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(54) **Title:** METHOD AND APPARATUS FOR RECOMMENDING DATA

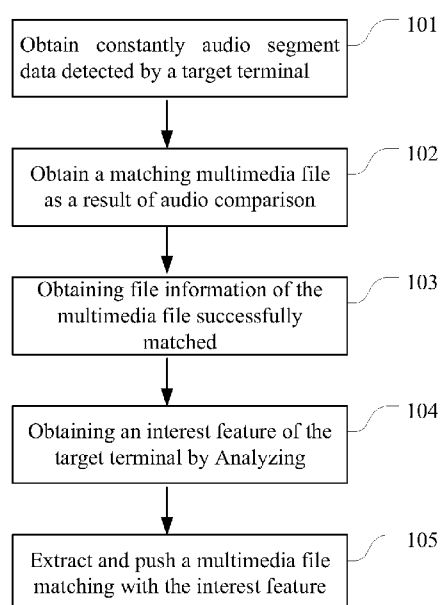


Fig. 1

(57) **Abstract:** The disclosure discloses a method and apparatus for recommending data, the method includes: obtaining constantly audio segment data detected by a target terminal; comparing each piece of the audio segment data with audios in pre-stored multimedia files, and obtaining a multimedia file matching with each piece of the audio segment data; obtaining file information of the multimedia file successfully matched in a preset period of time; obtaining an interest feature of the target terminal by analyzing the file information obtained in the preset period of time; and extracting and pushing to the target terminal a multimedia file matching with the interest feature of the target terminal.



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METHOD AND APPARATUS FOR RECOMMENDING DATA

CROSS REFERENCE

[0001] This application claims priority to Chinese Patent Application No. 2016101689294, filed on March 23, 2016, entitled "METHOD AND APPARATUS FOR RECOMMENDING DATA", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of data processing, and particularly to a method and apparatus for recommending data.

BACKGROUND

[0003] A broadband access to the Internet has become increasingly widespread at home along with the rapid development of network technologies so that it has become common to watch TV programs, movies, and other multimedia programs over the Internet as our entertainment at home.

[0004] The multimedia programs are watched on smart devices, e.g., smart TV sets, smart mobile phones, tablet computers, PCs, etc., over the Internet typically using their corresponding applications. The providers of the smart devices may monitor when and which applications are run on the smart devices, but the providers cannot be provided with program watching records and other data of users, so that the providers cannot obtain a statistic of the program watching records and other data of the users, and consequently cannot recommend contents that are consistent with interests and hobbies of the users to the corresponding smart devices according to the records of the multimedia programs watched by the users on the smart devices.

SUMMARY

[0005] The present disclosure is to provide a method, apparatus and non-transitory computer readable medium for recommending data.

[0006] The present disclosure provides a method for recommending data. The method is applicable to the network server side and may include: obtaining constantly audio segment data detected by a target terminal; comparing each piece of the audio segment data with audios in pre-stored multimedia files, and obtaining a multimedia file matching with each piece of the audio segment data; obtaining file information of the multimedia file successfully matched in a preset period of time; obtaining an interest feature of the target terminal by analyzing the file

information obtained in the preset period of time; and extracting and pushing to the target terminal a multimedia file matching with the interest feature of the target terminal.

[0007] In some embodiments, the step of comparing each piece of the audio segment data with the audios in the pre-stored multimedia files, and obtaining the multimedia file matching with each piece of the audio segment data may include: separating multimedia audio data from the pre-stored multimedia files; comparing the audio segment data with audios in the multimedia audio data, and obtaining multimedia audio data matching with the audio segment data; and obtaining a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

[0008] In some embodiments, the multimedia files may include movies, music, and/or teleplays; and after the step of comparing each piece of the audio segment data with audios in pre-stored multimedia files, and obtaining a multimedia file matching with each piece of the audio segment data, the method may further include: determining whether the number of the multimedia files matching with the audio segment data is more than or equal to 2; if the number of the multimedia files matching with the audio segment data is more than or equal to 2, then obtaining new audio segment data detected by the target terminal; matching the new audio segment data together with the audio segment data with the pre-stored multimedia files, and obtaining a new multimedia file matching with both the new audio segment data and the audio segment data; determining whether the number of the new multimedia files is more than or equal to 2; and if the number of the new multimedia files is 1, then replacing the new multimedia file with the multimedia file matching with the audio segment data.

In some embodiments, the step of obtaining the interest feature of the target terminal by analyzing the file information obtained in the preset period of time includes: obtaining corresponding category information and tag information by analyzing the file information obtained in each of the preset period of time; assigning the corresponding category information and tag information with weights varying with time when the file information is obtained; and obtaining the interest feature of the target terminal by calculating with reference to the category information and the tag information in the file information obtained in the preset period of time and the corresponding weights.

[0009] In some embodiments, before the step of obtaining constantly the audio segment data detected by the target terminal, the method further includes: obtaining key audio segment data by parsing the pre-stored multimedia files; and associating the key audio segment data with key picture and text information; and after the step of obtaining constantly audio segment data detected by a target terminal, the method may further include: determining whether the audio

segment data match with the key audio segment data; and if the audio segment data match with the key audio segment data, then pushing the key picture and text information associated with the key audio segment data to the target terminal.

[0010] Another aspect of the disclosure further provides an apparatus for recommending data.

5 The apparatus may include: an audio segment data obtaining module configured to obtain constantly audio segment data detected by a target terminal; a multimedia file matching module configured to compare each piece of the audio segment data with audios in pre-stored multimedia files, and to obtain a multimedia file matching with each piece of the audio segment data; a file information obtaining module configured to obtain file information of the
10 multimedia file successfully matched in a preset period of time; an interest feature analyzing module configured to obtain an interest feature of the target terminal by analyzing the file information obtained in the preset period of time; and a multimedia file pushing module configured to extract and push to the target terminal a multimedia file matching with the interest feature of the target terminal.

15 **[0011]** In some embodiments, the multimedia file matching module is configured to: separate multimedia audio data from the pre-stored multimedia files; compare the audio segment data with audios in the multimedia audio data, and to obtain multimedia audio data matching with the audio segment data; and obtain a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

20 **[0012]** In some embodiments, the multimedia files may include movies, music, and/or teleplays; and the multimedia file matching module is further configured to: determine whether the number of the multimedia files matching with the audio segment data is more than or equal to 2; if the number of the multimedia files matching with the audio segment data is more than or equal to 2, obtain new audio segment data detected by the target terminal; match the new audio
25 segment data together with the audio segment data with the pre-stored multimedia files, and obtain a new multimedia file matching with both the new audio segment data and the audio segment data; determine whether the number of the new multimedia files is more than or equal to 2; and if the number of the new multimedia files is 1, replace the new multimedia file with the multimedia file matching with the audio segment data.

