

METHOD, APPARATUS, ELECTRONIC DEVICE, AND STORAGE MEDIUM FOR GENERATING BULL'S EYE PLOT

RELATED APPLICATIONS

[0001] The present disclosure claims priority to Chinese patent application No. CN202410547078.9, filed on May 6, 2024, and entitled “METHOD, APPARATUS, ELECTRONIC DEVICE, AND STORAGE MEDIUM FOR GENERATING BULL'S EYE PLOT”, the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of computer technology, and in particular to, a method, an apparatus, an electronic device, and a storage medium for generating a bull's eye plot.

BACKGROUND

[0003] For a patent search result, plots such as a heatmap and a stacked plot, etc., are generally adopted to present the search result. These plots have some defects in conveying information and are primarily restricted to the ability for manifesting three-dimensional information, that is, information of the X-axis, Y-axis, and the number are merely conveyed, and detailed data composition and important data dimension can't be displayed. In addition, the heatmap and the stacked plot are not intuitive to present complex data structure and fail to meet the comprehensive needs of four or higher-dimensional information. Therefore, the current product for visualizing the search result has the defects of limited information expression and poor user experience.

SUMMARY

[0004] In view of this, embodiments of the present disclosure provide a method, an apparatus, an electronic device, and a storage medium for generating a bull's eye plot.

[0005] According to a first aspect of the embodiments of the present disclosure, a method for generating a bull's eye plot is proposed. The method includes:

[0006] acquiring a plurality of data results;

[0007] configuring sectors of the bull's eye plot based on at least one first classification of the plurality of data results;

[0008] configuring concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, where a span of each sector is determined based on a weighted value obtained by weighting a first number of the data results respectively included by all sub-concentric rings within the sector; and

[0009] configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

[0010] In some embodiments, a weight of the first number is determined according to the second classification of a sub-concentric ring corresponding to the first number.

[0011] In some embodiments, the method further includes:

[0012] determining a second number of image identifiers configurable in each of the sub-concentric rings based on space occupied by each of the sub-concentric rings and space occupied by the image identifier of the data results within the sector,

[0013] the step of configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector includes at least one of the following:

[0014] in response to the second number corresponding to a first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring within the sector, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring; and

[0015] in response to the second number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring within the sector, identifying the first number corresponding to the first sub-concentric ring within the first sub-concentric ring.

[0016] In some embodiments, the method also includes:

[0017] determining a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring,

[0018] the step of configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring includes:

[0019] in response to the third number corresponding to the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric

ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring; and

[0020] in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, evenly configuring the image identifiers of the data results corresponding to the first sub-concentric ring within N circumferential rows of the first sub-concentric ring.

[0021] In some embodiments, the method also includes:

[0022] configuring a text identifier corresponding to a data result for at least one image identifier.

[0023] In some embodiments, the step of configuring a text identifier corresponding to a data result for at least one image identifier includes:

[0024] sequentially configuring the text identifier in at least one preset candidate position of the image identifier;

[0025] determining a first preset candidate position of the at least one preset candidate position satisfying a collision condition as a target position for placing the text identifier; and

[0026] placing the text identifier at the target position,

[0027] the satisfying a collision condition includes at least one of the following: space occupied by the text identifier does not overlap with occupied space in the bull's eye plot, and an overlapping portion between the space occupied by the text identifier and the occupied space in the bull's eye plot is less than a predetermined value.

[0028] In some embodiments, the method also includes:

[0029] in response to all preset candidate positions of the image identifier not satisfying the collision condition, not configuring a corresponding text identifier for the image identifier.

[0030] In some embodiments, the occupied space in the bull's eye plot includes at least one of the following:

[0031] space occupied by any predetermined text in the bull's eye plot;

[0032] space occupied by any image identifier in the bull's eye plot; and

[0033] space occupied by any text identifier in the bull's eye plot.

[0034] In some embodiments, the method also includes:

[0035] configuring a connecting line identifier between a first image identifier and a text identifier corresponding to the first image identifier in the image identifiers in response to satisfying at least one of the following:

[0036] a distance between the first image identifier and a second image identifier in the image identifiers is less than a first threshold;

[0037] a distance between the first image identifier and the text identifier corresponding to the first image identifier is greater than a second threshold; and

[0038] a distance between the first image identifier and a text identifier corresponding to the second image identifier is less than a third threshold.

[0039] According to a second aspect of the present disclosure, an apparatus for generating a bull's eye plot is proposed. The apparatus includes:

[0040] a transceiver module, configured to acquire a plurality of data results; and

[0041] a processing module, configured to configure sectors of the bull's eye plot based on at least one first classification of the plurality of data results,

[0042] configure concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, where a span of each sector is determined based on a weighted value obtained by weighting a first number of data results respectively included by all sub-concentric rings within the sector, and

[0043] configure image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

[0044] In some embodiments, a weight of the first number is determined according to the second classification of a sub-concentric ring corresponding to the first number.

[0045] In some embodiments, the processing module is also configured to:

[0046] determine a second number of image identifiers configurable in each of the sub-concentric rings based on space occupied by each of the sub-concentric rings and space occupied by the image identifiers of data results within the sector.

[0047] The processing module is specifically configured for at least one of the following:

[0048] in response to the second number corresponding to a first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring within the sector, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring; and

[0049] in response to the second number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring within the sector, identifying the first number corresponding to the first sub-concentric ring within the first sub-concentric ring.

[0050] In some embodiments, the processing module is also configured to:

[0051] determine a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring,

[0052] the processing module is specifically configured to perform at least one of the following:

[0053] in response to the third number corresponding to the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring; and

[0054] in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, evenly configuring the image identifiers of the data results corresponding to the first sub-concentric ring within N circumferential rows of the first sub-concentric ring.

[0055] In some embodiments, the processing module is also configured to:

[0056] configure a text identifier corresponding to a data result for at least one image identifier.

[0057] In some embodiments, the processing module is specifically configured to:

[0058] sequentially configure the text identifier in at least one preset candidate position of the image identifier;

[0059] determine a first preset candidate position of the at least one preset candidate position satisfying a collision condition as a target position for placing the text identifier; and

[0060] place the text identifier at the target position,

[0061] the satisfying a collision condition includes at least one of the following: space occupied by the text identifier does not overlap with occupied space in the bull's eye plot; and an overlapping portion between the space occupied by the text identifier and the occupied space in the bull's eye plot is less than a predetermined value.

