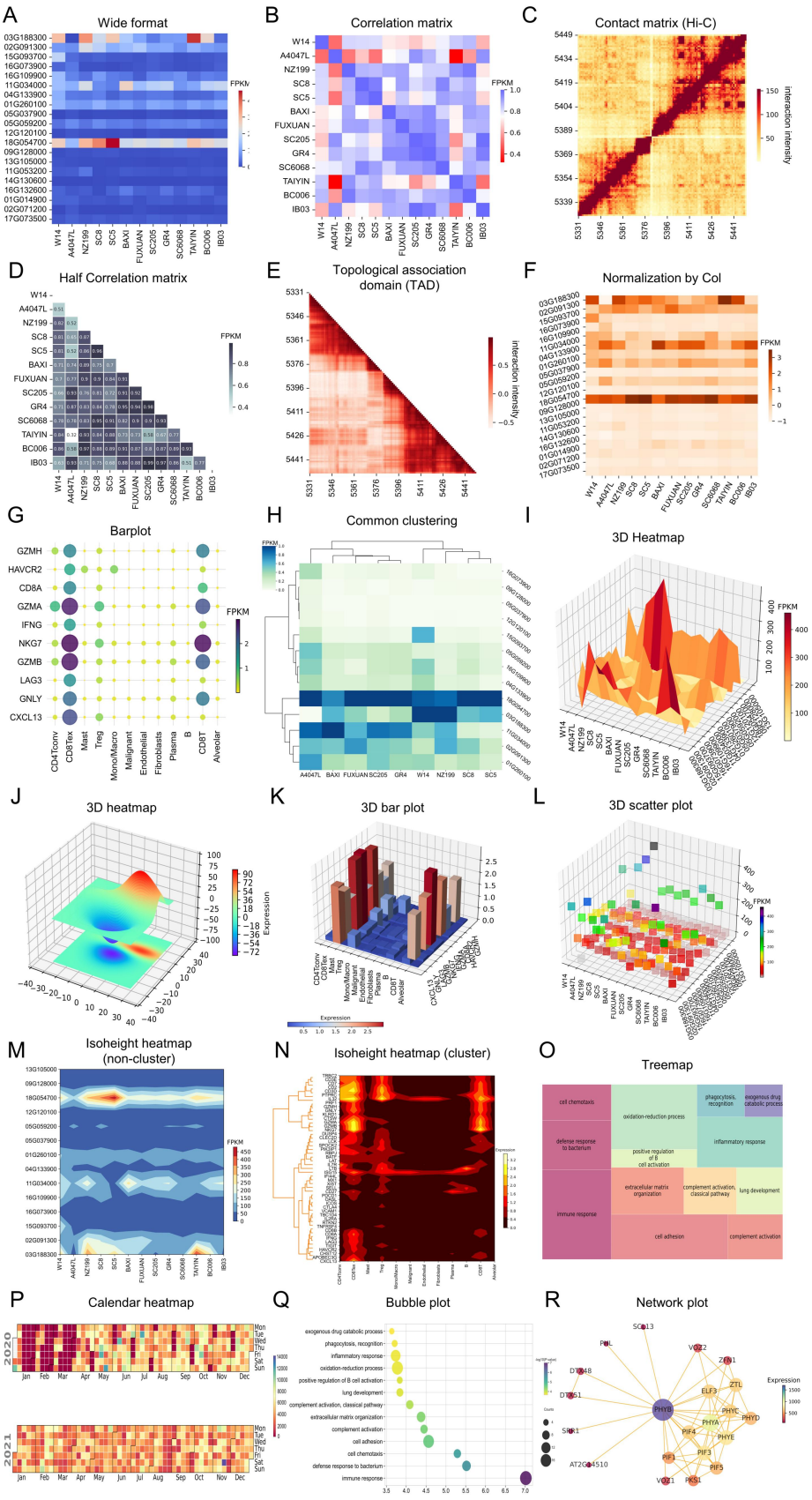
DataColor v1.0 user manual

Sample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Overview

With the rapid advancement of high-throughput histology technologies and the accompanying rapid increase in big biological data, the need for multidimensional and big data visualisation is growing. Technological high speed innovation researchers have developed Various bioinformatics software programs, pipelines, and packages to plot heat maps, but also require users to have a basic knowledge of various programming languages. Increasingly, users need comprehensive, fast, easy, and intuitive retrieval of the information contained in big data. Easier visualisation of large histological data to solve biological problems is extremely important. To this end, we have designed the heatmap visualisation software DataColor. DataColor is designed to allow users to easily and quickly select parameters and debug and to intuitively select the appropriate heatmap. It also integrates a large number of general-purpose heatmaps and develops innovative heatmaps in-house, such as 3D heatmaps, 3D clustered heatmaps and isometric heatmaps. DataColor involves both 2D and 3D drawing methods and has three types of functions for drawing heatmaps, such as basic class heatmaps, clustered heatmaps and higher heatmaps.

Download and install DataColor

Download links

https://github.com/frankgenome/heatmap

Core programs

Introduction to the input and output files

The input file is a csv file, which stores tabular data (numbers and text) in plain text, and is recommended to be opened using wordpad or Notepad, or by saving a new file and opening it in EXCEL. format files.

The output files are images, scalar images such as png and jpg, and svg vector images, and can also be produced as in pdf format.

1.Wide format

Wide format is a convenient heat map where the colour of the cells varies according to their values. This method has no clustering and can be chosen if the collation of data is not required.

Select

Menu-> Background unspecified -> 2D heatmap -> Wide format

