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Relative edge betweenness centrality

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Abstract: We introduce a new edge centrality measure – relative edge betweenness $\gamma(uv) = b(uv)/\sqrt{c(u)c(v)}$, where $b(uv)$ is the standard edge betweenness and $c(u)$ is the adjusted vertex betweenness. In this alternative definition, the importance of an edge is normalized with respect to the importance of its end-vertices. This gives a better presentation of the “local” importance of an edge, i.e. its importance in the near neighborhood. We present sharp upper and lower bounds on this invariant together with the characterization of graphs attaining these bounds. In addition, we discuss the bounds for various interesting graph families, and state several open problems.

Keywords: Betweenness centrality, social networks.

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Relativna povezavna vmesnost

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Povzetek: Vpeljemo novo povezavno središčno mero – relativno povezavno vmesnost $\gamma(uv) = b(uv)/\sqrt{c(u)c(v)}$, kjer je $b(uv)$ standardna povezavna vmesnost, $c(u)$ pa uravnana vozliščna vmesnost. V tej alternativni definiciji je pomembnost povezave normalizirana glede na pomembnost njenih krajišč. To da boljšo predstavitev “lokalne” pomembnosti povezave, tj. njene pomembnosti v bližnji okolici. Podamo natančne spodnje in zgornje meje za to invarianto skupaj s karakterizacijo grafov, ki dosežejo te meje. Poleg tega obravnavamo meje za različne zanimive družine grafov, navedemo pa tudi nekaj odprtih problemov.

Ključne besede: Vmesnost, družbena omrežja.

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