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PEOPLE SEARCHING USING SOCIAL DOMAINS

ABSTRACT

Configurations of the subject technology provide receiving a search query for one or more users who are socially connected to a specified social domain. One or more users are then identified who match the search query and who are connected to the specified social domain. The subject technology ranks the identified users according to their connection to the specified social domain, and provides information about the identified users according to their respective ranking. Further, the users may be grouped according to their connection to the specified social domain.

PROBLEM STATEMENT

People sometimes have only partial information when trying to search for other people on social networks. For example, someone might want to search for another person they met based on only a first name. Such searches often return too many results to be useful. An advanced method and system for searching people on search domains is described.

DETAILED DESCRIPTION

In the following detailed description, numerous specific details are set forth to provide a full understanding of the present disclosure. Although certain examples provided herein describe a user's information (e.g., interactions with other users and domains of those interactions) being stored in memory, in some aspects, the user may delete the user information from memory and/or opt out of having the user information stored in memory. In example aspects, the user may adjust appropriate settings to selectively limit the types of user information stored in memory, or select the memory in which the user information is stored (e.g., locally on the user's device as opposed to remotely a server). In example aspects, the user information may not include and/or share the specific identification of the user (e.g., the user's name) unless otherwise specifically provided or directed by the user.

According to some aspects of the subject technology, a social domain is an area or topic that provides a context for social interactions between users. Examples of social domains include but are not limited to social activities (e.g., dancing, skiing, or the like), groups (e.g.,

dancers, skiers, or the like), interests, events, and sites (e.g., websites focused on discussions about dancing, skiing, or the like). Social domains can be identified by topic keywords or phrases, descriptions of social activities, names of user-groups, internet domains (e.g., websites) focused on or related to a particular social activity, or any other characterization of a context for social interactions. As an illustration, one or more users may be included in a respective social domain to indicate an association with an interest (e.g., pets), social activity (e.g., dancing), or event (e.g., holiday party), or any of the aforementioned contexts for social interactions between users.

The subject technology provides, for example on a social network web page, an input for a search query directed to find users based on their connection to a social domain. A first user may search for a second user by inputting a partial name (for example, a first name) and a specification of the social domain. On receiving the search query, the subject technology may search a user database to identify users who are directly or indirectly connected to the specified social domain. In some aspects, the user database contains information about users within the online social network.

In some aspects, a connection to the social domain can be through an identification of interest in the social domain, membership in the social domain, or association with users of a user-group connected to the identified social domain (for example, friends of a user in an identified social group or friends of those friends). Determining that a user is connected to a social domain can include determining that the user affirmatively associated with, or approved of content related to, the social domain, was previously assigned to a user-group pertaining to the social domain, visited one or more websites associated with the social domain (for example, using a link within the social network), or the like. In some aspects, a user may be identified as having a potential interest in the social domain if one or more friends of that user (for example, a predetermined number of friends) are connected to the social domain. By way of example, a first user searches for a second user that may have a potential interest in the social domain. In this regard, the subject technology may perform a search query for a set of users possibly matching the second user in which the set of users are directly connected to one or more users that are included in a specified social domain (e.g., dancing), but the set of users are not explicitly included in the specified social domain. Thus, the subject technology provides querying for the second user(s) that is not directly connected to the first user via the specified social domain.

Certain aspects of the subject technology include ranking identified users according their degree of separation from an identified social domain and/or an intensity of their interest in a specified social domain. For example, users may be ranked using each of the previously described criteria, further weighted according to each criteria's importance to the user or another user, or by a predetermined weighting scale. For example, a higher ranking may be assigned to those users who have affirmatively associated themselves with the specified social domain than to users who have merely read or approved of a news article related to the specified social domain. However, users who frequently read or approve of news articles related to the specified social domain may be considered to have a higher rank than those who rarely indicate an affirmative interest other than merely associating with the social domain by way of joining or being placed in a related user-created group. Users who are friends or direct contacts of users who are in an identified social group, or have indicated an interest in, the specified social domain may also be included in a search result but may be ranked lower. Friends of those friends (or direct contacts of those contacts) and so on may also be included but may be ranked even lower.