[0062] In some embodiments, the processing module is also configured to:

[0063] in response to all preset candidate positions of the image identifier not satisfying the collision condition, not configure a corresponding text identifier for the image identifier.

[0064] In some embodiments, the occupied space in the bull's eye plot includes at least one of the following:

[0065] space occupied by any predetermined text in the bull's eye plot;

[0066] space occupied by any image identifier in the bull's eye plot; and

[0067] space occupied by any text identifier in the bull's eye plot.

[0068] In some embodiments, the processing module is also configured to:

[0069] configure a connecting line identifier between a first image identifier and a text identifier corresponding to the first image identifier in the image identifiers in response to satisfying at least one of the following:

[0070] a distance between the first image identifier and a second image identifier in the image identifiers is less than a first threshold;

[0071] a distance between the first image identifier and the text identifier corresponding to the first image identifier is greater than a second threshold; and

[0072] a distance between the first image identifier and a text identifier corresponding to the second image identifier is less than a third threshold.

[0073] According to a third aspect of the present disclosure, an electronic device is proposed. The electronic device includes:

[0074] one or more processors;

[0075] where, the processor is configured to invoke instructions to cause the electronic device to execute the method for generating the bull's eye plot described in the first aspect.

[0076] According to a fourth aspect of the present disclosure, a storage medium is proposed. The storage medium stores instructions that, when run on an electronic device, cause the electronic device to execute the method for generating the bull's eye plot described in the first aspect.

[0077] According to embodiments of the present disclosure, the method for generating the bull's eye plot includes: acquiring a plurality of data results; configuring sectors of the bull's eye plot based on at least one first classification of the plurality of data results; configuring concentric rings of the bull's eye plot based on at least one second classification

of the plurality of data results, where a span of each sector is determined based on a weighted value obtained by weighting a first number of the data results respectively included by all sub-concentric rings within the sector; and configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector. In this way, by determining the span of the sector based on the weighted value of the data results in different sub-concentric rings within the sector, so that the bull's eye plot can meet the demand of the number of data results for the span of the sector and the demand of the priorities of different data results, thereby making the expression of the bull's eye plot more intuitive and clear.

BRIEF DESCRIPTION OF DRAWINGS

[0078] FIG. 1 is a schematic flowchart illustrating a method for generating a bull's eye plot according to an exemplary embodiment;

[0079] FIG. 2 is a schematic diagram illustrating a bull's eye plot according to an exemplary embodiment;

[0080] FIG. 3 is a schematic diagram illustrating a bull's eye plot according to an exemplary embodiment;

[0081] FIG. 4 is a schematic flowchart illustrating a method for generating a bull's eye plot according to an exemplary embodiment;

[0082] FIG. 5 is a schematic diagram illustrating a bull's eye plot according to an exemplary embodiment;

[0083] FIG. 6 is a schematic flowchart illustrating a method for generating a bull's eye plot according to an exemplary embodiment;

[0084] FIG. 7 is a schematic diagram illustrating a bull's eye plot according to an exemplary embodiment;

[0085] FIG. 8 is a schematic flowchart illustrating a method for generating a bull's eye plot according to an exemplary embodiment;

[0086] FIG. 9 is a schematic diagram illustrating a text identifier according to an exemplary embodiment;

[0087] FIG. 10 is a schematic diagram illustrating a text identifier collision according to

an exemplary embodiment;

[0088] FIG. 11 is a schematic flowchart illustrating a method for generating a bull's eye plot according to an exemplary embodiment;

[0089] FIG. 12 is a schematic diagram illustrating a bull's eye plot according to an exemplary embodiment;

[0090] FIG. 13 is a schematic structural diagram illustrating an apparatus for generating a bull's eye plot according to an exemplary embodiment; and

[0091] FIG. 14 is a schematic structural diagram illustrating an electronic device according to an exemplary embodiment.

DETAILED DESCRIPTION

[0092] To make the technical solution and beneficial effects of the present disclosure clearer and more understandable, detailed description will be given in the following by listing specific embodiments. The drawings may be not drawn to scale, and a local feature may be enlarged or reduced to more clearly show details of the local feature. Unless otherwise defined, the technical and scientific terms used herein have the same meanings as those in the field to which the present disclosure belongs.

[0093] The embodiments of the present disclosure are not exhaustive, are only illustrative of part of embodiments, and are not intended to limit the protection scope of the present disclosure. In a case without conflict, each step in an embodiment can be implemented as an independent embodiment, and the steps can be combined arbitrarily. For example, a solution obtained by removing part of steps from an embodiment can also be implemented as an independent embodiment, and the order of steps in an embodiment can be arbitrarily exchanged. In addition, optional implementations in an embodiment may be arbitrarily combined. Furthermore, the embodiments may be arbitrarily combined with each other, e.g., part or all of steps of different embodiments may be arbitrarily combined, and an embodiment may be arbitrarily combined with an optional implementation in other embodiments.

[0094] In the embodiment of the present disclosure, unless otherwise specified or in case of logical conflict, the terms and/or descriptions in various embodiments are consistent and can be referenced mutually. Technical features in different embodiments can be combined

to form a new embodiment based on their inherent logical relationships.

[0095] The terms used in the embodiment of the present disclosure are for the purpose of describing specific embodiments and are not intended to limit the present disclosure.

[0096] In the embodiments of the present disclosure, unless otherwise specified, an element expressed in a singular form, such as “a,” “an,” “the,” “said,” “above-mentioned,” “aforementioned,” or “this,” etc., can represent “one and only one,” “one or more,” or “at least one,” etc. For example, in a case that an English article such as “a,” “an,” or “the” is used in translation, the noun following the article can be understood as a singular form or a plural form.

[0097] In the embodiment of the present disclosure, “a plurality of” means two or more.

[0098] In some embodiments, terms such as “at least one of,” “one or more,” “a plurality of,” and “multiple,” etc., can be used interchangeably.

[0099] In some embodiments, expressions such as “at least one of A and B,” “A and/or B,” “in one case A, in another case B,” and “one case A, another case B,” etc., can include the following technical solutions according to cases: in some embodiments, A (executing A independently of B); in some embodiments, B (executing B independently of A); in some embodiments, selectively executing A or B (A and B are selectively executed); and in some embodiments, both A and B (both A and B are executed). When there are more branches such as A, B, C, etc., it is similar to the above-mentioned cases.

