

# Design Of An Efficient Search Algorithm For P2P Networks Using Concepts From Natural Immune Systems?

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Abstract. In this paper we report a novel and efficient algorithm for searching p2p networks. The algorithm, termed ImmuneSearch, draws its basic inspiration from natural immune systems. It is implemented independently by each individual peer participating in the network and is totally decentralized in nature. ImmuneSearch avoids query message flooding; instead it uses an immune systems inspired concept of affinity governed proliferation and mutation for message movement. In addition, a protocol is formulated to change the neighborhoods of the peers based upon their proximity with the queried item. This results in topology evolution of the network whereby similar contents cluster together. The topology evolution coupled with proliferation and mutation help the p2p network to develop 'memory', as a result of which the search efficiency of the network improves as more and more individual peers perform search. Moreover, the algorithm is extremely robust and its performance is stable in face of the transient nature of the constituent peers.