Some aspect of the subject technology automatically assign the identified users to one or more groups corresponding to their respective relationships with the social domain (for example, members of a social group, friends of members, friends of those friends, and the like). Various combinations of ranking and grouping can be performed in some aspects, or ranking and grouping can be skipped. Information about the users is provided for display, for example arranged according to assigned groups, rankings, or both. The provided information is, for example, full names or other identifying information about the identified users.

FIG. 1 is an illustration of example connections between users that can be used to perform a search according to some aspects of the disclosure. User 100 is shown interacting with webpage 102 to access an online social network. The user has submitted query 104 to search for another user. In some aspects, the query is a full or partial name for the other user or some identifying characteristic of the other user. User 100 or the online social network has also specified identification 105 of social domain 106 for the query.

Social domain 106 includes multiple users in **FIG. 1**. Some of these users in turn belong to various user-groups. Examples of various relationships between users in social domain 106 and these user-groups are illustrated in **FIG. 1**. User-groups 112, 114, and 116 include users in social domain 106 and other users. User-group 118 shares a member with user-group 116. User-

group 120 includes a member who also belongs to user-group 122. The other users in user-group 122 do not belong to user-group 120 or social domain 106. User-group 124 includes a subset of the users in user-group 126.

Each of the users shown in the user-groups is connected to social domain 106, either directly or indirectly. Various ones of these and other types of connections to a social domain can be applied to a search according to aspects of the subject technology. Users surrounded by circles in **FIG. 1** match a search based on query 104. Thus, user 132 in user-group 112, user 134 in user-group 114, user 136 in user-groups 116 and 118, user 142 in user-group 122, and user 146 in user-group 126 match the query. The users have varying degrees of connection with social domain 106. User 132 is in a user-group that includes a user in the social domain. User 134 actually is included in social domain 106. User 136 is in two user-groups that include a user in the social domain. User 142 is in user-group 122, which does not include any users in the social domain. However, user-group 122 shares a user with user-group 120, which includes a user in the social domain. User 146 is in a user-group that both includes a user in the social domain and includes a smaller user-group.

The various levels of connection can be processed to rank or group the users who match the query according to certain aspects of the disclosure. For example, user 136 can be ranked as closely associated with the social domain, user 132 can be ranked as just as closely related or less closely related, user 146 can be ranked as less closely related, and user 142 can be ranked as only somewhat related. Various scoring, set theory, or statistical techniques can be applied to quantify the rankings. For another example, the different types of connections could be processed to divide the users who match the query into different groups.

FIG. 2 is a flowchart of an example method for performing a search for users utilizing social domains according to some aspects of the disclosure. A search query is received in step 210. People who match the search query are identified in step 220. Flow is directed by step 230 based on whether a social domain for the search is specified. For a first example, the search query can include a social domain. For a second example, a user can indicate that searches for people should focus on the user's social domain(s). If a social domain is specified, flow is directed to step 240.

In step 240, the identified people's connection to the specified social domain is determined. Flow is directed by step 250 based on whether the identified people are to be ranked

252, grouped 254, or both ranked and grouped 256 according to their connection to the specified social domain. The identified people who matched the search query are provided for display according to their ranking or grouping in step 260. The ranking or grouping can limit the scope of the search results according to some aspects of the subject technology. The degree that the search results are limited can be determined by user-defined or system-defined parameters. For example, the parameters can specify that the ranking or grouping limit the people provided for display in step 260 to only those people with a sufficiently high ranking or grouped within a certain closeness to the specified social domain.

An option may be provided for a user to indicate that the search should be broadened. In some aspects, a search is automatically broadened if the search results include too few people. If the search is to be broadened, flow is directed from step 270 to step 280. In that step, parameters describing how the scope of the search results was limited by the ranking or grouping are modified to be less limiting. Flow then proceeds back to step 250 for further ranking or grouping and other processing using the broader parameters. If the search is not to be broadened, flow is directed by step 270 to step 290, where the example method ends.

If a social domain was not specified for the search, step 230 directs flow to step 235. In that step, the people identified in step 220 as matching the search query are provided for display before flow ends in step 290.

