

Localization of eigenvector centrality and an alternative perspective

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Eigenvector centrality is a common metric for determining the most significant individuals in a network. However, it is increasingly apparent that it has significant flaws which can make it unreliable.

I will discuss recent work in the physics literature on the phenomenon of 'localization' of eigenvector centrality. Localization in this context means that the centrality becomes unreasonably focussed on specific parts of the network which can lead to uninformative results and incorrect conclusions.

It is reasonably well-known that localization occurs when there are highly connected individuals which take up a large proportion of the centrality. Building on previous observations, I will discuss similar problems when the network can be easily fragmented and I will derive an approximate equation describing these effects.

I suggest that these problems are symptomatic of fundamental problems with the justification of this metric. As a resolution, eigenvector centrality is perhaps better-interpreted as an approximation to more robust measures such as Katz centrality, rather than as a centrality itself.