30 In some embodiments, the interest feature analyzing module is configured to: obtain corresponding category information and tag information by analyzing the file information obtained in each of the preset period of time; assign the corresponding category information and tag information with weights varying with time when the file information is obtained; and obtain the interest feature of the target terminal by calculating with reference to the category

information and the tag information in the file information obtained in the preset period of time and the corresponding weights.

[0013] In some embodiments, the apparatus may further include: a key audio segment parsing module configured to obtain key audio segment data by parsing the pre-stored multimedia files; a picture and text information associating module configured to associate the key audio segment data with key picture and text information; a key audio segment matching module configured to determine whether the audio segment data match with the key audio segment data; and a picture and text information pushing module configured, if the audio segment data match with the key audio segment data, to push the key picture and text information associated with the key audio segment data to the target terminal.

[0014] The present disclosure provides an electronic device for recommending data. The electronic device may include: at least one processor; and a memory communicably connected with the at least one processor for storing instructions executable by the at least one processor, wherein execution of the instructions by the at least one processor causes the at least one processor to perform a method according to any methods disclosed herein.

[0015] The present disclosure provides a non-transitory computer-readable storage medium storing executable instructions for recommending data. The instructions, when executed by an electronic device, may cause the electronic device to perform a method according to any methods disclosed herein.

[0016] The present disclosure provides a computer program product for recommending data. The computer program product may include a computer program stored on a non-transitory computer-readable storage medium. The computer program may include program code which, when executed on a computer, may cause the computer to perform a method according to any methods disclosed herein.

[0017] It should be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] One or more embodiments are illustrated by way of example, and not by limitation, in the figures of the accompanying drawings, wherein elements having the same reference numeral designations represent like elements throughout. The drawings are not to scale, unless otherwise disclosed.

[0019] Fig. 1 is a schematic flow chart of a method for recommending data according to an embodiment of the present disclosure;

[0020] Fig. 2 is a schematic flow chart of a method for recommending data according to another embodiment of the disclosure;

[0021] Fig. 3 is a schematic structural diagram of modules in an apparatus for recommending data according to an embodiment of the disclosure; and

5 **[0022]** Fig. 4 illustrates a storage medium processing apparatus.

[0023] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions and/or relative positioning of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of various examples of the present application.

10 Also, common but well-understood elements that are useful or necessary in a commercially feasible example are often not depicted in order to facilitate a less obstructed view of these various examples. It will further be appreciated that certain actions and/or steps may be described or depicted in a particular order of occurrence while those skilled in the art will understand that such specificity with respect to sequence is not actually required. It will also
15 be understood that the terms and expressions used herein have the ordinary technical meaning as is accorded to such terms and expressions by persons skilled in the technical field as set forth above, except where different specific meanings have otherwise been set forth herein.

DETAILED DESCRIPTION

20 **[0024]** The present disclosure will be described in more detail in conjunction with specific embodiments and with reference to figures to make the objects, technical solutions and advantages of the present disclosure more clear and more apparent.

[0025] It is appreciated that the expressions “first” and “second” used in the embodiment of the present disclosure are only intended to distinguish two different entities or different
25 parameters which have the same terminology. It can be seen that “first” and “second” are presented only for purpose of easy illustration and should not be understood as limiting the embodiments of the present disclosure. This will not be explained in the subsequent embodiments.

[0026] The terminology used in the present disclosure is for the purpose of describing
30 exemplary embodiments only and is not intended to limit the present disclosure. As used in the present disclosure and the appended claims, the singular forms “a,” “an” and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It shall also be understood that the terms “or” and “and/or” used herein are intended to signify and include any or all possible combinations of one or more of the associated listed items, unless the

context clearly indicates otherwise.

[0027] Reference throughout this specification to "one embodiment," "an embodiment," "exemplary embodiment," or the like in the singular or plural means that one or more particular features, structures, or characteristics described in connection with an embodiment is included in at least one embodiment of the present disclosure. Thus, the appearances of the phrases "in one embodiment" or "in an embodiment," "in an exemplary embodiment," or the like in the singular or plural in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics in one or more embodiments may include combined in any suitable manner

[0028] The present disclosure is to provide a method and apparatus for recommending data so as to recommend data that meet the interest feature of the target terminal to the target terminal, and the recommended data are more satisfactory.

[0029] The method and apparatus for recommending data according to the embodiment of the disclosure obtain constantly the audio segment data detected by the target terminal, obtain the multimedia file corresponding to the audio segment data as a result of audio comparison, obtain the corresponding file information, analyze the file information in the preset period of time for the interest feature of the target terminal, and recommend the multimedia file to the target terminal according to the interest feature, so that pertinent multimedia file can be recommended to the target terminal instead of some of the latest and the most popular interest features generally recommended, to thereby improve the favor of the user, and optimize the experience of the user.

[0030] In a technical solution according to an embodiment of the disclosure, there is provided a method for recommending data, wherein the method can recommend data that meet the interest feature of the target terminal to the target terminal and the recommended data are more satisfactory. Fig. 1 illustrates a schematic flow chart of a method for recommending data according to an embodiment of the disclosure.