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295.66113	0.768899	351.70053	204.8578
3	02G091300	83.022034	72.937263	222.14972	177.2988
4	15G093700	182.44138	32.841427	17.856619	24.71782
5	16G073900	27.497925	48.170895	6.786274	7.13618
6	16G109900	135.57636	60.577694	38.953354	89.21078
7	11G034000	137.12767	116.1588	218.75143	68.27366
8	04G133900	113.67653	49.453854	45.006413	56.43525
9	01G260100	124.43154	90.558517	87.675385	119.0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

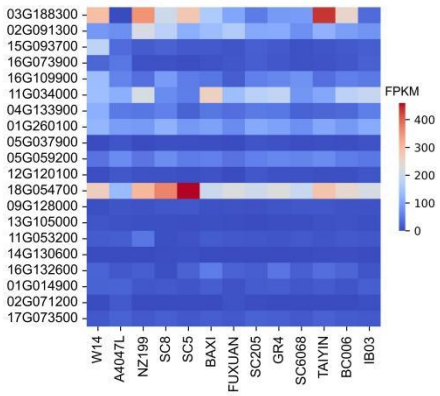

Fig: Wide Format output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, if you need to adjust the parameters please see the following introduction.
    1) Set the X-axis and Y-axis on/off, font, font size, colour, rotation angle and step size.
    2) Scale-min and Scale-max can be used to customise the range of values for the colour bar, or you can select None and have the system define them automatically.
    3) show data displays the data values of each square on the heat map and allows you to adjust the font size of the data values.
    4) Scale lable is divided into out, into and in, which adjusts the orientation of the label teeth on the X and Y axes.
    5) Cell square is to turn each of the small squares generated by the heat map into a square.
    6) Color bar sets its orientation, label font size, label name, size and colour.
    7) The colour map contains 166 types and is divided into the following four main categories: Sequential colormaps: continuous colormaps, Diverging colormaps: colormaps that diverge at both ends, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.
    8) Line widths are the dividing lines of the heat map, if you need to be able to adjust the colours, just select a value greater than 0 for the width.
3. Once all configurations are complete, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

2.Correlation matrix

Correlation matrix is used to find the pairwise correlation of all columns in a data frame and to discover which variable is correlated with another variable by visualisation.

