METHOD AND APPARATUS FOR VERIFYING ENTITY INFORMATION

TECHNICAL FIELD

[0001] The present application relates to the field of computer technologies, and in particular, to a method and apparatus for verifying entity information.

BACKGROUND

[0002] With the development of the Internet, increasingly more services can be implemented by using the Internet, for example, electronic commerce, social networking, or even banking services. In view of authenticity and security, users usually need to upload some entity information for entity verification. For example, the entity information can include location information, name information, real scene images, etc. For example, verify entity information of a physical store that is provided by a merchant, and verify entity information of a company that is provided by a user.

[0003] In the existing technology, location information and real scene images in entity information are usually verified through human review, for example, manually review location information and store images of a physical store that are provided by a merchant. For another example, manually review location information and company images of a company that are provided by a user.

[0004] However, in the real world, location information and real scene images are complex and variable, authenticity of location information and real scene images of each entity cannot be verified one by one through human review, and verification can only be subjectively performed based on experience. In addition, forgery of location information and real scene images is very simple, which causes great interference to human review. Therefore, the solution in the existing technology that entity information is verified through human review based on a combination of location information and real scene images is characterized by very low accuracy. In addition, human review is limited by working hours and manpower, and it is difficult to continuously guarantee timeliness.

SUMMARY

[0005] An implementation of the present application provides a method for verifying entity information, to improve accuracy of verifying entity information.

[0006] An implementation of the present application provides an apparatus for verifying entity information, to improve accuracy of verifying entity information.

[0007] The following technical solutions are used in implementations of the present application.

[0008] In one aspect, the present application refers to a method for verifying entity information includes: determining location information in entity information sent by a user; determining, based on the location information, a candidate entity set whose location relationship with the entity satisfies a predetermined condition, where the candidate entity set does not include the entity; and verifying the entity information based on a result of determining, by the user, candidate entity information corresponding to the candidate entity set under a predetermined verification condition, wherein the verifying the entity information based on a result of determining, by the user, candidate entity information corresponding to the candidate entity set under a predetermined verification condition includes: sending the predetermined verification condition to the user; receiving a result of selection performed by the user in the candidate entity set; and verifying the entity information based on the selection result.

[0009] In another aspect, the present application refers to an apparatus for verifying entity information includes a first determining unit, a second determining unit, and a verification unit, where the first determining unit is configured to determine location information in entity information sent by a user; the second determining unit is configured to determine, based on the location information, a candidate entity set whose location relationship with the entity satisfies a predetermined condition, where the candidate entity set does not include the entity; and the verification unit is configured to verify the entity information based on a result of determining, by the user, candidate entity information corresponding to the candidate entity set under a predetermined verification condition, wherein the verification unit is configured to: send the predetermined verification condition to the user; receive a result of selection performed by the user in the candidate entity set; and verify the entity information based on the selection result.

[0010] The at least one technical solution used in the implementations of the present application can achieve the following beneficial effects: The candidate entity set whose location relationship with the entity satisfies the predetermined condition and that does not include the entity is determined based on the location information in the entity information sent by the user, and verification is performed based on the result of determining, by the user, the candidate entity information corresponding to the candidate entity set under the predetermined verification condition. For a problem in the existing technology that verification accuracy is relatively low because authenticity of entity information is subjectively determined through human review, in the present solution, the entity is bypassed, and authenticity of the entity is objectively

verified based on user's knowledge of an environment around the entity, thereby improving verification accuracy. In addition, by using the present solution, human review interventions can be reduced or even avoided, thereby improving timeliness of a verification process.

BRIEF DESCRIPTION OF DRAWINGS

[0011] The accompanying drawings described here are intended to provide a further understanding of the present application, and constitute a part of the present application. The illustrative implementations of the present application and descriptions thereof are intended to describe the present application, and do not constitute limitations on the present application. In the accompanying drawings:

[0012] FIG. 1 is a schematic flowchart illustrating a method for verifying entity information, according to Implementation 1 of the present application;

[0013] FIG. 2 is a schematic flowchart illustrating a method for verifying entity information, according to Implementation 2 of the present application;

[0014] FIG. 3 is a schematic flowchart illustrating a method for verifying a physical store, according to Implementation 3 of the present application;

[0015] FIG. 4 is a schematic diagram illustrating a geographic location of a physical store, according to Implementation 3 of the present application;

[0016] FIG. 5 is a schematic diagram illustrating determining a candidate physical store based on a proximity condition, according to Implementation 3 of the present application;

[0017] FIG. 6 is a schematic diagram illustrating a selection interface, according to Implementation 3 of the present application; and

[0018] FIG. 7 is a structural diagram of an apparatus for verifying entity information, according to Implementation 4 of the present application.