[0031] The method for recommending data is applicable to the network server side and includes:

[0032] The step 101 is to obtain constantly audio segment data detected by a target terminal;

[0033] The audio segment data detected by a target terminal refer to audio segment data detected and uploaded in real time by the target terminal to the network server side, and at this time, the target terminal needs to be provided therein accordingly with an audio acquiring module configured to detect the audio generated in the target terminal, where the audio generated in the target terminal refers to an audio carried in a multimedia program being played

by the target terminal, that is, the audio of the current multimedia program can be acquired in real time even if the audio is mute; and the audio segment data here can be audio segment data detected at a preset acquisition interval of time and frequency; for example, the length of time of the audio segment data ranges from 15 to 30 seconds, the acquisition interval of time of each
5 piece of audio segment data ranges from 0 to 30 seconds, etc.;

[0034] The step 102 is to compare each piece of the audio segment data with audios in pre-stored multimedia files, and to obtain a multimedia file matching with each piece of the audio segment data, where the pre-stored multimedia files can be all the multimedia files pre-stored in a database at the network server side, or can be pre-filtered multimedia files for
10 audio comparison stored in a folder in the database;

[0035] Audio comparison here can be the comparison of the audio segment data with the audio carried in the multimedia files, i.e., direct comparison of the audio segment data with the audio carried in the multimedia files without any conversion of the audio segment data into data in another format, e.g., a text;

[0036] The step 103 is to obtain file information of the multimedia file successfully matched in a preset period of time, wherein the preset period of time is a preset interval of time for extracting the file information, e.g., the last half of a month, the last month, the last quarter, etc., where the operation of the step 103 can be triggered by restarting the disabled target terminal, and at this time, the target terminal sends a recommended content obtainment instruction to the
15 network server side so that the network server side obtains file information of the multimedia file successfully matched in the preset period of time in order to recommend contents to the target terminal;

[0037] The file information of the multimedia file can include but will not be limited to the filename, creation time, showing time, length of time, level-1 category information, level-2
20 category information, a tag preset by the operator, a tag preset by a user, etc;

[0038] The step 104 is to obtain an interest feature of the target terminal by analyzing the file information obtained in the preset period of time, where the file information in the preset period of time is obtained so that a historical record of watching on the target terminal in the preset period of time is obtained, and the file information can be analyzed accordingly for the interest
25 feature representing a habit of watching on the target terminal in the preset period of time; and

[0039] The step 105 is to extract and push to the target terminal a multimedia file matching with the interest feature of the target terminal from the pre-stored multimedia files, where the pushed multimedia file can include watching paths and preview pictures of pushed multimedia data so that the preview pictures are presented on a screen of the target terminal, and if a
30

corresponding preview picture is clicked on, then corresponding data will be retrieved and watched over a watching path associated with the preview picture.

[0040] As can be apparent from the embodiment above, the method for recommending data according to the embodiment of the disclosure obtains constantly the audio segment data detected by the target terminal, obtains the multimedia file corresponding to the audio segment data as a result of audio comparison, obtains the corresponding file information, analyzes the file information in the preset period of time for the interest feature of the target terminal, and recommends the multimedia file to the target terminal according to the interest feature, so that pertinent multimedia file can be recommended to the target terminal instead of some of the latest and the most popular interest features generally recommended, to thereby improve the favor of the user, and optimize the experience of the user.

[0041] Furthermore in some alternative embodiments, the step 102 of comparing each piece of the audio segment data with the audios in the pre-stored multimedia files, and obtaining the multimedia file matching with each piece of the audio segment data further includes the following steps:

[0042] separating multimedia audio data from the pre-stored multimedia files, where the multimedia audio data are the audio components in the multimedia files, and the multimedia audio data can be obtained from the multimedia files by separating the audio from the multimedia file, although a detailed description thereof will be omitted here;

[0043] comparing the audio segment data with the audios in the multimedia audio data, and obtaining multimedia audio data matching with the audio segment data; and

[0044] obtaining a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

[0045] The audio segment data can be matched as a result of direct audio comparison without being converted into other data to thereby dispense with the steps of data conversion, and achieve higher accuracy.

[0046] Preferably in some alternative embodiments, the multimedia files include movies, music, and/or teleplays, and even advertisements.

[0047] Since music episodes may appear in movies, advertisements, and teleplays, if the audio segment data are exactly a segment of some music, and the segment of the music also appears in a movie, a teleplay, or an advertisement, then there will be more than one matching results.

[0048] Thus after the step 102 of comparing each piece of the audio segment data with the audios in the pre-stored multimedia files, and obtaining the multimedia file matching with each

piece of the audio segment data, the method further includes the followings steps:

[0049] determining whether the number of the multimedia files matching with the audio segment data is more than or equal to 2;

5 **[0050]** if the number of the multimedia files matching with the audio segment data is more than or equal to 2, then obtaining new audio segment data detected by the target terminal, where the new audio segment data can be the next piece of audio segment data immediately succeeding to the audio segment data; and of course, the new audio segment data can alternatively be a still next audio segment data succeeding to the audio segment data, etc., as long as a matching result can be obtained;

10 **[0051]** matching the new audio segment data together with the audio segment data with the pre-stored multimedia files, and obtaining a new multimedia file matching with both the new audio segment data and the audio segment data;

[0052] determining whether the number of the new multimedia files is more than or equal to 2; and

15 **[0053]** if the number of the new multimedia files is 1, then replacing the new multimedia file with the multimedia file matching with the audio segment data.

[0054] If the number of the new multimedia files is more than or equal to 2, then the steps above will be repeated until only one matching multimedia file is determined.

20 **[0055]** With the embodiment above, if there is more than one matching multimedia file, then only one matching multimedia file will be determined to thereby improve the accuracy in the subsequent steps of analyzing the multimedia file for the interest feature.

[0056] Optionally in some embodiments, the step 104 of obtaining an interest feature of the target terminal by analyzing the file information obtained in the preset period of time further includes the following steps:

25 **[0057]** obtaining corresponding category information and tag information by analyzing the respective file information obtained in each of the preset period of time, where the category information can include but will not be limited to level-1 category information and level-2 category information of the multimedia file, and the tag information can include but will not be limited to a tag preset by the operator of the multimedia file, a tag preset for the multimedia file
30 by a user, etc.;

[0058] assigning the corresponding category information and tag information with weights varying with time when the file information is obtained, that is, there are a lower weight for the temporally older file information, and a higher weight for the temporally newer file information; and

[0059] obtaining the interest feature of the target terminal by calculating with reference to the category information and the tag information in the file information obtained in the preset period of time and the corresponding weights, where the interest feature can be a function of the category information and the tag information which is respective parameters with a feature vector of their weights so that data can be subsequently recommended based upon the interest feature by matching directly the feature vector with the feature vectors of the multimedia files to thereby obtain the matching multimedia file.