Select

Menu-> Background unspecified -> 2D heatmap -> Correlation matrix

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295. 66113	0. 768899	351. 70053	204. 8578
3	02G091300	83. 022034	72. 937263	222. 14972	177. 2988
4	15G093700	182. 44138	32. 841427	17. 856619	24. 71782
5	16G073900	27. 497925	48. 170895	6. 786274	7. 13618
6	16G109900	135. 57636	60. 577694	38. 953354	89. 21078
7	11G034000	137. 12767	116. 1588	218. 75143	68. 27366
8	04G133900	113. 67653	49. 453854	45. 006413	56. 43525
9	01G260100	124. 43154	90. 558517	87. 675385	119. 0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

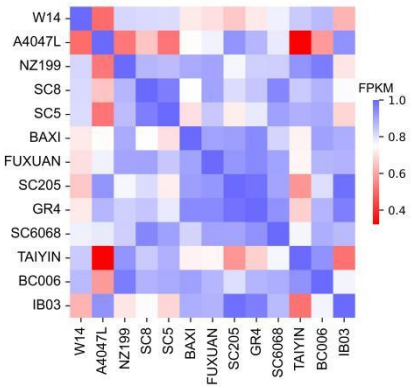

Fig: Correlation matrix output image

Detailed instructions for use

1. First click on the file button on the right and select the comma-separated value (CSV) format file you need to visualize.
2. Default parameters have been set, if you need to adjust the parameters please see Wide Format parameters.
3. Once all configurations are complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

3.Contact matrix (Hi-C)

High-throughput chromosome conformation capture is an experimental technique for studying genome-wide three-dimensional conformations and analysing chromatin fragment interactions.Hi-C aims to understand the three-dimensional conformation of chromatin in the nucleus, to obtain chromatin fragments in close spatial proximity or with interactions in the nucleus and to better study chromatin interactions within or between chromatin. interactions and genome-wide regulation of gene regulatory elements.If you are hic format files, before using this function you need to use HiCexplorer software hicConvertFormat to convert hic/ hicpro matrix files to ginteractions format, and then to txt or csv three column format files.

Select

Menu-> Background unspecified -> 2D heatmap -> Contact matrix (Hi-C)

Input

Csv format target sequence file

index1	index2	freq
5331	5331	154
5331	5332	154
5331	5333	129
5331	5334	87
5331	5335	58
5331	5336	69
5331	5337	65
5331	5338	48

Fig: txt formatted file.

Output

Generate image in the left canvas

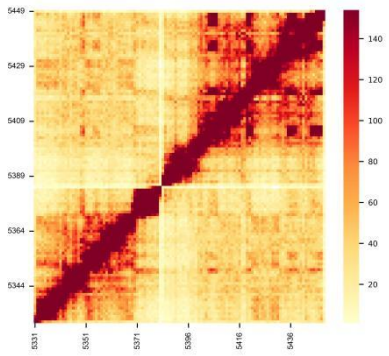

Fig: Correlation matrix(Hi-C) output image

Detailed instructions for use

1. First click on the file button on the right and select the comma-separated value (CSV) format file you need to visualize.
2. Default parameters have been set, if you need to adjust the parameters please see Wide Format parameters.
3. Once all configurations are complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heatmap. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

4.Half correlation matrix

Correlation matrix is used to find the pairwise correlation of all columns in a data frame and to discover which variable is correlated with another variable by visualisation.

Select

Menu-> Background unspecified -> 2D heatmap -> Half correlation matrix

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295. 66113	0. 768899	351. 70053	204. 8578
3	02G091300	83. 022034	72. 937263	222. 14972	177. 2988
4	15G093700	182. 44138	32. 841427	17. 856619	24. 71782
5	16G073900	27. 497925	48. 170895	6. 786274	7. 13618
6	16G109900	135. 57636	60. 577694	38. 953354	89. 21078
7	11G034000	137. 12767	116. 1588	218. 75143	68. 27366
8	04G133900	113. 67653	49. 453854	45. 006413	56. 43525
9	01G260100	124. 43154	90. 558517	87. 675385	119. 0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

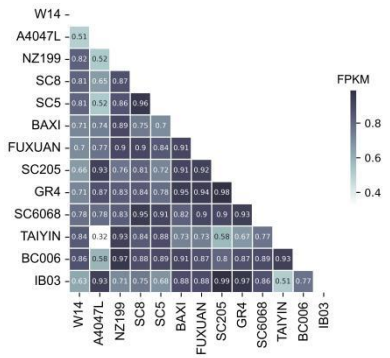

Fig: Half correlation matrix output image

Detailed instructions for use

1. First click on the file button on the right and select the comma-separated value (CSV) format file you need to visualize.
2. Default parameters have been set, if you need to adjust the parameters please see Wide Format parameters.
3. Once all configurations are complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