DESCRIPTION OF IMPLEMENTATIONS

[0019] To make the objectives, technical solutions, and advantages of the present application clearer, the following clearly and comprehensively describes the technical solutions of the present application with reference to specific implementations and accompanying drawings of the present application. Apparently, the described

implementations are merely some rather than all of the implementations of the present application. All other implementations obtained by a person of ordinary skill in the art based on the implementations of the present application without creative efforts shall fall within the protection scope of the present application.

[0020] The technical solutions provided in the implementations of the present application are described in detail below with reference to the accompanying drawings.

[0021] Implementation 1

[0022] As described above, in the existing technology, location information and real scene images in entity information are usually verified through human review. For example, a merchant provides location information (e.g., "No. XX XX street") of a physical store and store images (e.g., facade photos of the store, and photos of decoration and layout in the store). It's impossible for reviewers to verify each piece of entity information on the spot. Most of the reviewers subjectively determine authenticity of the information based on experience, and there is no standard to determine authenticity. In addition, with the development of computer software, forgery of location information and real scene images is very simple. Therefore, based on the previous description, accuracy of human review is very low. In addition, human review is limited by working hours and manpower, and it is difficult to guarantee timeliness. Based on the previous defects, an implementation of the present application provides a method for verifying entity information, to improve accuracy of verifying entity information. As shown in FIG. 1, the method includes the following steps:

[0023] Step 11: Determine location information in entity information sent by a user.

[0024] The entity can be a real object in reality. For example, verification of the entity information in the present application is actually determining whether the entity really exists in reality. In an Internet service, during verification of entity information, whether a physical store of a merchant really exists can be verified, and whether a working place of a user really exists can be verified. Therefore, the entity mentioned here can be a physical store, a working place, etc.

[0025] As described above, the entity information can include location information, name information, real scene images, etc. For example, for a physical store, the location information can be a geographic location, the name information can

be a name of the store, and the real scene images can be facade photos of the store, photos of decoration and layout in the store, etc.

[0026] When the entity information sent by the user needs to be verified, the entity information sent by the user can be received, and the location information in the entity information is determined, for example, No. XX XX street. In practice, coordinate information (e.g., "Nxxxx, Exxxx") sent by a user by using a terminal device can also be received. Specifically, the coordinate information can be sent by using a Global Positioning System (GPS), a BeiDou Navigation Satellite System, etc.

[0027] For ease of description, the entity in the present implementation can be referred to as an entity that is to be verified, to be specific, an entity that is not successfully verified.

[0028] Step 12: Determine, based on the location information, a candidate entity set whose location relationship with the entity satisfies a predetermined condition.

[0029] In the existing technology, entity information of an entity that is to be verified is directly verified. Because whether the entity that is to be verified exists cannot be determined, it is difficult to determine authenticity of the entity that is to be verified if verification is not performed on the spot. However, through study, the inventor finds that the entity is relatively fixed, for example, a geographic location of a physical store, a geographic location of a working place, and a geographic location of a public place, and a probability of frequent migration is very small. Therefore, if the entity really exists, a merchant (user) is not only familiar with the entity in which the merchant (user) is located, but also familiar with a nearby entity. Therefore, when authenticity of the entity that is to be verified cannot be determined, the information about the entity that is to be verified can be verified by using the entity near the entity that is to be verified. However, the merchant (the user) is relatively familiar with the nearby entity, but is unfamiliar with an entity that is far away from the entity that is to be verified. Therefore, the information about the entity that is to be verified can also be verified by using the entity that is far away from the entity that is to be verified.