FIG. 3 is a flowchart of another example method for performing a search for users utilizing social domains according to some aspects of the disclosure. A search query is received in step 310. Flow is directed by step 320 based on whether a social domain for the search is specified. For a first example, the search query can include a social domain. For a second example, a user can indicate that searches for people should always focus on the user's social domain(s). If a social domain is specified, flow is directed to step 330.

In step 330, people with a connection to the specified social domain are identified. The identified people can be limited in scope to only people with a sufficiently close relationship to the social domain. The degree to which the identified people are limited in scope can be determined by user-defined or system-defined parameters, for example specifying a degree of maximum separation from the specified social domain. In step 340, a search of the identified people is performed for those who match the search query. Flow is directed by step 350 based on whether the identified people are to be ranked 352, grouped 354, or both ranked and grouped

356 according to their connection to the specified social domain. The identified people who matched the search query are provided for display according to their ranking or grouping in step 360.

An option may be provided for a user to indicate that the search should be broadened. In some aspects, a search is automatically broadened if the search results include too few people. If the search is to be broadened, flow is directed by step 370 to step 380, where people are identified who are more indirectly connected to the specified social domain than those identified in step 330. For instance, the subject technology may broaden the search by searching for a set of users in which the set of users are directly connected to one or more users that are included in the specified social domain, but the set of users are not explicitly included in the specified social domain. Thus, the subject technology provides searching for a set of users that are not directly connected via the specified social domain. Flow then proceeds back to step 340 for further processing with the broader scope of people. If the search is not to be broadened, flow is directed by step 370 to step 390, where the example method ends.

If a social domain was not specified for the search, step 320 directs flow to step 324. In that step, a search is performed for people who match the query (i.e., without regard to social domains). Those people are provided for display in step 328 before the example method ends in step 390.

The example methods shown in **FIGS. 2** and **3** differ in how a specified social domain is applied to a search. In the example method in **FIG. 2**, people's relative closeness to a social domain is used to limit the results of a search. In the example method of **FIG. 3**, people's relative closeness to a social domain is used to limit the scope of people searched. A specified social domain can be applied to a search in other ways as well. For example, searching can be performed simultaneously for matches to a query and closeness to a social domain. **FIG. 4** illustrates an example of this approach.

In **FIG. 4**, a search query is received in step 410. Flow is directed by step 420 based on whether a social domain for the search is specified. For a first example, the search query can include a social domain. For a second example, a user can indicate that searches for people should always focus on the user's social domain(s). If a social domain is specified, flow is directed to step 430.

In step 430, people who match the query and have a connection to the specified social domain are identified. The identified people can be limited in scope to only people with a sufficiently close relationship to the social domain. The degree to which the identified people are limited in scope can be determined by user-defined or system-defined parameters, for example specifying a degree of maximum separation from the specified social domain. Flow is directed by step 450 based on whether the identified people are to be ranked 452, grouped 454, or both ranked and grouped 456 according to their connection to the specified social domain. The identified people who matched the search query are provided for display according to their ranking or grouping in step 460.

An option may be provided for a user to indicate that the search should be broadened. In some aspects, a search is automatically broadened if the search results include too few people. If the search is to be broadened, flow is directed by step 470 back to step 430 for further searching, for example of additional data sources or for people with a less direct connection to the specified social domain. If the search is not to be broadened, flow is directed by step 470 to step 490, where the example method ends.

If a social domain was not specified for the search, step 420 directs flow to step 424. In that step, a search is performed for people who match the query (i.e., without regard to social domains). Those people are provided for display in step 428 before the example method ends in step 490.

FIG. 5 illustrates an example of architecture 500 used to search for users utilizing social domains according to certain aspects of the disclosure. The architecture 500 includes servers 530 and clients 510 connected over a network 550. One of the many servers 530 is configured to host instructions and data, including without limitation user information, social domain information, and instructions for searching for users according to some aspects of the disclosure. Alternatively, multiple servers 530 can host these data and instructions (or portions thereof) for purposes of load balancing, or one of the many clients can execute the instruction without the assistance of a server.

