

# Scholarly Paper Impact

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## Source

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Based on the observation that citations are inversely related to the geographical distance following an exponential distribution, the impact of each scholarly paper is defined as its average higher-order weighted quantum PageRank value:

$$S(P_i) = \langle P_{i,m} \rangle := \frac{1}{M} \sum_{m=1}^M P_{i,m}$$

where  $S(P_i)$  represents the prestige score of a scholarly paper,  $\langle P_{i,m} \rangle$  represents the average value of higher-order weighted quantum PageRank scores,  $M$  represents the iteration number of the algorithm, and  $P_{i,m}$  indicates the  $m$ -th value of higher-order weighted quantum PageRank scores. The concept of the prestige score is inherited from Quantum Google algorithm<sup>1</sup>, with the importance of a node corresponds to the prestige score of a scholarly paper in our work.

<sup>1</sup> Paparo GD, Müller M, Comellas F, Martin-Delgado MA. Quantum Google algorithm. The European Physical Journal Plus. 2014;129(7):1–16.