[0030] Therefore, based on the previous analysis, in the present step, an entity that has a specific relationship with a location of the entity that is to be verified can be determined based on the location information of the entity that is to be verified, and verification is performed based on user's knowledge of these entities. To be specific, in the present step, the candidate entity set whose location relationship with the entity satisfies the predetermined condition can be determined. A specific predetermined

condition can be that a candidate entity is close to the entity that is to be verified (where a proximity condition is satisfied), or a candidate entity is far away from the entity that is to be verified (where a non-proximity condition is satisfied). Whether the proximity condition is satisfied can be filtered by using a predetermined distance threshold. Whether the non-proximity condition is satisfied can be filtered by using a predetermined distance threshold, and also can be filtered based on area division at a geographic location. For example, if the predetermined condition is "less than 200 meters", in the present step, an entity whose distance from the entity that is to be verified is less than 200 meters can be identified based on the location information of the entity that is to be verified, and the entity is determined as a candidate entity set. In practice, because determining a large quantity of entities is of little meaning, a quantity such as three or four can be usually predetermined. For example, three entities are selected from all entities that satisfy a predetermined condition to form a candidate entity set.

[0031] As described above, the information about the entity that is to be verified can be verified by using the entity near the entity that is to be verified, and also can be verified by using the entity far away from the entity that is to be verified. In an implementation, the present step can include the following: determining, based on the location information, a first entity set whose location relationship with the entity satisfies the proximity condition, and/or determining, based on the location information, a second entity set whose location relationship with the entity satisfies the non-proximity condition; and determining the first entity set and/or the second entity set as the candidate entity set. That is, the candidate entity set can include only an entity that is close to the entity that is to be verified, or can include only an entity that is far away from the entity that is to be verified, or can include both an entity that is close to the entity that is to be verified and an entity that is far away from the entity that is to be verified. Considering that the user is more familiar with an environment near the entity than an environment far away from the entity, verification performed on the entity by using the first entity set whose location relationship with the entity satisfies the proximity condition is more effective. Therefore, in an implementation, the candidate entity set includes at least the first entity set.

[0032] As mentioned above, the information about the entity that is to be verified can be verified by using the entity near the entity that is to be verified. Therefore, when determining the candidate entity set whose location relationship with the entity

satisfies the predetermined condition in the present step, the candidate entity set may not include the entity that is to be verified.

[0033] It is worthwhile to note that in the present step, a determined candidate entity needs to have relatively high authenticity, for example, the determined candidate entity can be a well-known entity (e.g., a large shopping mall, a shopping center, or a chain's physical store). That is to say, authenticity of the candidate entity indirectly determines, to some extent, authenticity of the information about the entity that is to be verified.

[0034] Step 13: Verify the entity information based on a result of determining, by the user, candidate entity information corresponding to the candidate entity set under a predetermined verification condition.

[0035] In the previous step, the candidate entity set is determined, and the set does not include the entity that is to be verified. Therefore, in this case, the candidate entity information corresponding to the candidate entity set can be provided for the user, and the predetermined verification condition is also provided for the user. The information about the entity that is to be verified is verified based on the result of determining, by the user, the candidate entity information under the predetermined verification condition.

[0036] For example, the candidate entity set determined in step 12 includes three entities that satisfy the proximity condition and five entities that satisfy the non-proximity condition. Candidate entity information corresponding to the eight candidate entities can be sent to the user together (or one by one), together with a verification condition of "selecting a nearby entity". Afterwards, a result of a candidate entity selection performed by the user can be obtained. If three entities selected by the user are the same as the three entities that satisfy the proximity condition, the verification succeeds. Alternatively, the candidate entity information corresponding to the eight candidate entities can be sent to the user one by one, together with a verification condition of "selecting a farther entity". Afterwards, a result of determining by the user for a candidate entity can be obtained. If "farther entities" determined by the user are the same as any three of the five entities that satisfy the non-proximity condition (in other words, a correctness percentage exceeds 50%), the verification succeeds.

[0037] According to the method provided in Implementation 1, the candidate entity set whose location relationship with the entity satisfies the predetermined

condition and that does not include the entity is determined based on the location information in the entity information sent by the user, and the entity is verified based on the result of determining, by the user, the candidate entity information corresponding to the candidate entity set under the predetermined verification condition. For a problem in the existing technology that verification accuracy is relatively low because authenticity of entity information is subjectively determined through human review, in the present solution, the entity is bypassed, and authenticity of the entity is objectively verified based on user's knowledge of an environment around the entity, thereby improving verification accuracy. In addition, by using the present solution, human review interventions can be reduced or even avoided, thereby improving timeliness of a verification process.