[0100] In some embodiments, the wording “A or B” and the like includes the following technical solutions according to occasions: in some embodiments, A (executing A independently of B); in some embodiments, B (executing B independently of A); in some embodiments, selectively executing A or B (A and B are selectively executed). When there are more branches such as A, B, C, etc., it is similar to the above-mentioned cases.

[0101] In the embodiment of the present disclosure, prefixes such as “first,” “second,” etc., are only used to distinguish different described objects and do not limit the position, order, priority, value, or content of described objects. Interpretation of the described objects shall refer to the claims or the context in the embodiments and should not be construed as additional limitations due to the use of the prefixes. For example, the described object is a “field,” the ordinal numbers before “field” in “first field” and “second field” do not limit the position or order of the field, and “first” and “second” do not limit the fields are in the

same message or the order of the fields. For another example, the object is a “level,” the ordinal numbers before “level” in “first level” and “second level” do not limit the priority between the levels. For yet another example, a value of the described object is not limited by the ordinal number and can be one or more. Taking a first apparatus as an example, a value of the apparatus can be one or more. In addition, objects modified by different prefixes can be the same or different. For example, the described object is a “apparatus,” and “first apparatus” and “second apparatus” can be the same apparatus or different apparatuses, and types of them can be the same or different. For another example, the described object is “information,” and “first information” and “second information” can be the same information or different information, and their contents can be the same or different.

[0102] In some embodiments, “comprise A,” “include A,” “indicate A,” and “carry A” etc., can be interpreted as either directly carrying A or indirectly indicating A.

[0103] In some embodiments, terms such as “...,” “determining...,” “in a case that...,” “when...,” “upon...,” “in the event that...,” “if...,” etc., can be used interchangeably.

[0104] In some embodiments, terms such as “greater than,” “greater than or equal to,” “not smaller than,” “more than,” “more than or equal to,” “not less than,” “higher than,” “higher than or equal to,” “not lower than,” “or more,” etc., can be used interchangeably. Terms such as “smaller than,” “smaller than or equal to,” “not greater than,” “less than,” “less than or equal to,” “not more than,” “lower than,” “lower than or equal to,” “not higher than,” “or less,” etc., can be used interchangeably.

[0105] In some embodiments, an apparatus, etc., can be interpreted as either physical or virtual, and its name is not limited to the name recited in the embodiments. Terms such as “apparatus,” “equipment,” “device,” “circuit,” “cell,” “node,” “function,” “unit,” “section,” “system,” “network,” “chip,” “chip system,” “entity,” “subject,” etc., can be used interchangeably.

[0106] In addition, each element, row, or column in a table of the embodiment of the present disclosure can be implemented as an independent embodiment, and the combination of any element, any row, or any column can also be implemented as an independent embodiment.

[0107] A bull’s eye plot is a type of plot that combines a sector and a concentric ring to

present data features. A specific data point or a data set is displayed in highlight through different colors, shapes, or other visual elements, thereby providing an intuitive and visual manner to present and analyze data. By observing data on the concentric ring, a user can quickly determine the overall trend and distribution of the data. The bull's eye plot is generally used in the drug pipeline and clinical trial data analysis, it can comprehensively and intuitively manifest multi-dimensional information, and elegantly and friendly present large-scale search results.

[0108] How to use the bull's eye plot to clearly represent a data result, such as a patent search result, is an urgent problem to be solved.

[0109] As shown in FIG. 1, an embodiment of the present disclosure relates to a method for generating a bull's eye plot. The method includes:

[0110] Step 101: acquiring a plurality of data results;

[0111] Step 102: configuring sectors of the bull's eye plot based on at least one first classification of the plurality of data results;

[0112] Step 103: configuring concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, where a span of each sector is determined based on a weighted value obtained by weighting a first number of the data results respectively included by all sub-concentric rings within the sector; and

[0113] Step 104: configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

[0114] The method provided in this embodiment may be executed by an electronic device such as a computer, etc.

[0115] Here, the bull's eye plot may be a graphical presentation manner, in which the sector with a specific shape is used to indicate one dimension distribution of the data results, and the concentric ring with the specific shape is used to indicate another dimension distribution of the data results. The present disclosure does not limit the name of the bull's eye plot. The specific shape may be circular, polygonal, etc., which is not limited herein.

[0116] The data results may include a search result obtained through searching or other manners, which are not limited to this. For example, the data results may include a patent search result obtained by searching patents.

[0117] In a possible implementation, the plurality of data results may be classified in at least two classification manners. The plurality of data results may be divided into one or more data results corresponding to at least one first classification based on a first classification manner, and the plurality of data results may also be divided into one or more data results corresponding to at least one second classification based on a second classification manner.

[0118] Exemplarily, the data results may be patent search results for drugs. The searched drugs may be classified based on the drug type (i.e., the first classification manner), and a plurality of the first classifications of the search results are obtained, such as a small-molecule drug, a biosimilar, an antibody, a tri-specific antibody, etc. The searched drugs may also be classified based on a development stage (i.e., the second classification manner), and the plurality of second classifications of the search results, such as a preclinical drug, a phase 1 clinical drug, a phase 2 clinical drug, etc. Here, the first and second classification manners are not limited to the above-mentioned classification manners. For example, the first classification manner may also include a classification based on the country of the origin of the drug, a classification based on the owner of the drug, etc., which are not exhaustively listed herein. The second classification manner may also include a classification based on the year that the drug patent was filed, a classification based on the legal status of the drug patent, etc., which are not exhaustively listed herein.

[0119] Here, each first classification obtained by classifying the data results may be used as one sector of the bull's eye plot, and each second classification obtained by classifying the data results may be used as one concentric ring of the bull's eye plot. A sub-concentric ring may refer to the portion of a complete concentric ring in the sector in the bull's eye plot.

[0120] A data result in the bull's eye plot can be represented by an image identifier. The image identifier may be configured in a sub-concentric ring of the second classification in a sector of the first classification corresponding to the data result. A user can determine the first and second classifications of the data result corresponding to the image identifier according to the sector and the sub-concentric ring of the image identifier in the bull's eye plot.