[0060] Preferably in some alternative embodiments, before the step 101 of obtaining constantly audio segment data detected by a target terminal, the method further includes the following steps:

[0061] obtaining key audio segment data by parsing the pre-stored multimedia files; and

[0062] associating the key audio segment data with key picture and text information; and

[0063] after the step of obtaining constantly audio segment data detected by a target terminal, the method further includes the following steps:

[0064] determining whether the audio segment data match with the key audio segment data; and

[0065] if the audio segment data match with the key audio segment data, then pushing the key picture and text information associated with the key audio segment data to the target terminal;

[0066] where the key audio segment data refer to audio segment data, appearing at one or more positions in the multimedia file, which can be associated with the key picture and text information, and if the multimedia file is played to the position of the key audio segment data, then the audio segment data acquired at this time will exactly match with the key audio segment data so that the network server side is triggered to push the key picture and text information associated with the key audio segment data to the target terminal; and the key picture and text information can be a segment of video, a segment of music, a segment of animation, a segment of advertisement, etc.

[0067] The key audio segment data and the associated key picture and text information are set so that if the audio segment data matching with the key audio segment data appear in the multimedia file being watched on the target terminal, then some key picture and text information which may be interesting to the user or can improve the favor of the user can be pushed to the user, so that the watching user will not feel dull and tired, and can be provided with additional information.

[0068] Another embodiment of the disclosure further provides a method for recommending data. Fig. 2 illustrates a schematic flow chart of a method for recommending data according to

another embodiment of the disclosure.

[0069] The method for recommending data, applicable to the network server side, includes:

[0070] The step 201 is to obtaining key audio segment data by parsing pre-stored multimedia files;

5 **[0071]** The step 202 is to associate the key audio segment data with key picture and text information;

[0072] The step 203 is to obtain constantly audio segment data detected by a target terminal;

[0073] The step 204 is to determine whether the audio segment data match with the key audio segment data;

10 **[0074]** The step 205 is, if the audio segment data match with the key audio segment data, to push the key picture and text information associated with the key audio segment data to the target terminal;

[0075] The step 206 is to compare each piece of the audio segment data with audios in the pre-stored multimedia files, and to obtain a multimedia file matching with each piece of the
15 audio segment data;

[0076] The step 207 is to determine whether the number of the multimedia files matching with the audio segment data is more than or equal to 2;

[0077] The step 208 is, if the number of the multimedia files matching with the audio segment data is more than or equal to 2, to obtain new audio segment data detected by the target
20 terminal;

[0078] The step 209 is to match the new audio segment data together with the audio segment data with the pre-stored multimedia files, and to obtain a new multimedia file matching with both the new audio segment data and the audio segment data;

[0079] The step 210 is to determine whether the number of the new multimedia files is more
25 than or equal to 2;

[0080] The step 211 is, if the number of the new multimedia files is 1, to replace the new multimedia file with the multimedia file matching with the audio segment data;

[0081] The step 212 is, if the number of the new multimedia files is more than or equal to 2, to return to the step 208;

30 **[0082]** The step 213 is to obtain file information of the multimedia file successfully matched in a preset period of time;

[0083] The step 214 is to obtain an interest feature of the target terminal by analyzing the file information obtained in the preset period of time; and

[0084] The step 215 is to extract and push to the target terminal a multimedia file matching

with the interest feature of the target terminal from the pre-stored multimedia files.

[0085] As can be apparent from the embodiment above, the method for recommending data according to the embodiment of the disclosure obtains constantly the audio segment data detected by the target terminal, obtains the multimedia file corresponding to the audio segment data as a result of audio comparison, obtains the corresponding file information, analyzes the file information in the preset period of time for the interest feature of the target terminal, and recommends the multimedia file to the target terminal according to the interest feature, so that pertinent multimedia file can be recommended to the target terminal instead of some of the latest and the most popular interest features generally recommended, to thereby improve the favor of the user, and optimize the experience of the user.

[0086] In another technical solution according to an embodiment of the disclosure, there is provided an apparatus for recommending data, wherein the apparatus can recommend data that meet the interest feature of the target terminal to the target terminal and the recommended data are more satisfactory. Fig. 3 illustrates a schematic structural diagram of modules in an apparatus for recommending data according to an embodiment of the disclosure.

[0087] The apparatus for recommending data includes:

[0088] an audio segment data obtaining module 301 configured to obtain constantly audio segment data detected by a target terminal;

[0089] the audio segment data detected by a target terminal refer to audio segment data detected and uploaded in real time by the target terminal to the network server side, and at this time, the target terminal needs to be provided therein accordingly with an audio acquiring module configured to detect the audio generated in the target terminal, where the audio generated in the target terminal refers to an audio carried in a multimedia program being played by the target terminal, that is, the audio of the current multimedia program can be acquired in real time even if the audio is mute; and the audio segment data here can be audio segment data detected at a preset acquisition interval of time and frequency; for example, the length of time of the audio segment data ranges from 15 to 30 seconds, the acquisition interval of time of each piece of audio segment data ranges from 0 to 30 seconds, etc.;

[0090] a multimedia file matching module 302 configured to compare each piece of the audio segment data with audios in pre-stored multimedia files, and to obtain a multimedia file matching with each piece of the audio segment data, where the pre-stored multimedia files can be all the multimedia files pre-stored in a database at the network server side, or can be pre-filtered multimedia files for audio comparison stored in a folder in the database;

[0091] audio comparison here can be the comparison of the audio segment data with the audio

carried in the multimedia files, i.e., direct comparison of the audio segment data with the audio carried in the multimedia files without any conversion of the audio segment data into data in another format, e.g., a text;

[0092] a file information obtaining module 303 configured to obtain file information of the multimedia file successfully matched in a preset period of time, wherein the preset period of time is a preset interval of time for extracting the file information, e.g., the last half of a month, the last month, the last quarter, etc., where file information obtaining module 303 can be triggered by restarting the disabled target terminal, and at this time, the target terminal sends a recommended content obtainment instruction to the network server side so that the network server side obtains file information of the multimedia file successfully matched in the preset period of time in order to recommend contents to the target terminal;

[0093] the file information of the multimedia file can include but will not be limited to the filename, creation time, showing time, length of time, level-1 category information, level-2 category information, a tag preset by the operator, a tag preset by a user, etc;

[0094] an interest feature analyzing module 304 configured to obtain an interest feature of the target terminal by analyzing the file information obtained in the preset period of time, where the file information in the preset period of time is obtained so that a historical record of watching on the target terminal in the preset period of time is obtained, and the file information can be analyzed accordingly for the interest feature representing a habit of watching on the target terminal in the preset period of time; and

[0095] a multimedia file pushing module 305 configured to extract and push to the target terminal a multimedia file matching with the interest feature of the target terminal, where the pushed multimedia file can include watching paths and preview pictures of pushed multimedia data so that the preview pictures are presented on a screen of the target terminal, and if a corresponding preview picture is clicked on, then corresponding data will be retrieved and watched over a watching path associated with the preview picture.

