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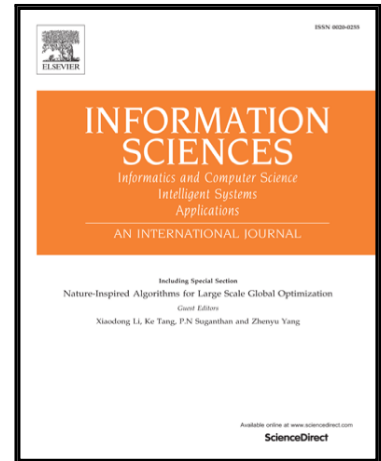
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## Nearest Close Friend Search in Geo-Social Networks

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### Abstract

The proliferation of GPS-enabled devices has led to the development of location-based social network services such as Facebook, Twitter, and Foursquare. Users of these services not only make new friends but also post various content that contains their location. Although the existing services have continued to improve, they are still weak in handling some situations. If some users want to make a new friend, for example, they could manually search for the potential friends among the acquaintances of their friends by considering both spatial proximity and social closeness one by one. However, conventional studies have insufficiently tackled this problem yet.

In this paper, we define a novel type of geo-social query called the *k-Nearest  $\ell$ -Close Friends* query, which retrieves the  $k$  nearest data objects from among the  $\ell$ -hop friends of the query user. We also propose three approaches for processing a *k $\ell$ -NCF* query: *Neighboring Cell Search*, *Friend-Cell Search*, and *Personal-Cell Search*. In addition, we develop an efficient method of index update for supporting dynamic environments. We conduct a variety of experiments on synthetic and real data sets to evaluate and compare our methods.

*Keywords:* Geo-social networks, Location-based services, Nearest close friends query, Spatial databases

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