Clients 510 and servers 530 can be any computing devices having processing hardware, memory, and communications capability necessary to perform some or all of the operations disclosed herein. Clients 510 to which servers 530 are connected over the network 550 can be, for example, desktop computers, mobile computers, tablet computers (e.g., including e-book

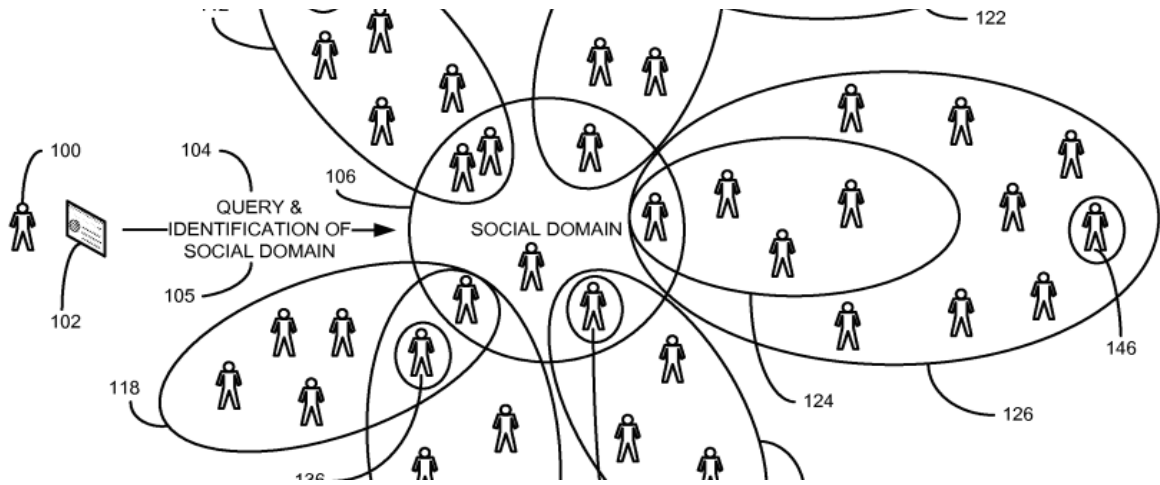
readers), mobile devices (e.g., a smartphones or personal digital assistants), set top boxes (e.g., for a television with one or more processors coupled thereto and/or embedded therein), video game consoles, or any other devices having memory, processing hardware, and communications capabilities for searching for users according to certain aspects of this disclosure.

The network 550 can include, for example, any one or more of a personal area network (PAN), a local area network (LAN), a campus area network (CAN), a metropolitan area network (MAN), a wide area network (WAN), a broadband network (BBN), a peer-to-peer network, an ad-hoc network, a mobile phone network, the Internet, and the like. Further, the network can include, but is not limited to, any one or more network topologies such as a bus network, a star network, a ring network, a mesh network, a star-bus network, tree or hierarchical network, and the like.

FIG. 6 is a block diagram 600 illustrating examples of client 510 and server 530 in architecture 500 of **FIG. 5** according to certain aspects of the disclosure. Client 510 and server 530 are connected over the network 550 via respective communications modules 612 and 632. Communications modules 612 and 632 are configured to interface with network 550 to send and receive information, such as data, requests, responses, and commands, to other devices on the network. Communications modules 612 and 632 can be, for example, wireless transceivers, modems or Ethernet cards.

Both client 510 and server 530 can include processing hardware and some form of memory. In **FIG. 6**, client 510 includes processor 614 and memory 616, and server 530 includes processor 634 and memory 636. Memory 616 and 636 can be volatile or non-volatile memory. Client 510 also can include input device 617 and output device 618 for accepting input from and providing output to a user. Server 530 also can include such input and output devices.