5.Topologically assocaited domain

Genome interoperation mapping is essentially a symmetric matrix with equal information on both sides of the diagonal. The intensity of the interactions ranges from weak to strong, with the colour of the cells transitioning from white to red. There are small triangular regions repeated out of the bottom edge, almost all of which are red inside, indicating a high frequency of interactions between chromatin segments within these regions, such regions are called self-interaction regions, while the frequency of interactions between adjacent triangular regions is low, with red triangular regions corresponding to interactions between regions within TADs, and black regions corresponding to inter-TAD The red triangular areas correspond to the interactions within the TAD, while the black areas correspond to the interactions between TADs. The red triangular region corresponds to the interactions of the intra-TAD region, while the black region corresponds to the interactions between TADs. The triangular interactions are presented on the triangular interactions map, which corresponds to a number of small red triangles on the bottom edge, while the triangles correspond to interactions that are all white. format file, you will need to use HiCexplorer's hicConvertFormat to convert the .hic/ hicpro matrix file to ginteractions format, and then to a three-column file in txt or csv before using this function.

Select

Menu-> Background unspecified -> 2D heatmap -> Topologically Assocaited Domain

Input

Csv format target sequence file

index1	index2	freq
5331	5331	154
5331	5332	154
5331	5333	129
5331	5334	87
5331	5335	58
5331	5336	69
5331	5337	65
5331	5338	48

Fig: CSV formatted file.

Output

Generate image in the left canvas

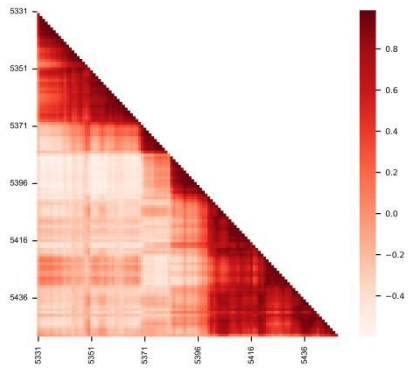

Fig: Topologically assocaited domain output image

Detailed instructions for use

1. First click on the file button on the right and select the comma-separated value (CSV) format file you need to visualize.
2. Default parameters have been set, if you need to adjust the parameters please see Wide Format parameters.
3. Once all configurations are complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

6. Barplot

Datacolor has added the Barplot function, which can use 23 different shapes such as point, diamond, circle, and star to draw heat maps, increasing the richness of heat map graphics. In addition to the color representing the data, the size of the point and the depth of the color are consistent. At the same time Represents the magnitude of the value. And it can realize point synchronous enlargement and synchronous reduction.

Select

Menu->Background unspecified -> 2D heatmap -> Barplot

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

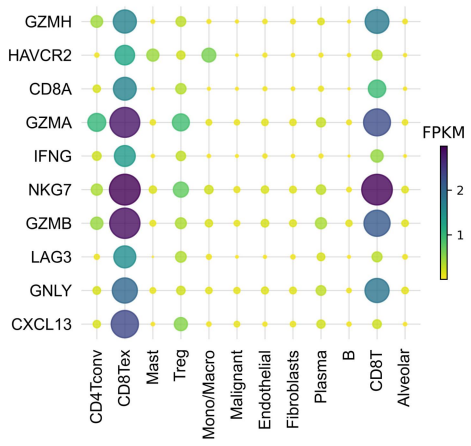

Fig: Barplot output image

Detailed instructions for use

1. First click the file button on the right and select the comma-separated value (CSV) format file to be visualized
2. The default parameters have been set, if you need to adjust the parameters, please see below

Detailed usage method:

1) Set the X-axis and Y-axis on and off, font, font size, color, rotation angle and step size
2) Color bar sets its direction, label font size, label name, size, color, position, and font size.
3) The color map contains 166 types, which are mainly divided into the following four categories: Sequential colormaps: continuous color map, Diverging colormaps: color map diverging at both ends, Qualitative colormaps: discretized color map, Miscellaneous colormaps: other color maps. Such as 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc., each suffix _r color map is the original color bar flipped horizontally.
4) Dot shape sets 23 dot shapes
5) Dot size magnification can adjust the size of the point
6) The Transparency parameter can adjust the transparency of the point color

