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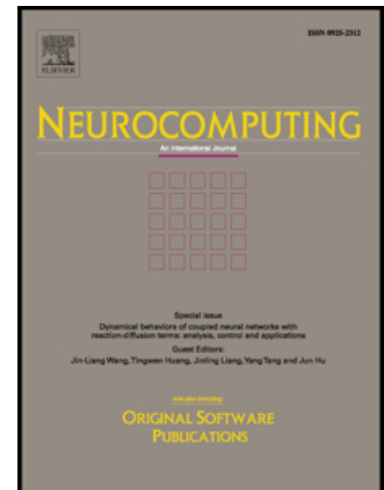
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Relationship strength estimation based on Wechat Friends Circle

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Abstract: Wechat has become a popular way in China for users to connect and share information with their friends. In particular, Wechat Friends Circle is a popular platform for users to express themselves. It is useful in many real applications, such as personalized recommendations, to calculate the relationship strength between Friends Circle users. However, most existed researches do not apply to the Wechat Friends Circle due to the uniqueness that users can only see a common friend's comments or point praise, which is quite different from the general social network. To meet this need, in this paper we propose a general framework to measure the relationship strengths between different users in Wechat Friends Circle, considering not only the similarity of users' profile information, but also the interaction between users. We conduct a set of experiments on Friends Circle dataset, from which we learn that the proposed framework is efficient and promising on improving the performances of relationship strength calculation.

Keywords: Wechat Friends Circle; Relationship circle; Semantic similarity; Interaction frequency; Relationship strength

1. Introduction

Granovetter [1] first proposed the concept of relationship strength in his landmark paper *The Strength of Weak Ties*. The relationship strength indicates the closeness between different individuals. Compared to the acquaintances, individuals are more likely to contact with their relatives and friends, which is considered to be the strong relationship. The relationship between acquaintances may be weak, but these weak ties often play a significant role in many new message transfer processes.

The Online Social Networks, such as Facebook, Myspace and Twitter, are rapidly becoming popular with the rapid development of Internet technology and wireless communication technology. This phenomenon makes information dissemination and sharing more convenient, and it gradually extends to the information services of social networking sites, to provide users with richer services than the traditional ways [22]. However, the explosive growth of the content type of service and information has led to the problem of information overload. People need to spend a lot of time and effort finding the information they need from the vast amount of information database, which greatly reduces the efficiency. Furthermore, in real life, acquaintances and friends recommendations are of vital importance to promote the social networks users' consumption behavior [2]. If relating the social network user relationship strength to personalized services, can accurately recommend and show users their real interested social service content and information, and greatly improves the efficiency of information retrieval [3]. Therefore, in recent years, the relationship strength between users in online social networks and related content have become a hot research topic, and the accurate calculation of

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