DRAWINGS



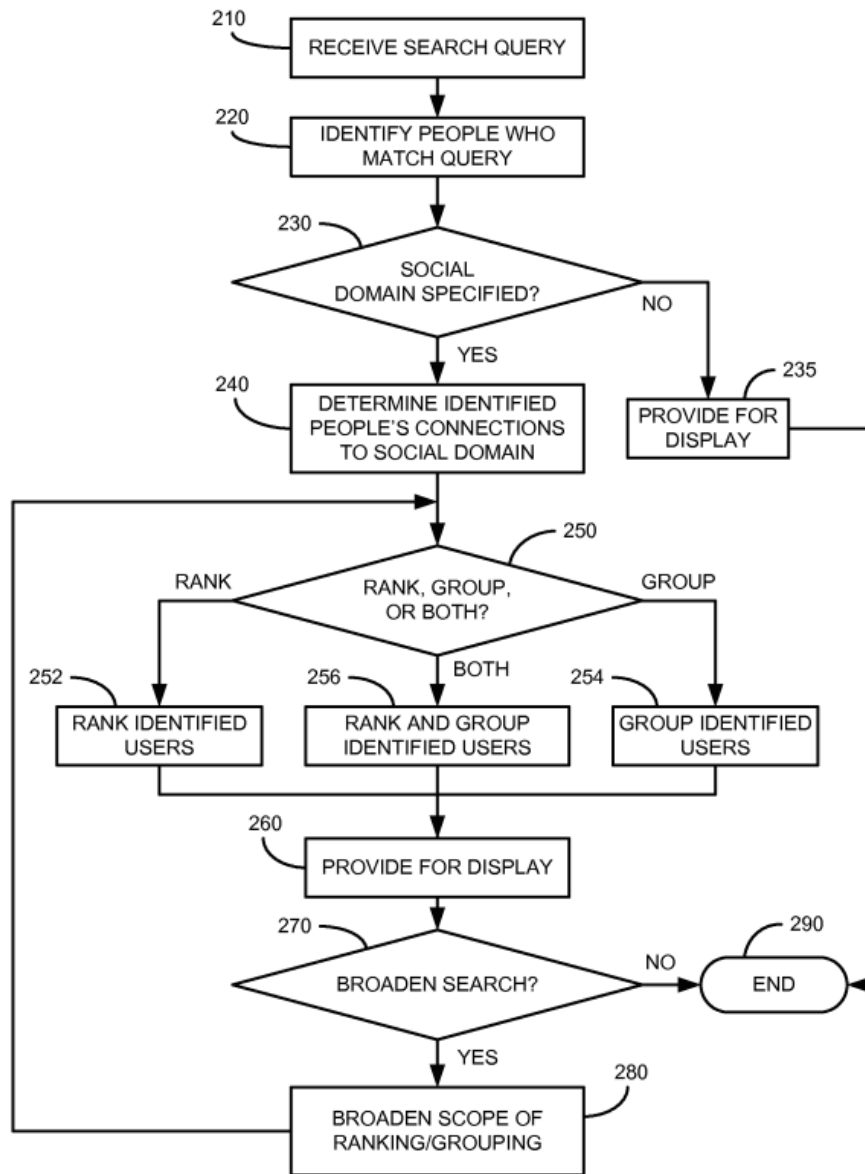


FIG. 2