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

7.Normalization（Column/ Row）

The design of the normalised class heat map parameters is consistent with the base class heat map, unlike the mean normalisation equation we set up in the programming of the normalised class heat map. Normalisation is a fundamental task in data mining. Different evaluation indicators often have different magnitudes and magnitude units, such a situation will affect the results of data analysis, in order to eliminate the influence of magnitudes between indicators, data normalisation is needed to address the comparability between data indicators. After the raw data has been standardised, the indicators are at the same order of magnitude and are suitable for comprehensive comparative evaluation. The mean normalisation equation gives the mean and standard deviation of the raw data to standardise the data. Column is selected for row normalisation; Row is selected for column normalisation.

Select

Menu-> Background unspecified -> 2D heatmap -> Normalization by Col\\Normalization by Row

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295.66113	0.768899	351.70053	204.8578
3	02G091300	83.022034	72.937263	222.14972	177.2988
4	15G093700	182.44138	32.841427	17.856619	24.71782
5	16G073900	27.497925	48.170895	6.786274	7.13618
6	16G109900	135.57636	60.577694	38.953354	89.21078
7	11G034000	137.12767	116.1588	218.75143	68.27366
8	04G133900	113.67653	49.453854	45.006413	56.43525
9	01G260100	124.43154	90.558517	87.675385	119.0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

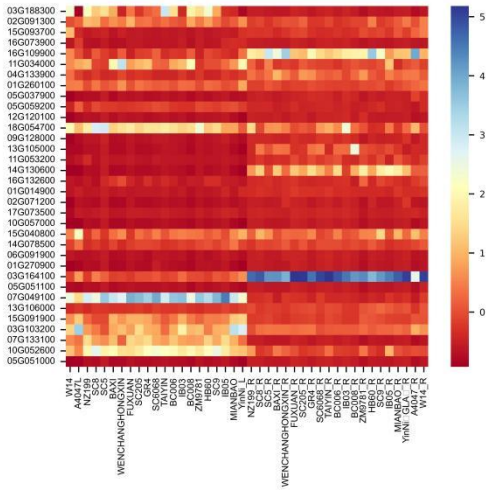

Fig: Normalization by Col\Normalization by Row output image

Detailed instructions for use

1. First click on the file button on the right and select the comma-separated value (CSV) format file you need to visualize.
2. Default parameters have been set, if you need to adjust the parameters please see Wide Format parameters.
3. Once all configurations are complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

8.Common clustering

Common clustering is a heat map with tree-like clustering for users who want to cluster their data. This type of graph can be simply understood as a cluster of data values that are close to each other using a distance algorithm on top of the original base heatmap. Seven clustering methods and 22 distance measures are provided.

Select

Menu-> Background unspecified -> 2D heatmap -> Common clustering

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295. 66113	0. 768899	351. 70053	204. 8578
3	02G091300	83. 022034	72. 937263	222. 14972	177. 2988
4	15G093700	182. 44138	32. 841427	17. 856619	24. 71782
5	16G073900	27. 497925	48. 170895	6. 786274	7. 13618
6	16G109900	135. 57636	60. 577694	38. 953354	89. 21078
7	11G034000	137. 12767	116. 1588	218. 75143	68. 27366
8	04G133900	113. 67653	49. 453854	45. 006413	56. 43525
9	01G260100	124. 43154	90. 558517	87. 675385	119. 0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

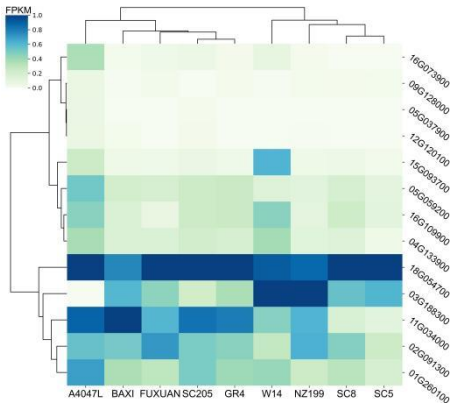

Fig: Common clustering output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, if you need to adjust the parameters please see the following introduction.
    1) X-axis and Y-axis set the X-axis and Y-axis on/off, font, font size, colour, rotation angle and step length.

