

Title: Phonebook-centric social networks - dealing with similarities

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The popularity of social networks is increasing rapidly. The capabilities of mobile phones enable them to participate in social network applications. In addition to the relations between the users of the social network, the phonebooks in the mobile phones also define social relations. The key idea behind *Phonebook-centric social networks* is that Phonebook-centric social networks also provide a synchronization mechanism between phonebooks of users and the social network. Similarities appear in the system when a contact in a phonebook is similar to a member of the social network. The load and the scalability of the system mainly depend on the number of similarities. By analyzing the data of the phonebook-centric social network implementation *Phonebookmark* we experience that the distribution of in- and out-degrees and of the similarities follow a power law. Based on these facts we propose a model, how to estimate the total number of similarities. We verify the accuracy of our estimation empirically and theoretically. For the empirical test we use the data of *Phonebookmark* collected during a time period of eight months. Finally, we prove an $O(N_M)$ upper bound on the total number of similarities, with high probability, i.e. with probability $1 - O(N_M^{-\gamma})$, where $\gamma > 1$ is an arbitrarily chosen constant and N_M is the number of members of the network.

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