[0038] Implementation 2

[0039] Based on the same inventive concept as Implementation 1, the present application is described in more detail here, to provide a method for verifying entity information in an implementation of the present application, so as to improve accuracy of verifying entity information. As shown in FIG. 2, the method includes the following steps:

[0040] Step 21: Determine location information in entity information sent by a user.

[0041] The present step is similar to step 11 in Implementation 1. Details are omitted for simplicity.

[0042] Step 22: Determine, based on the location information, a first entity set whose location relationship with the entity satisfies a proximity condition, and determine the first entity set as a candidate entity set.

[0043] In description of step 12 in Implementation 1, it has been mentioned that, considering that the user is more familiar with an environment near the entity (that is to be verified) than an environment far away from the entity, verification performed on the entity by using the first entity set whose location relationship with the entity satisfies the proximity condition is more effective. Therefore, in the present step, the first entity set whose location relationship with the entity satisfies the proximity condition can be determined based on the location information, and then the first entity set is directly determined as the candidate entity set. To be specific, location relationships between entities in the candidate entity set and the entity that is to be verified all satisfy the proximity condition, in other words, the candidate entities are

all near the entity that is to be verified. For example, the proximity condition can be set to that an entity is within a circular range in which the location information is a center and a radius is a predetermined first threshold. Specifically, for example, the first threshold can be 200 meters. In this case, the entities in the determined candidate entity set are all within a circular range in which the entity is a center and a radius is 200 meters.

[0044] As mentioned in step 12, the determined candidate entity needs to have relatively high authenticity. Therefore, the first entity set (the candidate entity set) in the present step also needs to have relatively high authenticity. A quantity of entities in the candidate entity set can be predetermined, but the candidate entity set needs to have a specific quantity of entities, for example, three entities to eight entities. In practice, if there are less than two first entities that satisfy the proximity condition, human review can be performed, or increase the predetermined first threshold, for example, the first threshold is increased from 200 meters to 500 meters, to satisfy a requirement for the first entity set. The first entity set may not include the entity that is to be verified.

[0045] Step 23: Send the proximity condition to the user.

[0046] To obtain a result of determining, by the user, each entity in the candidate entity set, a predetermined verification condition can be first provided for the user, for example, the user needs to select nearby entities, and therefore, the proximity condition can be sent to the user. For example, the proximity condition is "within 200 meters".

[0047] Step 24: Receive a result of selection performed by the user in the candidate entity set.

[0048] In practice, candidate entity information corresponding to the candidate entity set can be sent to the user together with the verification condition in step 23, and a corresponding operation interface is set, so that the user can perform selection, and the result of selection performed by the user in the candidate entity set can be received. For example, if the candidate entity set includes eight candidate entities, candidate entity information corresponding to the eight candidate entities can be presented to the user together or one by one, and a function key for implementing selection or determining one by one is set in an operation interface, to wait to receive a selection result of the user.

[0049] In a presentation process, one or more pieces of information in the

candidate entity information can be presented. For example, the candidate entity information can include name information of a candidate entity, real scene images of the candidate entity, and trademark information of the candidate entity. In the presentation process, the three pieces of information can be all displayed, or only one piece of information can be displayed, or a combination of any two pieces of information can be displayed.

[0050] Step 25: Verify the entity information based on the selection result.

[0051] Because all candidate entities are near the entity that is to be verified, the information about the entity that is to be verified can be verified based on the selection result of the user. Specifically, the present step can include the following: matching a candidate entity in the selection result with the first entity set. When a matching degree satisfies a specific condition, the verification succeeds. If the matching degree does not satisfy the specific condition, the verification fails. For example, the specific condition can be that a matching degree is greater than 50%, and the candidate entity set includes eight first entities. If the user can select five (more than five) entities from the eight first entities, the verification succeeds. If the user selects only three entities from the eight first entities, the verification fails, or human review is performed to continue verification.

[0052] According to the method provided in Implementation 2, the candidate entity set whose location relationship with the entity satisfies the proximity condition and that does not include the entity is determined based on the location information in the entity information sent by the user, and verification is performed based on the result of determining, by the user, the candidate entity information corresponding to the candidate entity set under the proximity condition. For a problem in the existing technology that verification accuracy is relatively low because authenticity of entity information is subjectively determined through human review, in the present solution, the entity is bypassed, and authenticity of the entity that is to be verified is objectively verified based on user's full knowledge of an environment around the entity by using an entity near the entity that is to be verified, thereby improving verification accuracy.