[0121] In a possible implementation, the data results in the bull's eye plot may use the same image identifier. For example, the data results in the bull's eye plot may use the same dot as the image identifier.

[0122] In a possible implementation, a third classification manner may be used to classify the data results in the bull's eye plot. Data results with different third classifications may have different image identifiers. For example, image identifiers with different colors may be used to distinguish data results of different third classifications.

[0123] The span of the sector may include one of the following: an angle of the sector; and a width of the sector.

[0124] Here, the first number of data results in each sub-concentric ring in the sector (i.e., the number of image identifiers to be placed in each sub-concentric ring) may be firstly determined, and then the weighted value of the first number of each sub-concentric ring may be determined. The search result is obtained by weighting the first number of data results in all sub-concentric rings within the sector.

[0125] In a possible implementation, a weight corresponding to the first number of the data results in the sub-concentric ring may be preset.

[0126] In a possible implementation, the weight corresponding to the first number of the data results in the sub-concentric ring within the sector may be determined based on the first classification corresponding to the sector where the sub-concentric ring is located.

[0127] In a possible implementation, the weight corresponding to the first number of the data results in the sub-concentric ring within the sector may be determined based on the priority of the data results.

[0128] In a possible implementation, weights corresponding to the first number of data results in different sub-concentric rings within the sector may be the same or different.

[0129] In a possible implementation, the span of the sector may be divided based on a proportion of a corresponding weighted value to the sum of the weighted values of all sectors in the bull's eye plot.

[0130] In a possible implementation, as shown in FIG. 2, the bull's eye plot may also include a first sector, where each sub-concentric ring in the first sector is used to identify a corresponding second classification.

[0131] In a possible implementation, the span of the sector may be divided based on a proportion of a corresponding weighted value to the sum of the weighted values of all sectors divided in an available interval of the bull's eye plot. For example, the available interval includes a portion of the bull's eye plot excluding the first sector.

[0132] Exemplarily, as shown in FIG. 2, a weighted value of a sector 1 may be expressed by Equation (1):

$$Y_1 = p_1x_1 + p_2x_2 + p_3x_3 \quad (1)$$

[0133] where, Y_1 represents the weighted value of the sector 1, x_1 represents the first number of data results in a sub-concentric ring 1, p_1 represents a weight corresponding to x_1 , x_2 represents the first number of data results in a sub-concentric ring 2, p_2 represents a weight corresponding to x_2 , x_3 represents the first number of data results in a sub-concentric ring 3, and p_3 represents a weight corresponding to x_3 .

[0134] A weighted value of a sector 2 is represented as Y_2 , and a weighted value of a sector 3 is represented as Y_3 . A proportion of the sector 1 in an available interval of the bull's eye plot is the quotient of Y_1 divided by the sum of Y_1 , Y_2 , and Y_3 . As shown in FIG. 2, the available interval is a portion of the bull's eye plot excluding the first sector.

[0135] In this way, the span of the sector is determined through the weighted values of the data results within different sub-concentric rings within the sector, which makes the bull's eye plot meet the demand of the number of the data results for the span of the sector and the demand of the priorities of different data results, and makes the expression of the bull's eye plot more intuitive and clearer.

[0136] In some embodiments, the weight of the first number is determined according to a second classification of a sub-concentric ring corresponding to the first number.

[0137] In a possible implementation, a weight of the second classification may be determined according to the priority of the second classification. For example, the higher the priority of the second classification is, the higher the corresponding weight is.

[0138] Exemplarily, as shown in FIG. 3, to determine a weighted value of each first classification (sector), the weighted value of each first classification may be obtained based on a weight of the second classification corresponding to each sub-concentric ring within the sector and the number of the data results within the each sub-concentric ring, thereby

determining the proportion of each first classification in the plot.

[0139] In this way, the bull's eye plot can meet the demand of the priorities of the data results of different second classifications, thereby making the expression of the bull's eye plot more intuitive and clearer.

[0140] As shown in FIG. 4, an embodiment of the present disclosure relates to a method for generating a bull's eye plot. The method for generating the bull's eyes plot includes:

[0141] Step 401: determining a second number of image identifiers configurable in each of the sub-concentric rings based on space occupied by each of the sub-concentric rings and space occupied by the image identifiers of the data results within the sector, and

[0142] the step of configuring the image identifiers corresponding to the data results within the sub-concentric rings of the sector includes at least one of the following:

[0143] in response to the second number corresponding to a first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring within the sector, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring; and

[0144] in response to the second number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring within the sector, identifying the first number corresponding to the first sub-concentric ring within the first sub-concentric ring.

[0145] In a possible implementation, space occupied by an image identifier includes space of the image identifier itself and interval space between the image identifiers.

[0146] In a possible implementation, the quotient of area of space occupied by a sub-concentric ring divided by area of space occupied by each image identifier may be determined as the second number of the image identifiers configurable within the sub-concentric ring.

[0147] In a possible implementation, the number of the image identifiers configurable in a radial direction of the sub-concentric ring (a radial direction of the bull's eye plot) may be firstly determined. That is, the number of rows of the image identifiers configurable along the radial direction (i.e., the number of circumferential rows) is determined, then the number of the image identifiers configurable in each circumferential row may be

determined, and further the number of the image identifiers configurable in the sub-concentric ring is determined.

[0148] In a possible implementation, the number of rows of the image identifiers configurable in the sub-concentric ring may be firstly determined by dividing a radial width of the sub-concentric ring by a radial size of the space occupied by the image identifiers. Then, the number of the image identifiers configurable in each circumferential row is determined based on a length of each circumferential row divided by a circumferential size of the space occupied by the image identifiers. The second number of the image identifiers configurable in the sub-concentric ring is obtained by summing the number of image identifiers configurable in each circumferential row.

[0149] In a possible implementation, the number of rows of the image identifiers configurable in the sub-concentric ring may be obtained based on a radial width of the sub-concentric ring and a radial size of space occupied by the image identifiers. Then, the number of the image identifiers configurable in each circumferential row is determined based on area of each circumferential row and area of space occupied by the image identifiers. The second number of the image identifiers configurable in the sub-concentric ring is obtained by summing the number of the image identifiers configurable in each circumferential row.