2) Row cluster and Col cluster control the clustering of rows and columns on and off.
3) Scale-min and Scale-max allow you to define the range of values for the Color bar, or you can choose None, which is automatically defined by the system.
4) show data allows you to display the data values of each square on the heat map, and to adjust the font size of the data values.
5) Metric allows you to choose from 7 clustering methods.
6) Method allows you to choose from 22 distance measures.
7) Cell square converts each of the resulting small squares of the heat map into a square.
8) Color bar sets its orientation, label font size, label name, size and colour.
9) The colour map contains 166 types and is divided into the following four main categories: Sequential colormaps: continuous colormaps, Diverging colormaps: colormaps with dispersion at both ends, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.
10) Line widths are the dividing lines of the heat map, if you need to adjust the colour, select a value greater than 0 for the width.
11) Column comment enables column commenting, comment column name enters the name of the column to comment on, which is also the name of the comment column in the diagram.
12) Classify color1, Classify color2, Classify color3 select what colour.
13) Tree style sets the shape, width and colour of the clustering tree.
14) Robust opens the possibility to use quantile to calculate the colour mapping range.

3. Once all configurations are complete, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

9.Standard clustering

Standard clustering is a normalised approach to clustering heatmaps. The dimension is normalised for rows or columns, i.e. each row or column is subtracted from the minimum value of the data and divided by the maximum value of the data.

Select

Menu-> Background unspecified -> 2D heatmap -> Standard clustering

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295.66113	0.768899	351.70053	204.8578
3	02G091300	83.022034	72.937263	222.14972	177.2988
4	15G093700	182.44138	32.841427	17.856619	24.71782
5	16G073900	27.497925	48.170895	6.786274	7.13618
6	16G109900	135.57636	60.577694	38.953354	89.21078
7	11G034000	137.12767	116.1588	218.75143	68.27366
8	04G133900	113.67653	49.453854	45.006413	56.43525
9	01G260100	124.43154	90.558517	87.675385	119.0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

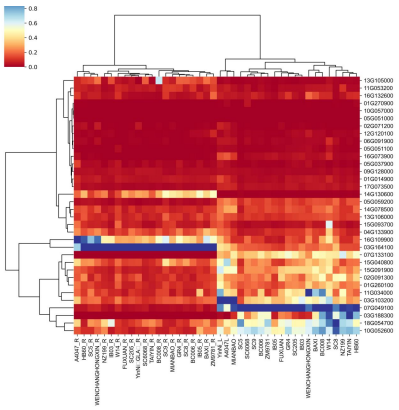

Fig: Standard clustering output image

Detailed instructions for use

1. First click on the file button on the right hand side and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, if you need to adjust parameters please see Cluster parameters.
3. Once all the configuration is complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

10.Z-score clustering

The Z-score is a normalisation of the clustering heat map. the Z-score equation gives the mean and standard deviation of the original data to normalise the data.

Select

Menu-> Background unspecified -> 2D heatmap -> Z-score clustering

Input

Csv format target sequence file

	A	B	C	D	E
1		W14	A4047L	NZ199	SC8
2	03G188300	295. 66113	0. 768899	351. 70053	204. 8578
3	02G091300	83. 022034	72. 937263	222. 14972	177. 2988
4	15G093700	182. 44138	32. 841427	17. 856619	24. 71782
5	16G073900	27. 497925	48. 170895	6. 786274	7. 13618
6	16G109900	135. 57636	60. 577694	38. 953354	89. 21078
7	11G034000	137. 12767	116. 1588	218. 75143	68. 27366
8	04G133900	113. 67653	49. 453854	45. 006413	56. 43525
9	01G260100	124. 43154	90. 558517	87. 675385	119. 0357

Fig: CSV formatted file.