[0053] Implementation 3

[0054] As described in the background, electronic commerce, social networking, or even banking services can be implemented over the Internet. With the development of economy, especially the development of electronic commerce, a merchant can sell merchandise originally sold in a physical store (offline) by using a virtual store

registered on an Internet electronic commerce platform (platform for short) (online), to be specific, online to offline (O2O) means that an offline business opportunity is combined with the Internet, and a physical store is displayed by using a virtual store. The platform usually needs to verify the physical store to determine whether the physical store really exists. However, in the existing technology, location information and real scene images of the physical store are usually verified through human review, so that verification accuracy is relatively low and timeliness is not guaranteed. Therefore, based on the same inventive concept as Implementation 1, Implementation 3 is used as an extension of Implementation 1, An implementation of the present application provides a method for verifying a physical store, to improve accuracy of verifying a physical store. As shown in FIG. 3, the method includes the following steps:

[0055] Step 31: Determine location information in physical store information sent by a user.

[0056] To register a virtual store on the platform, the user first needs to upload the physical store information for verification. The physical store information can include location information, and can further include name information, real scene images, trademark information, etc. For example, the location information can be coordinates that include a longitude and a latitude.

[0057] Step 32: Determine, based on the location information, a first physical store set whose location relationship with the physical store satisfies a proximity condition, and a second physical store set whose location relationship with the physical store satisfies a non-proximity condition.

[0058] As shown in FIG. 4, "physical store 1" is the name information of the physical store that is sent by the user, and "physical store 2", "physical store 3", etc. are existing and real physical stores. A location of "physical store 1" in the figure is a location corresponding to the location information (the coordinates including the longitude and the latitude) in the physical store information. The proximity condition is that a physical store is within a circular range in which the location information is a center and a radius is predetermined as 200 meters. For example, as shown in FIG. 5, a dashed-line circle is a circle in which the location of "physical store 1" is a center and a radius is 200 meters. In the dashed-line circular range, there are three physical stores: "physical store 2", "physical store 3", and "physical store 4", and the three physical stores are determined as the first physical store set.

[0059] The non-proximity condition is that a physical store is outside a circular range in which the location information is a center and a radius is predetermined as 2000 meters. There are a plurality of physical stores outside the circular range, and three physical stores: "physical store n", "physical store n–1", and "physical store n–2" are selected from the plurality of physical stores and are determined as the second physical store set.

[0060] Step 33: Determine the first physical store set and the second physical store set as candidate physical store sets.

[0061] In the present step, "physical store 2", "physical store 3", "physical store 4", and "physical store n", "physical store n–1", and "physical store n–2" can be determined as candidate physical store sets.

[0062] Step 34: Send the proximity condition and candidate physical store information corresponding to the candidate physical store sets to the user.

[0063] In step 32, the proximity condition is that the physical store is within the circular range in which the location information of the physical store that is to be verified is the center and the radius is predetermined as 200 meters. The present step can be shown in FIG. 6, the proximity condition is sent to the user as a verification condition, and it can be set that only three physical stores can be selected. For example, "select three nearby stores" can be sent to the user.

[0064] In addition, the candidate physical store information corresponding to the candidate physical store sets such as name information and real scene images of a candidate physical store is sent to the user.

[0065] Step 35: Receive a result of selection performed by the user in the candidate physical store sets.

[0066] As shown in FIG. 6, a selection interface is provided for the user, so that the user can perform selection and return a selection result. In the previous step, it can be set that only three physical stores can be selected. Therefore, in the present step, three physical stores selected by the user from the candidate physical store sets can be received.

[0067] Step 36: Match a candidate physical store in the selection result with the first physical store set, and when a matching degree satisfies a specific condition, the verification succeeds.

[0068] The specific condition is that the matching degree is not less than 50%. Therefore, only when the three physical stores selected by the user are two or three of

"physical store 2", "physical store 3", and "physical store 4", verification can succeed.

[0069] According to the method provided in Implementation 3, based on the location information in the physical store information that is sent by the user, the first physical store set whose location relationship with the physical store satisfies the proximity condition and that does not include the physical store, and the second physical store set whose location relationship with the physical store satisfies the non-proximity condition are determined, and the two physical store sets are determined as the candidate physical store sets. The physical store is verified based on a result of determining, by the user, the candidate physical store information corresponding to the candidate physical store sets under the proximity condition. For a problem in the existing technology that verification accuracy is relatively low because authenticity of physical store information is subjectively determined through human review, in the present solution, the physical store is bypassed, and authenticity of the physical store is objectively verified based on user's knowledge of an environment around the physical store, thereby improving verification accuracy. In addition, by using the present solution, human review interventions can be reduced or even avoided, thereby improving timeliness of a verification process.