[0150] FIG. 5 manifests the distribution of the maximum number of dots that can be accommodated in each sector ring in a case that identifier dots do not overlap. Where, a dot represents an image identifier, and a colored square represents space occupied by an image identifier when calculating the second number of the image identifiers that can be accommodated in the sector ring. The space occupied by the image identifier includes a size of the image identifier itself and space between adjacent image identifiers.

[0151] Here, the first sub-concentric ring may include any sub-concentric ring in any sector.

[0152] If the second number of data results within the first sub-concentric ring is greater than or equal to the first number of the image identifiers that the first sub-concentric ring can accommodate, that is, the first sub-concentric ring can accommodate all image identifiers of its own data results, and the image identifiers corresponding to the data results may be configured within the first sub-concentric ring.

[0153] If the second number of data results within the first sub-concentric ring is less than the first number of the image identifiers that the first sub-concentric ring can accommodate, that is, the first sub-concentric ring can't accommodate all image identifiers of its own data results, then the second number of the data results can be configured within the first sub-concentric ring. That is, a numerical value of the second number is configured in the first sub-concentric ring.

[0154] In this way, the image identifiers are configured through the accommodating capacity of the sub-concentric ring for accommodating the image identifiers, a case that the image identifiers are configured in the sub-concentric ring when the sub-concentric ring can't accommodate the image identifiers is reduced, thereby improving the clarity of the image identifiers presented in the bull's eye plot.

[0155] As shown in FIG. 6, an embodiment of the present disclosure relates to a method for generating a bull's eye plot. The method for generating the bull's eye plot includes:

[0156] Step 601: determining a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring, and

[0157] the step of configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring includes:

[0158] in response to the third number corresponding to the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring; and

[0159] in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, evenly configuring the image identifiers of the data results corresponding to the first sub-concentric ring within N circumferential rows of the first sub-concentric ring.

[0160] In a possible implementation, as shown in sector 3 of FIG. 7, if the second number of the data results in the first sub-concentric ring is equal to the first number of the image identifiers that the first sub-concentric ring can accommodate, the image identifiers may be uniformly configured within the first sub-concentric ring.

[0161] In a possible implementation, the step of determining a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring

includes at least one of the following:

[0162] determining the third number of the image identifiers configurable within the circumferential row with the shortest length in the first sub-concentric ring;

[0163] determining the third number of the image identifiers configurable within the circumferential row with the longest length in the first sub-concentric ring; and

[0164] determining the third number of the image identifiers configurable in each circumferential row in the first sub-concentric ring.

[0165] The step of in response to the third number corresponding to the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring includes at least one of the following:

[0166] as shown in a sector 1 of FIG. 7, in response to the third number corresponding to a first circumferential row in the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first circumferential row;

[0167] in response to the third number corresponding to i circumferential rows in the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within a first predetermined circumferential row in the i circumferential rows, where i is a total number of the circumferential rows in the first sub-concentric ring, and the first predetermined circumferential row includes a circumferential row in the i circumferential rows, the radial position of which is centered in the i circumferential rows; and

[0168] in response to the third number corresponding to j circumferential rows in the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within a second predetermined circumferential row in the j circumferential rows, where i is the total number of the circumferential rows in the first sub-concentric ring, and j is less than i . The second predetermined circumferential row

includes a circumferential row in the j circumferential rows, the radial position of which is centered in the i circumferential rows.

[0169] The step of configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring includes: configuring the image identifiers at a same interval within the circumferential row. Here, the same interval may include at least one of the following: a same spacing and a same interval angle, where the interval angle is an angle between two image identifiers with a center point of the bull's eye plot as the vertex. Exemplarily, the angle between the image identifiers within the circumferential row is equal to the quotient of a sector angle divided by the first number.

[0170] Here, N is a total number of the circumferential rows in the first sub-concentric ring. The method for determining the number of the circumferential rows is as described above and will not be repeated here.

[0171] In a possible implementation, image identifiers of the first number may be evenly distributed to the N circumferential rows. For example, a value obtained by rounding up the quotient of the first number divided by N can be used as the number of the image identifiers configured in each circumferential row.

[0172] In a possible implementation, as shown in a sector 2 of FIG. 7, the circumferential rows in the first sub-concentric ring may be configured at a same radial spacing. For example, the radial spacing X between the circumferential rows may be expressed by Equation (2):

$$X = (R1 - N * r) / (N + 1) \quad (2)$$

[0173] where, $R1$ represents a radial width of the first sub-concentric ring, r represents a radial size of an image identifier, and N represents the number of the circumferential rows in the first sub-concentric ring.

[0174] In a possible implementation, as shown in sector 2 of FIG. 7, the angle α between the image identifiers within each circumferential row is equal to the quotient of an angle of the first sub-concentric ring divided by the number of data results within the circumferential row as expressed by Equation (3):

$$\alpha = A / n \quad (3)$$

[0175] where, A represents the angle of the first sub-concentric ring, n represents the

number of the data results within the circumferential row (i.e., the number of the image identifiers).

[0176] In a possible implementation, in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, the image identifiers of the data results corresponding to the first sub-concentric ring are randomly configured within the N circumferential rows of the first sub-concentric ring.

[0177] By configuring the image identifiers within the sub-concentric ring based on a predetermined rule, the regularity and clarity of the presentation of the image identifiers are improved.

[0178] As shown in FIG. 8, an embodiment of the present disclosure relates to a method for generating a bull's eye plot. The method includes:

[0179] Step 801: configuring a text identifier corresponding to a data result for at least one image identifier.

[0180] In a possible implementation, the text identifier may be used to represent the data result.

[0181] Exemplarily, the text identifier may include the name of the data result. For instance, the text identifier may include the name of a searched patent drug.

[0182] In some embodiments, the step of configuring a text identifier corresponding to a data result for at least one image identifier includes:

[0183] sequentially configuring the text identifier in at least one preset candidate position of the image identifier;

[0184] determining a first preset candidate position of the at least one preset candidate position satisfying a collision condition as a target position for placing the text identifier; and

[0185] placing the text identifier at the target position,

[0186] where, the satisfying a collision condition includes at least one of the following: space occupied by the text identifier does not overlap with occupied space in the bull's eye plot, and an overlapping portion between the space occupied by the text identifier and the occupied space in the bull's eye plot is less than a predetermined value.

