**Influential Node Tracking on Dynamic Social Network: An Interchange Greedy Approach**

**Abstract**

As both social network structure and strength of influence between individuals evolve constantly, it requires to track the influential nodes under a dynamic setting. To address this problem, we explore the Influential Node Tracking (INT) problem as an extension to the traditional Influence Maximization problem (IM) under dynamic social networks. While Influence Maximization problem aims at identifying a set of k nodes to maximize the joint influence under one static network, INT problem focuses on tracking a set of influential nodes that keeps maximizing the influence as the network evolves. Utilizing the smoothness of the evolution of the network structure, we propose an efficient algorithm, Upper Bound Interchange Greedy (UBI) and a variant, UBI+. Instead of constructing the seed set from the ground, we start from the influential seed set we find previously and implement node replacement to improve the influence coverage. Furthermore, by using a fast update method by calculating the marginal gain of nodes, our algorithm can scale to dynamic social networks with millions of nodes. Empirical experiments on three real large-scale dynamic social networks show that our UBI and its variants, UBI+ achieves better performance in terms of both influence coverage and running time.