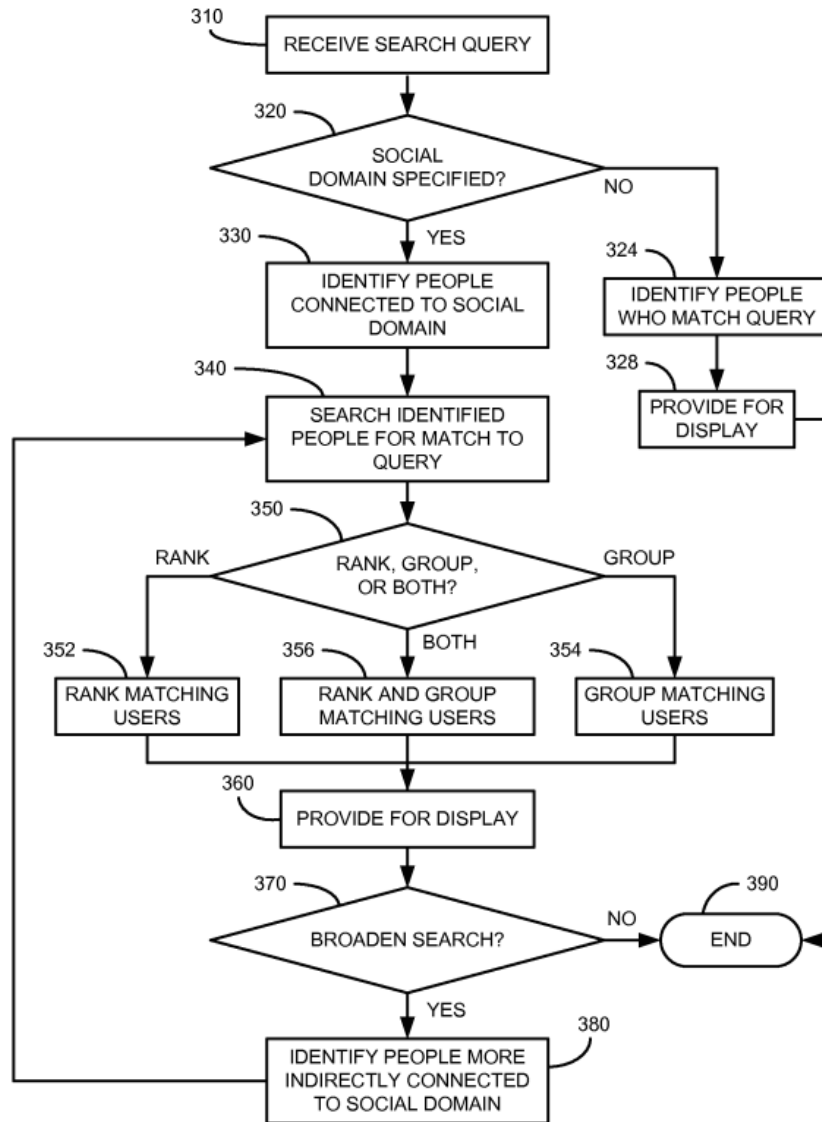


FIG. 3

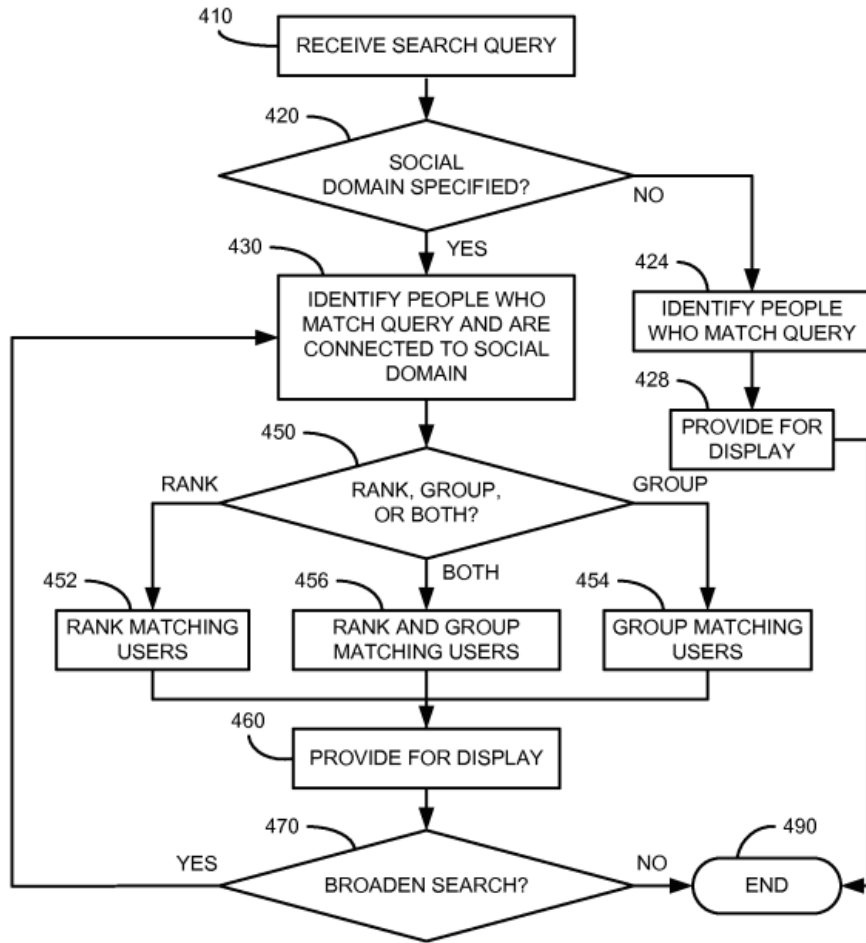


FIG. 4