Output

Generate image in the left canvas

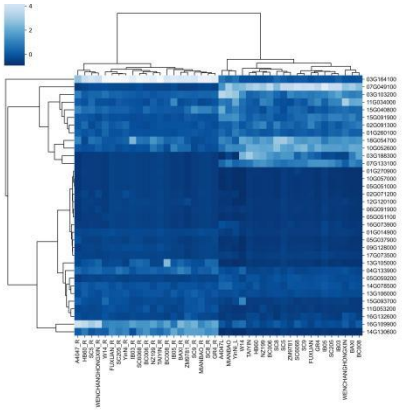

Fig: Z-score clustering output image

Detailed instructions for use

1. First click on the file button on the right hand side and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, if you need to adjust parameters please see Cluster parameters.
3. Once all the configuration is complete, click on the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

11.3D non-cluster

The 3D Heatmap displays three dimensions of data at the same time, making the results of complex data analysis much clearer and easier to obtain directly from the graph.

Select

Menu-> Background unspecified -> 3D heatmap -> 3D non-cluster

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

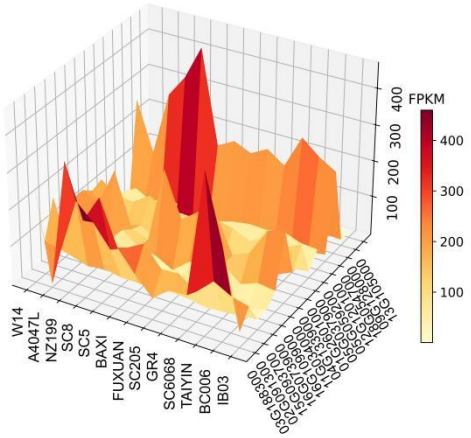

Fig: 3D non-cluster output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. The default parameters have been set, if you want to adjust the parameters please see the following introduction.
    1) X-axis, Y-axis, Z-axis set the X-axis, Y-axis, Z-axis on and off, font, font size, colour, rotation angle
    2) Color bar sets the direction, label size, label name, size and colour.
    3) The colour map contains 166 types, mainly divided into the following four categories: Sequential colormaps: continuous colormaps,

Diverging colormaps: discrete colormaps at both ends, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.

4) Number of colour bar scales set the number of scales
5) Cbar lable and Cbar lable size can set the label and label size of the Color bar.
6) Title, X-lable, Y-lable, Z-lable can set the label.

3. Once all configurations are completed, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

12.3D cluster by Row

The 3D cluster by Row performs column clustering on top of the 3D Heatmap. Seven clustering methods and 22 distance metrics are provided.

Select

Menu-> Background unspecified -> 3D heatmap -> Cluster by Row

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

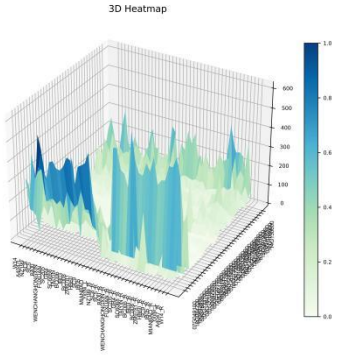

Fig: 3D Heatmap(Cluster by Row) output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. The default parameters have been set, if you want to adjust the parameters please see the following introduction.

1) X-axis, Y-axis, Z-axis set the X-axis, Y-axis, Z-axis on and off, font, font size, colour, rotation angle.
2) Metric can choose 7 types of clustering methods.
3) Method allows you to choose 22 distance metrics.
4) Color bar sets its direction, label font, label name, size and colour.
5) The colour map contains 166 types, mainly divided into the following four categories: Sequential colormaps: continuous colour maps,

Diverging colormaps: colour maps with dispersion at both ends, Qualitative colormaps: discrete colour maps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.

6) Number of colour bar scales set the number of scales
7) Cbar lable and Cbar lable size can set the label and label size of the Color bar
8) Title, X-lable, Y-lable, Z-lable can set the label

3. Once all configurations are completed, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

13.3D Heatmap(Cluster by Col)

The 3D Heatmap (Cluster by Col) performs row clustering on top of the 3D Heatmap. Seven clustering methods and 22 distance metrics are provided.