[0096] As can be apparent from the embodiment above, the apparatus for recommending data according to the embodiment of the disclosure obtains constantly the audio segment data detected by the target terminal, obtains the multimedia file corresponding to the audio segment data as a result of audio comparison, obtains the corresponding file information, analyzes the file information in the preset period of time for the interest feature of the target terminal, and recommends the multimedia file to the target terminal according to the interest feature, so that pertinent multimedia file can be recommended to the target terminal instead of some of the latest and the most popular interest features generally recommended, to thereby improve the

favor of the user, and optimize the experience of the user.

[0097] Furthermore in some alternative embodiments, the multimedia file matching module 302 is configured:

[0098] to separate multimedia audio data from the pre-stored multimedia files, where the multimedia audio data are the audio components in the multimedia files, and the multimedia audio data can be obtained from the multimedia files by separating the audio from the multimedia file, although a detailed description thereof will be omitted here;

[0099] to compare the audio segment data with the audios in the multimedia audio data, and to obtain multimedia audio data matching with the audio segment data; and

[00100] to obtain a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

[00101] The audio segment data can be matched as a result of direct audio comparison without being converted into other data to thereby dispense with the steps of data conversion, and achieve higher accuracy.

[00102] Preferably in some alternative embodiments, the multimedia files include movies, music, and/or teleplays, and even advertisements.

[00103] Since music episodes may appear in movies, advertisements, and teleplays, if the audio segment data are exactly a segment of some music, and the segment of the music also appears in a movie, a teleplay, or an advertisement, then there will be more than one matching results.

[00104] Thus the multimedia file matching module 302 is further configured:

[00105] to determine whether the number of the multimedia files matching with the audio segment data is more than or equal to 2;

[00106] if the number of the multimedia files matching with the audio segment data is more than or equal to 2, to obtain new audio segment data detected by the target terminal, where the new audio segment data can be the next piece of audio segment data immediately succeeding to the audio segment data; and of course, the new audio segment data can alternatively be a still next audio segment data succeeding to the audio segment data, etc., as long as a matching result can be obtained;

[00107] to match the new audio segment data together with the audio segment data with the pre-stored multimedia file, and to obtain a new multimedia file matching with both the new audio segment data and the audio segment data;

[00108] to determine whether the number of the new multimedia files is more than or equal to 2; and

[00109] if the number of the new multimedia files is 1, to replace the new multimedia file with the multimedia file matching with the audio segment data.

[00110] With the embodiment above, if there is more than one matching multimedia file, then only one matching multimedia file will be determined to thereby improve the accuracy in the subsequent steps of analyzing the multimedia file for the interest feature.

[00111] Optionally in some embodiments, the interest feature analyzing module 304 is configured:

[00112] to obtain corresponding category information and tag information by analyzing the file information obtained in each of the preset period of time, where the category information can include but will not be limited to level-1 category information and level-2 category information of the multimedia file, and the tag information can include but will not be limited to a tag preset by the operator of the multimedia file, a tag preset for the multimedia file by a user, etc.;

[00113] to assign the corresponding category information and tag information with weights varying with time when the file information is obtained, that is, there are a lower weight for the temporally older file information, and a higher weight for the temporally newer file information; and

[00114] to obtain the interest feature of the target terminal by calculating with reference to the category information and the tag information in the file information obtained in the preset period of time and the corresponding weights, where the interest feature can be a function of the category information and the tag information which is respective parameters with a feature vector of their weights so that data can be subsequently recommended based upon the interest feature by matching directly the feature vector with the feature vectors of the multimedia files to thereby obtain the matching multimedia file.

[00115] Preferably in some alternative embodiments, the apparatus for recommending data further includes:

[00116] a key audio segment parsing module 306 configured to obtain key audio segment data by parsing the pre-stored multimedia files;

[00117] a picture and text information associating module 307 configured to associate the key audio segment data with key picture and text information;

[00118] a key audio segment matching module 308 configured to determine whether the audio segment data match with the key audio segment data; and

[00119] a picture and text information pushing module 309 configured, if the audio segment data match with the key audio segment data, to push the key picture and text information associated with the key audio segment data to the target terminal;

[00120] where the key audio segment data refer to audio segment data, appearing at one or more positions in the multimedia file, which can be associated with the key picture and text information, and if the multimedia file is played to the position of the key audio segment data, then the audio segment data acquired at this time will exactly match with the key audio segment data so that the network server side is triggered to push the key picture and text information associated with the key audio segment data to the target terminal; and the key picture and text information can be a segment of video, a segment of music, a segment of animation, a segment of advertisement, etc.

[00121] The key audio segment data and the associated key picture and text information are set so that if the audio segment data matching with the key audio segment data appear in the multimedia file being watched on the target terminal, then some key picture and text information which may be interesting to the user or can improve the favor of the user can be pushed to the user, so that the watching user will not feel dull and tired, and can be provided with additional information.

[00122] Fig. 4 illustrates a storage medium processing apparatus. As shown in Fig. 4, the storage medium processing apparatus includes a central processing unit (CPU) 71, a storage medium 72, and a bus 73 that connects the CPU 71 and the storage medium 72. The storage medium 72 may store the computer executable instructions. When the computer executable instructions are executed by the CPU 71, the apparatus may perform the methods disclosed in this disclosure.

[00123] Those skilled in the art can appreciate that the description of any embodiment above is merely illustrative, but not intended to suggest that the scope of the disclosure (including the claims) be limited to these examples; and the embodiments, or the technical features in different embodiments can be combined with each other, the steps can be performed in any appropriate order, and there are numerous other possible variations of the different aspects of the disclosure as described above, without departing from the scope of the disclosure, although they have not been described here in details for the sake of conciseness.

[00124] Furthermore for the sake of a concise description and discussion, and in order not to obscure the disclosure, well-known power supply/ground connections of Integrated Circuit (IC) chips and other components may or may not be illustrated in the drawings. Moreover the apparatus can be illustrated in block diagrams so as not to obscure the disclosure, and also takes into account such a fact that the details of the implementations of the apparatus in the block diagrams are highly determined by the platform on which the disclosure will be put into practice (that is, all of the details shall fall into the scope understandable by those skilled in the art). If

particular details (e.g., circuits) are set forth for the description of an exemplary embodiment of the disclosure, then it will be obvious to those skilled in the art that the disclosure can be put into practice without the particular details or with some change to the particular details. Accordingly such a description shall be construed to be illustrative but not limiting.