[0187] In some embodiments, the method for generating the bull's eye plot includes: in

response to all preset candidate positions of the image identifier not satisfying the collision condition, not configuring a corresponding text identifier for the image identifier.

[0188] Since the bull's eye plot already contains the text identifier, the image identifier, and the like, collision detection may be performed before configuring the text identifier corresponding to the data result for the image identifier to reduce the overlapping between the text identifier and other content.

[0189] Specifically, a plurality of preset candidate positions capable of configuring text identifiers may be predefined for the image identifiers. The text identifiers are sequentially configured at each preset candidate position, and it is determined whether space occupied by the text identifier collides with other occupied space. The text identifier is configured at a preset candidate position where no collision occurs.

[0190] In a possible implementation, the space occupied by the text identifier includes space of the text identifier itself and interval space between the text identifiers.

[0191] In a possible implementation, the preset candidate position is configured based on the space occupied by the text identifier.

[0192] In a possible implementation, the space occupied by the text identifier includes the space of the text identifier itself and the interval space between the text identifiers.

[0193] Exemplarily, as shown in FIG. 9, the image identifier may be a dot identifier, and eight positions around the dot identifier may be configured as the preset candidate positions. In a practical application, a possible position for the text identifier may be found by traversing a 3x3 matrix of the image identifier. Based on a center coordinate of the image identifier (point p in FIG. 9), a radius of the identifier dot, and an interval between the identifier dot and the text, nine positions around the identifier dot are generated, as shown by black dots in FIG. 9. The center position p is dedicated to displaying the identifier dot without generating a text position. Regarding other positions, offsets are made in the x and y directions according to indices of rows and columns in the matrix where they are located and a width and a height of the text, to generate corresponding text positions. To ensure that a distance between the text identifier and the image identifier is appropriate, offsets of texts in a first row and a third row in the x-direction are limited to one-quarter of the width of the text identifier (i.e., T1 and T6 are at positions offset to the left by one-quarter from the origin, and T3 and T8 are at positions offset to the right by one-quarter from the origin).

This process generates eight possible positions (T1 to T8) for the text.

[0194] In some embodiments, the occupied space in the bull's eye plot includes at least one of the following:

[0195] space occupied by any predetermined text in the bull's eye plot;

[0196] space occupied by any image identifier in the bull's eye plot; and

[0197] space occupied by any text identifier in the bull's eye plot.

[0198] In a possible implementation, whether there is an overlapping region can be detected by determining whether the space occupied by the text identifier and the occupied space overlap in the x-direction and y-direction, respectively. FIG. 10 illustrates four scenarios where the space occupied by the text identifier overlaps with the occupied space. Where, 'rect1' represents the space occupied by the text identifier, and 'rect2' represents the occupied space by the text identifier.

[0199] In this way, by configuring the collision condition, the text identifier corresponding to the data result is configured for the image identifier when the collision condition is satisfied, thereby reducing the overlapping between the text identifier and other content and improving the clarity of presenting the text identifier in the bull's eye plot.

[0200] As shown in FIG. 11, an embodiment of the present disclosure relates to a method for generating a bull's eye plot. The method includes:

[0201] Step 1101: configuring a connecting line identifier between a first image identifier in the image identifiers and a text identifier corresponding to the first image identifier in response to satisfying at least one of the following: a distance between the first image identifier and a second image identifier in the image identifiers is less than a first threshold; a distance between the first image identifier and the text identifier corresponding to the first image identifier is greater than a second threshold; and a distance between the first image identifier and the text identifier corresponding to the second image identifier is less than a third threshold.

[0202] In the bull's eye plot, if the image identifiers are close to each other, a user may not be able to determine the image identifier corresponding to the text identifier. Therefore, the connecting line identifier may be configured between the image identifier and the corresponding text identifier for the indication. Since the connecting line identifier may

affect the neatness of the bull's eye plot, a condition may be set and the connecting line identifier may be configured between the image identifier and the corresponding text identifier when the condition is satisfied. In this way, on one hand, the neatness and clarity requirements of the bull's eye plot can be satisfied, on the other hand, by configuring the connection line identifier, the misread of the image identifier and the corresponding text identifier is reduced and the recognition degree of the bull's eye plot is improved.

[0203] The connecting line identifier may include a visible connecting line, etc.

[0204] The method of this embodiment will be described combining with a specific example below.

[0205] FIG. 12 shows a bull's eye plot of a search result for a drug patent generated using the method of this embodiment.

[0206] As shown in FIG. 12, sectors of the bull's eye plot are divided based on a first classification (drug type). Concentric rings in the bull's eye plot are divided based on a second classification (drug development stage). The first classification includes: a small molecule drug, a biosimilar, an antibody, a tri-specific antibody, etc. The second classification includes: preclinical, phase 1 clinical, phase 2 clinical, etc. The first sector in the bull's eye plot lists the name of each second classification.

[0207] A span of each sector is determined based on a weighted value of the number (the first number) of drugs in each sub-concentric ring within the sector.

[0208] In the bull's eye plot of FIG. 12, dots are used as image identifiers to identify search results belonging to different sub-concentric rings. In the sub-concentric rings with the image identifiers, if the image identifiers exceed the capacity of the sub-concentric rings, a numerical value can be used to represent the number of the image identifiers.

[0209] In the bull's eye plot of FIG. 12, the image identifiers that can be identified by text identifiers are determined based on the collision condition and are identified by the text identifiers.

[0210] FIG. 13 illustrates an apparatus 10 for generating a bull's eye plot provided by an embodiment of the present disclosure. The apparatus includes:

[0211] a transceiver module 11, configured to acquire a plurality of data results; and

[0212] a processing module 12, configured to configure sectors of the bull's eye plot

based on at least one first classification of the plurality of data results,

[0213] the processing module is further configured to configure concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, where a span of each sector is determined based on a weighted value obtained by weighting a first number of the data results respectively included by all sub-concentric rings within the sector, and

[0214] the processing module is further configured to configure image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

[0215] In some embodiments, a weighted value of the first number is determined according to the second classification of a sub-concentric ring corresponding to the first number.