[0070] Implementation 4

[0071] Based on the same inventive concept, Implementation 4 provides an apparatus for verifying entity information, to improve accuracy of verifying entity information. As shown in FIG. 7, the apparatus includes a first determining unit 41, a second determining unit 42, and a verification unit 43.

[0072] The first determining unit 41 can be configured to determine location information in entity information sent by a user.

[0073] The second determining unit 42 can be configured to determine, based on the location information, a candidate entity set whose location relationship with the entity satisfies a predetermined condition. The candidate entity set does not include the entity.

[0074] The verification unit 43 can be configured to verify the entity information based on a result of determining, by the user, candidate entity information corresponding to the candidate entity set under a predetermined verification condition.

[0075] In an implementation, the second determining unit 42 can be configured to determine, based on the location information, a first entity set whose location relationship with the entity satisfies a proximity condition, and/or determine, based on

the location information, a second entity set whose location relationship with the entity satisfies a non-proximity condition; and determine the first entity set and/or the second entity set as the candidate entity set.

[0076] In an implementation, the candidate entity set includes at least the first entity set, and the predetermined verification condition is the proximity condition, and the verification unit 43 can be configured to send the proximity condition to the user, receive a result of selection performed by the user in the candidate entity set, and verify the entity information based on the selection result.

[0077] In an implementation, the verification unit 43 can be configured to match a candidate entity in the selection result with the first entity set, where when a matching degree satisfies a specific condition, the verification succeeds.

[0078] In an implementation, the proximity condition includes that an entity is within a circular range in which the location information is a center and a radius is a predetermined first threshold.

[0079] In an implementation, the candidate entity information can include at least one of the following: name information of a candidate entity, real scene images of the candidate entity, and trademark information of the candidate entity.

[0080] According to the apparatus provided in Implementation 4, the candidate entity set whose location relationship with the entity satisfies the predetermined condition and that does not include the entity is determined based on the location information in the entity information sent by the user, and verification is performed based on the result of determining, by the user, the candidate entity information corresponding to the candidate entity set under the predetermined verification condition. For a problem in the existing technology that verification accuracy is relatively low because authenticity of entity information is subjectively determined through human review, in the present solution, the entity is bypassed, and authenticity of the entity is objectively verified based on user's knowledge of an environment around the entity, thereby improving verification accuracy. In addition, by using the present solution, human review interventions can be reduced or even avoided, thereby improving timeliness of a verification process.

[0081] A person skilled in the art should understand that the implementations of the present application can be provided as a method, a system, or a computer program product. Therefore, the present application can use a form of hardware only implementations, software only implementations, or implementations with a

combination of software and hardware. In addition, the present application can use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a magnetic disk storage, a CD-ROM, an optical memory, etc.) that include computer-usable program code.

[0082] The present application is described with reference to the flowcharts and/or block diagrams of the method, the device (system), and the computer program product according to the implementations of the present application. It is worthwhile to note that computer program instructions can be used to implement each process and/or each block in the flowcharts and/or the block diagrams and a combination of a process and/or a block in the flowcharts and/or the block diagrams. These computer program instructions can be provided for a general-purpose computer, a dedicated computer, an embedded processor, or a processor of another programmable data processing device to generate a machine, so that the instructions executed by the computer or the processor of the another programmable data processing device generate an apparatus for implementing a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

[0083] These computer program instructions can be stored in a computer readable memory that can instruct the computer or the another programmable data processing device to work in a specific way, so that the instructions stored in the computer readable memory generate an artifact that includes an instruction apparatus. The instruction apparatus implements a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

[0084] These computer program instructions can be loaded onto the computer or another programmable data processing device, so that a series of operations and steps are performed on the computer or the another programmable device, thereby generating computer-implemented processing. Therefore, the instructions executed on the computer or the another programmable device provide steps for implementing a specific function in one or more processes in the flowcharts and/or in one or more blocks in the block diagrams.