5 **[00125]** Although the disclosure has been described in connection with the particular embodiments thereof, numerous substitutions, modifications, and variations of these embodiments will be obvious to those skilled in the art. For example, other memory architectures (e.g., a dynamic RAM (DRAM)) can use the embodiments described above.

10 **[00126]** The present disclosure may include dedicated hardware implementations such as application specific integrated circuits, programmable logic arrays and other hardware devices. The hardware implementations can be constructed to implement one or more of the methods described herein. Applications that may include the apparatus and systems of various examples can broadly include a variety of electronic and computing systems. One or more examples described herein may implement functions using two or more specific interconnected
15 hardware modules or devices with related control and data signals that can be communicated between and through the modules, or as portions of an application-specific integrated circuit. Accordingly, the computing system disclosed may encompass software, firmware, and hardware implementations. The terms "module," "sub-module," "unit," or "sub-unit" may include memory (shared, dedicated, or group) that stores code or instructions that can be executed by
20 one or more processors.

[00127] The embodiments of the disclosure are intended to encompass all such substitutions, modifications, and variations falling into the broad scope of the appended claims. Accordingly any omissions, modifications, equivalent substitutions, adaptations, etc., made thereto without departing from the spirit and principle of the disclosure shall fall into the scope of the disclosure
25 as claimed.

CLAIMS

1. A method for recommending data, wherein the method is applicable to a network server side and comprises:

- 5 obtaining constantly audio segment data detected by a target terminal;
- comparing each piece of the audio segment data with audios in pre-stored multimedia files, and obtaining a multimedia file matching with each piece of the audio segment data;
- obtaining file information of the multimedia file successfully matched in a preset period of time;
- 10 obtaining an interest feature of the target terminal by analyzing the file information obtained in the preset period of time; and
- extracting and pushing to the target terminal a multimedia file matching with the interest feature of the target terminal.

- 15 2. The method according to claim 1, wherein the step of comparing each piece of the audio segment data with the audios in the pre-stored multimedia files, and obtaining the multimedia file matching with each piece of the audio segment data comprises:

- separating multimedia audio data from the pre-stored multimedia files;
- comparing the audio segment data with audios in the multimedia audio data, and obtaining
- 20 multimedia audio data matching with the audio segment data; and
- obtaining a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

- 25 3. The method according to claim 1, wherein the multimedia files comprise movies, music, and/or teleplays; and

- after the step of comparing each piece of the audio segment data with the audios in the pre-stored multimedia files, and obtaining the multimedia file matching with each piece of the audio segment data, the method further comprises:

- 30 determining whether the number of the multimedia files matching with the audio segment data is more than or equal to 2;

if the number of the multimedia files matching with the audio segment data is more than or equal to 2, then obtaining new audio segment data detected by the target terminal;

matching the new audio segment data together with the audio segment data with the pre-stored multimedia files, and obtaining a new multimedia file matching with both the new
5 audio segment data and the audio segment data;

determining whether the number of the new multimedia files is more than or equal to 2; and

if the number of the new multimedia files is 1, then replacing the new multimedia file with the multimedia file matching with the audio segment data.

10 4. The method according to claim 1, wherein the step of obtaining the interest feature of the target terminal by analyzing the file information obtained in the preset period of time comprises:

obtaining corresponding category information and tag information by analyzing the file information obtained in each of the preset period of time;

15 assigning the corresponding category information and tag information with weights varying with time when the file information is obtained; and

obtaining the interest feature of the target terminal by calculating with reference to the category information and the tag information in the file information obtained in the preset period of time and the corresponding weights.

20 5. The method according to claim 1, wherein, before the step of obtaining constantly the audio segment data detected by the target terminal, the method further comprises:

obtaining key audio segment data by parsing the pre-stored multimedia files;

associating the key audio segment data with key picture and text information; and

25 after the step of obtaining constantly audio segment data detected by a target terminal, the method further comprises:

determining whether the audio segment data match with the key audio segment data; and

if the audio segment data match with the key audio segment data, then pushing the key picture and text information associated with the key audio segment data to the target terminal.

30 6. An apparatus for recommending data, comprising:

an audio segment data obtaining module configured to obtain constantly audio segment data detected by a target terminal;

5 a multimedia file matching module configured to compare each piece of the audio segment data with audios in pre-stored multimedia files, and to obtain a multimedia file matching with each piece of the audio segment data;

a file information obtaining module configured to obtain file information of the multimedia file successfully matched in a preset period of time;

an interest feature analyzing module configured to obtain an interest feature of the target terminal by analyzing the file information obtained in the preset period of time; and

10 a multimedia file pushing module configured to extract and push to the target terminal a multimedia file matching with the interest feature of the target terminal.

7. The apparatus according to claim 6, wherein the multimedia file matching module is configured to:

15 separate multimedia audio data from the pre-stored multimedia files;

compare the audio segment data with audios in the multimedia audio data, and to obtain multimedia audio data matching with the audio segment data; and

obtain a corresponding multimedia file according to the multimedia audio data matching with the audio segment data.

20 8. The apparatus according to claim 6, wherein the multimedia files comprise movies, music, and/or teleplays; and

the multimedia file matching module is further configured to:

25 determine whether the number of the multimedia files matching with the audio segment data is more than or equal to 2;

if the number of the multimedia files matching with the audio segment data is more than or equal to 2, obtain new audio segment data detected by the target terminal;

30 match the new audio segment data together with the audio segment data with the pre-stored multimedia files, and to obtain a new multimedia file matching with both the new audio segment data and the audio segment data;

determine whether the number of the new multimedia files is more than or equal to 2; and

if the number of the new multimedia files is 1, replace the new multimedia file with the multimedia file matching with the audio segment data.

5 9. The apparatus according to claim 6, wherein the interest feature analyzing module is configured to:

obtain corresponding category information and tag information by analyzing the file information obtained in each of the preset period of time;

10 assign the corresponding category information and tag information with weights varying with time when the file information is obtained; and

obtain the interest feature of the target terminal by calculating with reference to the category information and the tag information in the file information obtained in the preset period of time and the corresponding weights.