[0216] In some embodiments, the processing module is further configured to:

[0217] determine a second number of image identifiers configurable in each of the sub-concentric rings based on space occupied by each of the sub-concentric rings and space occupied by the image identifiers of the data results within the sector,

[0218] the processing module is specifically configured to perform at least one of the following:

[0219] in response to the second number corresponding to a first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring within the sector, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring; and

[0220] in response to the second number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring within the sector, identifying the first number corresponding to the first sub-concentric ring within the first sub-concentric ring.

[0221] In some embodiments, the processing module is further configured to:

[0222] determine a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring,

[0223] the processing module is specifically configured to perform at least one of the following:

[0224] in response to the third number corresponding to the first sub-concentric ring

being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring; and

[0225] in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, evenly configuring the image identifiers of the data results corresponding to the first sub-concentric ring within N circumferential rows of the first sub-concentric ring.

[0226] In some embodiments, the processing module is further configured to:

[0227] configure a text identifier corresponding to a data result for at least one image identifier.

[0228] In some embodiments, the processing module is specifically configured to:

[0229] sequentially configure the text identifier in at least one preset candidate position of the image identifier;

[0230] determine a first preset candidate position of the at least one preset candidate position satisfying a collision condition as a target position for placing the text identifier; and

[0231] place the text identifier at the target position.

[0232] The satisfying a collision condition includes at least one of the following: space occupied by the text identifier does not overlap with occupied space in the bull's eye plot; and an overlapping portion between the space occupied by the text identifier and the occupied space in the bull's eye plot is less than a predetermined value.

[0233] In some embodiments, the processing module is further configured to:

[0234] in response to all preset candidate positions of the image identifier not satisfying the collision condition, not configuring a corresponding text identifier for the image identifier.

[0235] In some embodiments, the occupied space in the bull's eye plot includes at least one of the following:

[0236] space occupied by any predetermined text in the bull's eye plot;

[0237] space occupied by any image identifier in the bull's eye plot; and

[0238] space occupied by any text identifier in the bull's eye plot.

[0239] In some embodiments, the processing module is further configured to:

[0240] configure a connecting line identifier between a first image identifier and a text identifier corresponding to the first image identifier in the image identifiers in response to satisfying at least one of the following:

[0241] a distance between the first image identifier and a second image identifier in the image identifiers is less than a first threshold;

[0242] a distance between the first image identifier and the text identifier corresponding to the first image identifier is greater than a second threshold; and

[0243] a distance between the first image identifier and a text identifier corresponding to the second image identifier is less than a third threshold.

[0244] It should be understood that the division of units or modules in the above apparatus is only a division of a logical function. In actual implementation, they may be fully or partially integrated into one physical entity or physically separated. In addition, the units or modules in the apparatus may be implemented in a form of a software invoked by a processor. For example, the apparatus includes a processor connected to a memory. The memory stores instructions, and the processor invokes the instructions stored in the memory to implement any of the above methods or the functions of the units or modules of the apparatus. The processor may be a general-purpose processor, such as a Central Processing Unit (CPU) or a microprocessor. The memory may be a memory inside the apparatus or a memory outside the apparatus. Alternatively, the units or modules in the apparatus may be implemented in a form of a hardware circuit. The functions of part or all of the units or modules may be implemented by designing the hardware circuit. The above-mentioned hardware circuit may be understood as one or more processors. For example, in one implementation, the above-mentioned hardware circuit is an application-specific integrated circuit (ASIC), and the functions of part or all of the units or modules are implemented by designing the logical relationship of elements in the circuit. For another example, in another implementation, the above-mentioned hardware circuit may be implemented by a programmable logic device (PLD). Taking a field programmable gate array (FPGA) as an example, it may include a large number of logic gate circuits, and a connection relationship between the logic gate circuits are configured through a configuration file to implement the functions of part or all of the units or modules. All units or modules in the above apparatus may be fully implemented by the software invoked by

the processor, fully implemented by a hardware circuit, or partially implemented by the software invoked by the processor and the remaining part is implemented by the hardware circuit.

[0245] In an embodiment of the present disclosure, the processor is a circuit with the signal processing capability. In one implementation, the processor may be a circuit capable of reading and running instructions, such as a central processing unit (CPU), a microprocessor, a graphics processing unit (GPU) (which may be understood as a type of the microprocessor), or a digital signal processor (DSP), etc. In another implementation, the processor may implement a certain function through a logical relationship of hardware circuits. The logical relationship of the above-mentioned hardware circuits is fixed or reconfigurable. For example, the processor may be a hardware circuit implemented by an application-specific integrated circuit (ASIC) or a programmable logic device (PLD), such as an FPGA. In a reconfigurable hardware circuit, the process loads a configuration file to implement process of configuring the hardware circuit, which may be understood as a process that the processor loads instructions to implement the functions of part or all of the above units or modules. In addition, the processor may also be a hardware circuit designed for artificial intelligence, which may be understood as a type of ASIC, such as a neural network processing unit (NPU), a tensor processing unit (TPU), a deep learning processing unit (DPU), etc.

[0246] FIG. 14 is a schematic structural diagram illustrating an electronic device 9100 provided by an embodiment of the present disclosure. The electronic device 9100 may be a computer terminal, a server, or a chip, a chip system, a processor, etc., that supports the implementation of any of the above methods, or a chip, a chip system, a processor, etc., that supports the implementation of any of the above information transmission methods by a terminal. The electronic device 9100 may be used to implement the method for generating the bull's eye plot described in the above-mentioned method embodiments. For details, refer to the description in the above-mentioned method embodiments.

[0247] As shown in FIG. 14, the electronic device 9100 includes one or more processors 9101. The processor 9101 may be a general-purpose processor or a special-purpose processor, etc. The processor 9101 is configured to invoke instructions to cause the electronic device 9100 to execute any of the above methods for generating a bull's eye plot.

[0248] In some embodiments, the electronic device 9100 further includes one or more memories 9102 for storing instructions. Optionally, all or part of the memories 9102 may also be located outside the electronic device 9100.

[0249] In some embodiments, the electronic device 9100 further includes one or more transceivers 9103. When the electronic device 9100 includes one or more transceivers 9103, steps such as transmitting, receiving, and/or acquiring in the above-mentioned methods are executed by the transceiver 9103, and other steps are executed by the processor 9101.

[0250] In some embodiments, steps such as acquiring etc., in the above-mentioned methods may also be executed by the processor 9101, for example, acquiring information from the memory 9102, etc.