[0085] In a typical configuration, a computing device includes one or more processors (CPU), one or more input/output interfaces, one or more network interfaces, and one or more memories.

[0086] The memory may include a non-persistent memory, a random access memory (RAM), and/or a non-volatile memory in a computer readable medium, for

example, a read-only memory (ROM) or a flash memory (flash RAM). The memory is an example of the computer readable medium.

[0087] The computer readable medium includes persistent, non-persistent, movable, and unmovable media that can store information by using any method or technology. The information can be a computer readable instruction, a data structure, a program module, or other data. Examples of a computer storage medium include but are not limited to a phase-change random access memory (PRAM), a static random access memory (SRAM), a dynamic random access memory (DRAM), another type of random access memory (RAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a flash memory or another memory technology, a compact disc read-only memory (CD-ROM), a digital versatile disc (DVD) or another optical storage, a cassette, a cassette magnetic disk storage or another magnetic storage device or any other non-transmission medium. The computer storage medium can be used to store information that can be accessed by a computing device. As described in the present specification, the computer readable medium does not include computer readable transitory media (transitory media) such as a modulated data signal and a carrier.

[0088] It is worthwhile to further note that, the terms "include", "comprise", or their any other variants are intended to cover a non-exclusive inclusion, so that a process, a method, a product or a device that includes a list of elements not only includes those elements but also includes other elements which are not expressly listed, or further includes elements inherent to such process, method, product, or device. An element preceded by "includes a..." does not, without more constraints, preclude the existence of additional identical elements in the process, method, article, or device that includes the element.

[0089] A person skilled in the art should understand that the implementations of the present application can be provided as a method, a system, or a computer program product. Therefore, the present application can use a form of hardware only implementations, software only implementations, or implementations with a combination of software and hardware. In addition, the present application can use a form of a computer program product that is implemented on one or more computer-usable storage media (including but not limited to a magnetic disk storage, a CD-ROM, an optical memory, etc.) that include computer-usable program code.

[0090] The previous descriptions are merely implementations of the present

application, and are not intended to limit the present application. A person skilled in the art can make various modifications and changes to the present application. Any modification, equivalent replacement, or improvement made without departing from the spirit and principle of the present application shall fall within the scope of the claims in the present application.

CLAIMS

What is claimed is:

1. A computer-implemented method for verifying entity location information, comprising:

identifying location information associated with a particular entity;

determining, based on the location information, a candidate entity set including a plurality of candidate entities, wherein each candidate entity is different than the particular entity, and wherein the candidate entity set includes a correct set including candidate entities that satisfy a predetermined location condition;

sending the candidate entity set and the predetermined location condition to the particular entity;

receiving a selected entity set including one or more of the candidate entities;

determining that the selected entity set includes a number of candidate entities from the correct set that satisfies a location verification threshold; and

in response to determining that the selected entity set includes the number of candidate entities from the correct set that exceeds the location verification threshold, determining that the location information of the particular entity is verified.

2. The method according to claim 1, wherein the particular entity is a first entity, the candidate entity set is a first candidate entity set, the correct set is a first correct set, the selected entity set is a first selected entity set, and the method further comprising:

identifying location information associated with a second entity;

determining, based on the location information, a second candidate entity set including a second correct set including candidate entities that satisfy the predetermined location condition;

sending the second candidate entity set and the predetermined location condition to the second entity;

receiving a second selected entity set including one or more of the candidate entities;

determining that the second selected entity set includes a number of candidate entities from the second correct set that does not satisfy the location verification threshold; and

in response to determining that the second selected entity set includes the number of

candidate entities from the second correct set that does not satisfy the location verification threshold, determining that the location information of the particular entity is not verified.

3. The method according to claim 1, wherein the predetermined location condition includes a proximity condition.

4. The method according to claim 3, wherein the proximity condition specifies an area surrounding a location specified by the location information, and a candidate entity satisfies the proximity condition if its location is within the area.

5. The method according to claim 1, wherein the predetermined location condition includes a non-proximity condition.

6. The method according to claim 5, wherein the non-proximity condition specifies an area surrounding a location specified by the location information, and a candidate entity satisfies the non-proximity condition if its location is outside the area.

7. The method according to claim 1, wherein the candidate entity set comprises, for each candidate entity, at least one of the following:

name information of the candidate entity, real scene images of the candidate entity, and trademark information of the candidate entity.

8. The method according to claim 1, wherein the location verification threshold includes a percentage of the correct set.

