged to look at the several graph based algorithms in the ASONAM Conference series.

I’m sorry, but this is just not of publishable quality. Could it be revised sufficiently? That I can’t estimate.