[0251] Optionally, the electronic device 9100 further includes one or more interface circuits 9104. The interface circuit 9104 is connected to the memory 9102 and may be configured to receive a signal from the memory 9102 or other apparatus, and transmit a signal to the memory 9102 or other apparatus. For example, the interface circuit 9104 may read instructions stored in the memory 9102 and transmit the instructions to the processor 9101.

[0252] The electronic device 9100 described in the above embodiments may be a network device or a terminal, but the scope of the electronic device 9100 described in the present disclosure is not limited to this. A structure of the electronic device 9100 is not limited by FIG. 14. The electronic device may be an independent device or a part of a large device.

[0253] Those skilled in the art can understand that all or part of the steps in the above-mentioned method embodiments can be completed by a hardware related to program instructions. The aforementioned program can be stored in a storage medium. The storage medium includes: a mobile storage device, a Read-Only Memory (ROM), a Random Access Memory (RAM), a magnetic disk, or an optical disk, and other media that can store program codes.

[0254] Alternatively, if the integrated unit described above in the present disclosure is implemented in the form of a software functional module and sold or used as an independent product, it can also be stored in a computer-readable storage medium. Based on such understanding, the technical solutions of the embodiments of the present disclosure can be essentially embodied in the form of a software product, or a part that contributes to

the prior art can be embodied in the form of a software product. The computer software product is stored in a storage medium and includes several commands to enable a computer device (which may be a personal computer, a server, or a network device, etc.) to execute all or part of the methods described in each of the embodiments of the present disclosure. The aforementioned storage medium includes: a mobile storage device, a ROM, a RAM, a magnetic disk, or an optical disk, and other media that can store program codes.

[0255] It should be understood that the above embodiments are exemplary and are not intended to cover all possible implementations included in the claims. Without departing from the scope of the present disclosure, various modifications and changes can be made based on the above embodiments. Similarly, the technical features of the above embodiments can be arbitrarily combined to form additional embodiments of the present disclosure that may not have been explicitly described. Therefore, the above-mentioned embodiments only express several implementations of the present disclosure and do not limit the patent protection scope of the present disclosure.

CLAIMS

1. A method for generating a bull's eye plot, comprising:

acquiring a plurality of data results;

configuring sectors of the bull's eye plot based on at least one first classification of the plurality of data results;

configuring concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, wherein a span of each sector is determined based on a weighted value obtained by weighting a first number of the data results respectively comprised by all sub-concentric rings within the sector; and

configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

2. The method according to claim 1, wherein:

a weight of the first number is determined according to the second classification of a sub-concentric ring corresponding to the first number.

3. The method according to claim 1, wherein the method further comprises:

determining a second number of image identifiers configurable in each of the sub-concentric rings based on space occupied by each of the sub-concentric rings and space occupied by the image identifiers of the data results within the sector,

the step of configuring image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector comprises at least one of the following:

in response to the second number corresponding to a first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring within the sector, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring; and

in response to the second number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring within the sector, identifying the first number corresponding to the first sub-concentric ring within the first sub-concentric ring.

4. The method according to claim 3, wherein the method further comprises:
determining a third number of image identifiers configurable within a circumferential row of the first sub-concentric ring,

the step of configuring the image identifiers of the data results corresponding to the first sub-concentric ring within the first sub-concentric ring comprises:

in response to the third number corresponding to the first sub-concentric ring being greater than or equal to the first number corresponding to the first sub-concentric ring, configuring the image identifiers of the data results corresponding to the first sub-concentric ring within one circumferential row of the first sub-concentric ring; and

in response to the third number corresponding to the first sub-concentric ring being less than the first number corresponding to the first sub-concentric ring, evenly configuring the image identifiers of the data results corresponding to the first sub-concentric ring within N circumferential rows of the first sub-concentric ring.

5. The method according to claim 1, wherein the method further comprises:
configuring a text identifier corresponding to a data result for at least one image identifier.

6. The method according to claim 5, wherein the step of configuring a text identifier corresponding to a data result for at least one image identifier comprises:

sequentially configuring the text identifier in at least one preset candidate position of the image identifier;

determining a first preset candidate position of the at least one preset candidate position satisfying a collision condition as a target position for placing the text identifier;
and

placing the text identifier at the target position,

the satisfying a collision condition comprises at least one of the following:

space occupied by the text identifier does not overlap with occupied space in the bull's eye plot; and

an overlapping portion between the space occupied by the text identifier and the occupied space in the bull's eye plot is less than a predetermined value.

7. The method according to claim 6, wherein the method further comprises:
in response to all preset candidate positions of the image identifier not satisfying the collision condition, not configuring a corresponding text identifier for the image identifier.

8. The method according to claim 6, wherein the occupied space in the bull's eye plot comprises at least one of the following:

- space occupied by any predetermined text in the bull's eye plot;
- space occupied by any image identifier in the bull's eye plot; and
- space occupied by any text identifier in the bull's eye plot.

9. The method according to any one of claims 6 to 8, wherein the method further comprises:

- configuring a connecting line identifier between a first image identifier and a text identifier corresponding to the first image identifier in the image identifiers in response to satisfying at least one of the following:

- a distance between the first image identifier and a second image identifier in the image identifiers is less than a first threshold;

- a distance between the first image identifier and the text identifier corresponding to the first image identifier is greater than a second threshold; and

- a distance between the first image identifier and a text identifier corresponding to the second image identifier is less than a third threshold.

10. An apparatus for generating a bull's eye plot, comprising:

- a transceiver module, configured to acquire a plurality of data results; and

- a processing module, configured to:

- configure sectors of the bull's eye plot based on at least one first classification of the plurality of data results;

- configure concentric rings of the bull's eye plot based on at least one second classification of the plurality of data results, wherein a span of each sector is determined based on a weighted value obtained by weighting a first number of data results respectively

comprised by all sub-concentric rings within the sector; and
configure image identifiers respectively corresponding to the data results within the sub-concentric rings of the sector.

11. An electronic device, comprising:

one or more processors;

wherein the processor is configured to invoke instructions to cause the electronic device to execute the method for generating a bull's eye plot according to any one of claims 1 to 9.

12. A storage medium, wherein the storage medium stores instructions that, when run on an electronic device, cause the electronic device to execute the method for generating a bull's eye plot according to any one of claims 1 to 9.