15 10. The apparatus according to claim 6, wherein the apparatus further comprises:

a key audio segment parsing module configured to obtain key audio segment data by parsing the pre-stored multimedia files;

a picture and text information associating module configured to associate the key audio segment data with key picture and text information;

20 a key audio segment matching module configured to determine whether the audio segment data match with the key audio segment data; and

a picture and text information pushing module configured, if the audio segment data match with the key audio segment data, to push the key picture and text information associated with the key audio segment data to the target terminal.

25

11. An electronic device for recommending data, comprising:

at least one processor; and

30 a memory communicably connected with the at least one processor for storing instructions executable by the at least one processor, wherein execution of the instructions by the at least one processor causes the at least one processor to perform a method according to any one of claims 1 to 5.

12. A non-transitory computer-readable storage medium storing executable instructions for recommending data, wherein the instructions, when executed by an electronic device, cause the electronic device to perform a method according to any one of claims 1 to 5.

5

13. A computer program product for recommending data, the computer program product comprising a computer program stored on a non-transitory computer-readable storage medium, the computer program comprising program code which, when executed on a computer, causes the computer to perform a method according to any one of claims 1 to 5.

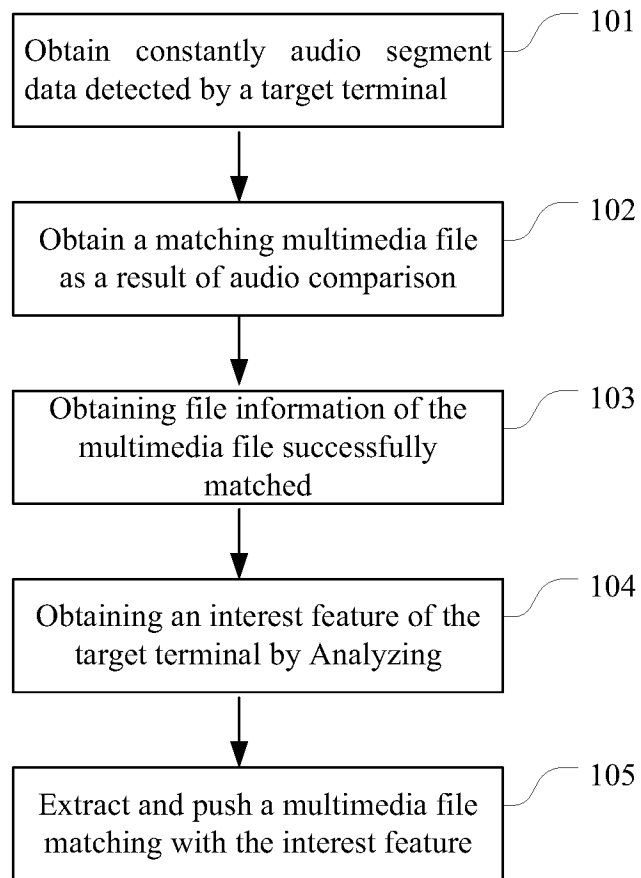


Fig. 1

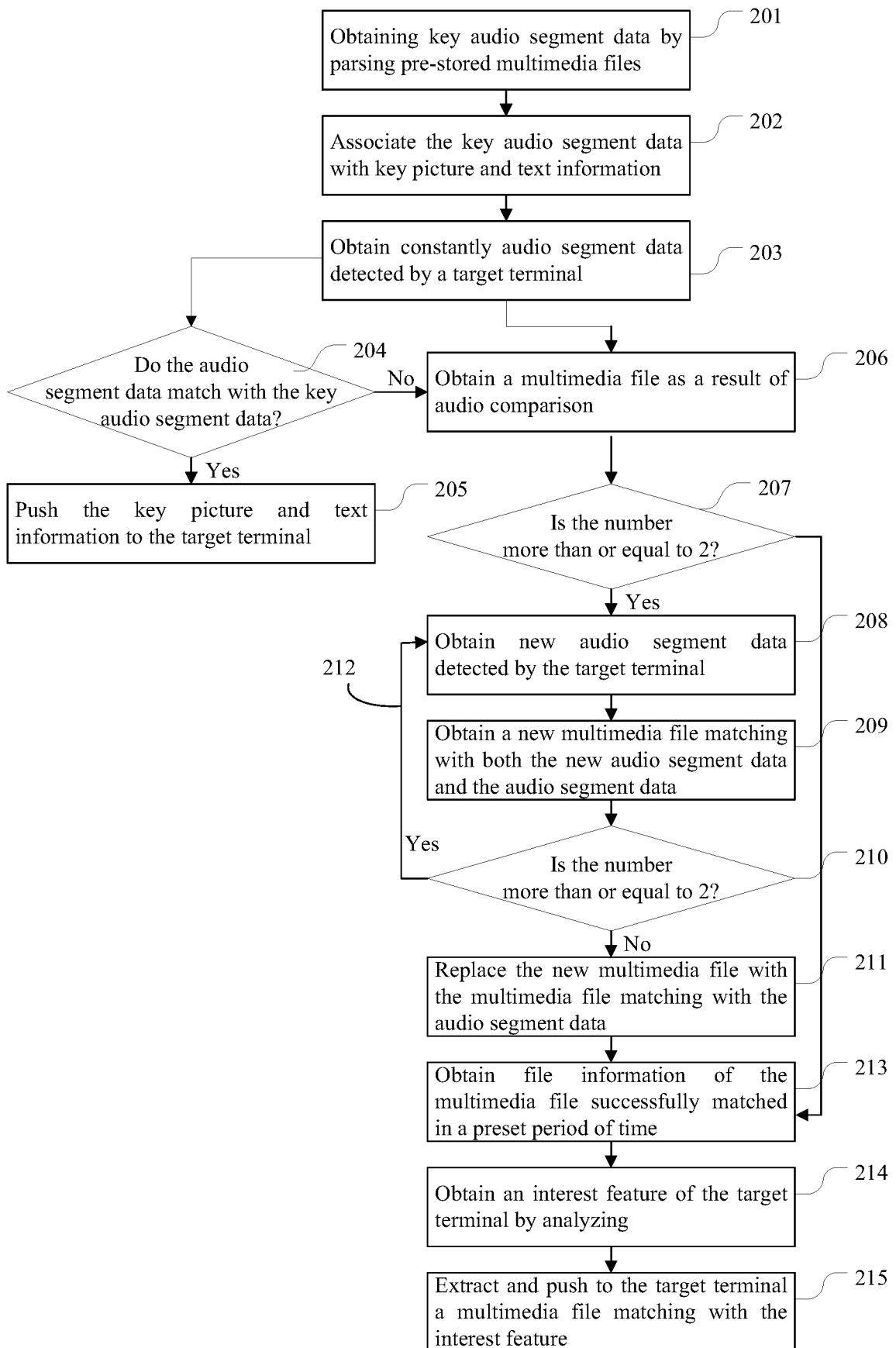


Fig. 2

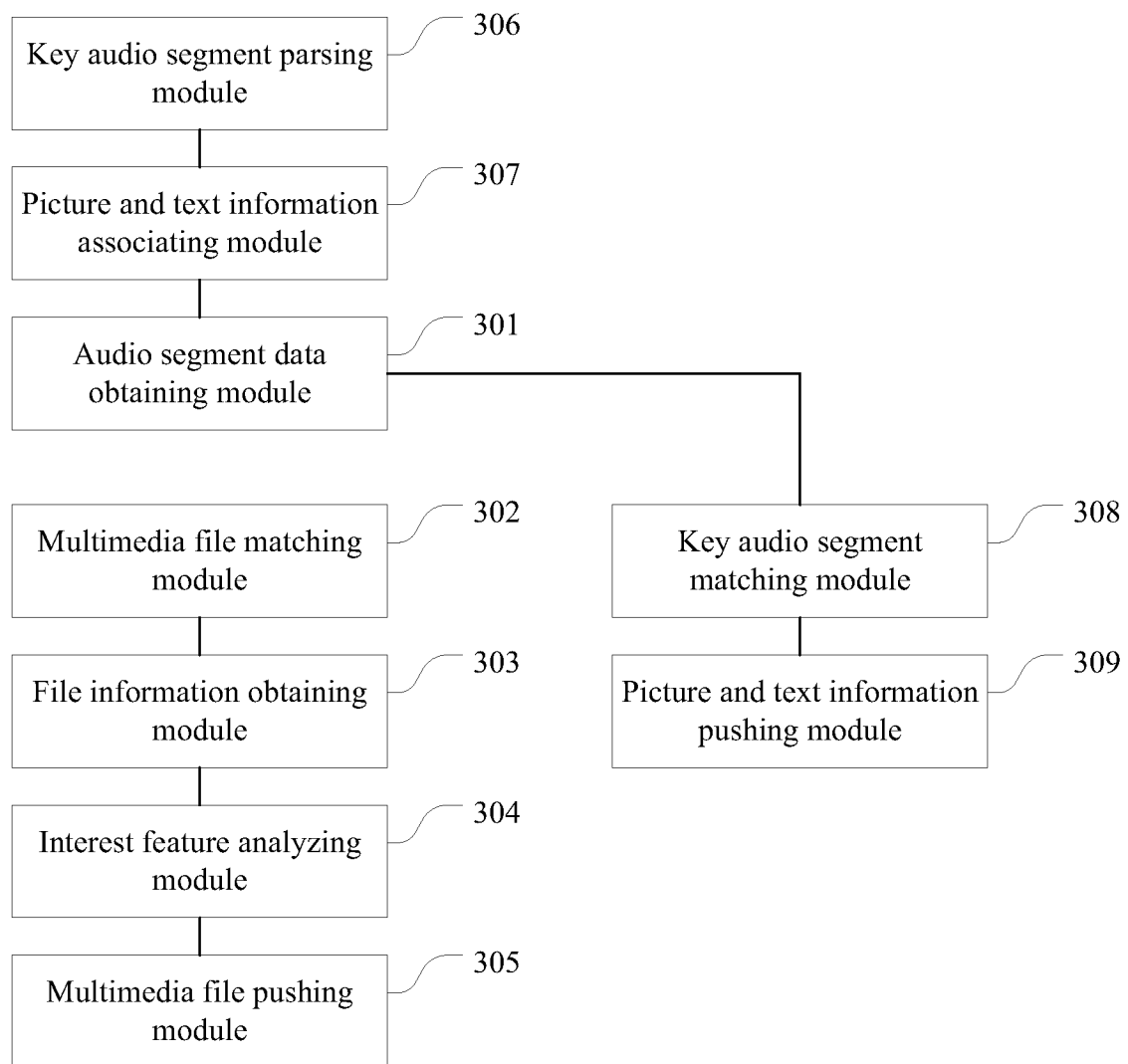


Fig. 3

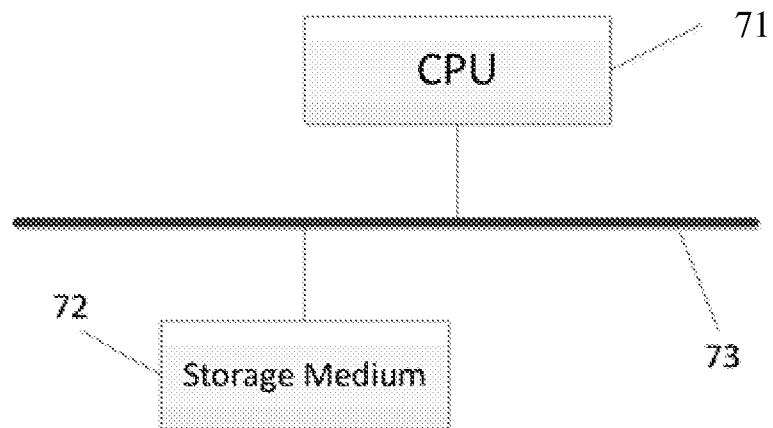


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2017/077618

A. CLASSIFICATION OF SUBJECT MATTER

H04N 21/25(2011.01)i; H04N 21/233(2011.01)i; H04N 21/258(2011.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N21

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS;CNTXT;VEN;CNKI;DWPI: audio, video, stream, track, segment, media, feature, file, recommend+, push+, match+, compar+, piece, equal, value

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	CN 103021440 A (TENCENT TECHNOLOGY SHENZHEN CO., LTD.) 03 April 2013 (2013-04-03) description, paragraphs [0085]-[0130]	1-13
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A	US 2011246495 A1 (SONY COMP ENTERTAINMENT INC.) 06 October 2011 (2011-10-06) the whole document	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

06 June 2017

Date of mailing of the international search report

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Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2017/077618

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