9. The method according to claim 1, wherein determining that the location information of the particular entity is verified comprises determining that the particular entity is associated with a physical location matching the location information.

10. A non-transitory, computer-readable medium storing one or more instructions executable by a computer system to perform operations comprising:

identifying location information associated with a particular entity;

determining, based on the location information, a candidate entity set including a plurality of candidate entities, wherein each candidate entity is different than the particular entity, and wherein the candidate entity set includes a correct set including candidate entities that satisfy a predetermined location condition;

sending the candidate entity set and the predetermined location condition to the particular entity;

receiving a selected entity set including one or more of the candidate entities;

determining that the selected entity set includes a number of candidate entities from the correct set that satisfies a location verification threshold; and

in response to determining that the selected entity set includes the number of candidate entities from the correct set that exceeds the location verification threshold, determining that the location information of the particular entity is verified.

11. The non-transitory, computer-readable medium of claim 10, wherein the particular entity is a first entity, the candidate entity set is a first candidate entity set, the correct set is a first correct set, the selected entity set is a first selected entity set, and the operations further comprising:

identifying location information associated with a second entity;

determining, based on the location information, a second candidate entity set including a second correct set including candidate entities that satisfy the predetermined location condition;

sending the second candidate entity set and the predetermined location condition to the second entity;

receiving a second selected entity set including one or more of the candidate entities;

determining that the second selected entity set includes a number of candidate entities from the second correct set that does not satisfy the location verification threshold; and

in response to determining that the second selected entity set includes the number of candidate entities from the second correct set that does not satisfy the location verification threshold, determining that the location information of the particular entity is not verified.

12. The non-transitory, computer-readable medium of claim 10, wherein the

predetermined location condition includes a proximity condition.

13. The non-transitory, computer-readable medium of claim 12, wherein the proximity condition specifies an area surrounding a location specified by the location information, and a candidate entity satisfies the proximity condition if its location is within the area.

14. The non-transitory, computer-readable medium of claim 10, wherein the predetermined location condition includes a non-proximity condition.

15. The non-transitory, computer-readable medium of claim 14, wherein the non-proximity condition specifies an area surrounding a location specified by the location information, and a candidate entity satisfies the non-proximity condition if its location is outside the area.

16. The non-transitory, computer-readable medium of claim 10, wherein the candidate entity set comprises, for each candidate entity, at least one of name information of the candidate entity, real scene images of the candidate entity, or trademark information of the candidate entity.

17. The non-transitory, computer-readable medium of claim 10, wherein the location verification threshold includes a percentage of the correct set.

18. The non-transitory, computer-readable medium of claim 10, wherein determining that the location information of the particular entity is verified comprises determining that the particular entity is associated with a physical location matching the location information.

19. A computer-implemented system, comprising:

one or more computers; and

one or more computer memory devices interoperably coupled with the one or more computers and having tangible, non-transitory, machine-readable media storing one or more instructions that, when executed by the one or more computers, perform one or more operations comprising:

identifying location information associated with a particular entity;

determining, based on the location information, a candidate entity set including a plurality of candidate entities, wherein each candidate entity is different than the particular entity, and wherein the candidate entity set includes a correct set including candidate entities that satisfy a predetermined location condition;

sending the candidate entity set and the predetermined location condition to the particular entity;

receiving a selected entity set including one or more of the candidate entities;

determining that the selected entity set includes a number of candidate entities from the correct set that satisfies a location verification threshold; and

in response to determining that the selected entity set includes the number of candidate entities from the correct set that exceeds the location verification threshold, determining that the location information of the particular entity is verified.

20. The computer-implemented system of claim 19, wherein the particular entity is a first entity, the candidate entity set is a first candidate entity set, the correct set is a first correct set, the selected entity set is a first selected entity set, and the operations further comprising:

identifying location information associated with a second entity;

determining, based on the location information, a second candidate entity set including a second correct set including candidate entities that satisfy the predetermined location condition;

sending the second candidate entity set and the predetermined location condition to the second entity;

receiving a second selected entity set including one or more of the candidate entities;

determining that the second selected entity set includes a number of candidate entities from the second correct set that does not satisfy the location verification threshold; and

in response to determining that the second selected entity set includes the number of candidate entities from the second correct set that does not satisfy the location verification threshold, determining that the location information of the particular entity is not verified.