Select

Menu-> Background unspecified -> 3D heatmap -> Cluster by Col

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

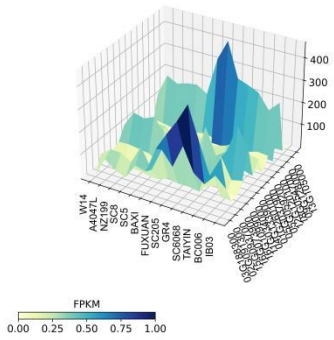

Fig: 3D Heatmap(Cluster by Col) output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, to adjust parameters see 3D Heatmap (Cluster by Col) parameters.
3. Once all configurations are completed, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

14.3D scatter plot

The 3D Scatter Heatmap is very similar to the 3D heatmap in that all data is represented by a square scatter in 3D coordinates and the colour is represented by the corresponding data in 2D. The most characteristic feature is that the 3D heatmap when viewed from an overhead perspective is extremely similar to the 2D heatmap presentation, ensuring the accuracy of the heatmap. The third data can be represented both by colour differences and by the height in 3D space.

Select

Menu-> Background unspecified -> 3D heatmap -> 3D scatter plot

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

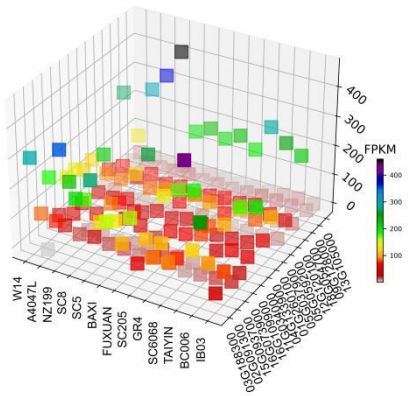

Fig: 3D scatter plot output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated

value (CSV) format file you need to visualise.
2. Default parameters have been set, to adjust parameters please see 3D Heatmap parameters.
3. Once all configurations are completed, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

15.3D Bar plot

The 3D Bar Heatmap, much like the 3D Scatter Heatmap, represents all data as columns in 3D coordinates, with the colours being represented by their 2D counterparts, the data being represented both by colour differences and by the height of the columns.

Select

Menu-> Background unspecified -> 3D heatmap -> 3D Bar plot

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

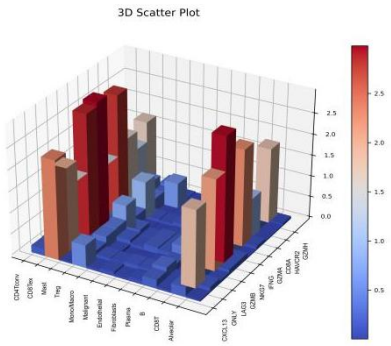

Fig: 3D Bar plot output image

Detailed instructions for use

1. First click on the file button on the right and select the comma separated value (CSV) format file you need to visualise.
2. Default parameters have been set, to adjust parameters please see 3D Heatmap parameters.
3. Once all configurations are completed, click the "Run" button to display or update the heat map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four

image formats: png, .jpg, pdf, and .svg, to meet different needs.

16.Isoheight heatmap (non-cluster)

Isoheight heatmap (non-cluster) is a heatmap model that we have created by combining contour maps with tree clustering. Isoheight heatmaps use a two-dimensional format to represent three-dimensional data. This type of heatmap is better suited to large amounts of biological data, and the differences in colour allow us to see the differences between data at a macro level.

Select

Menu-> Background unspecified -> Isoheight heatmap -> Isoheight heatmap (non-cluster)

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

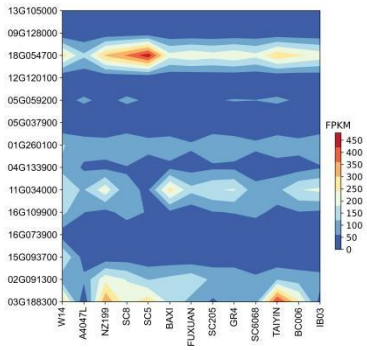

Fig: Isoheight heatmap (non-cluster) output image

Detailed instructions for use

1. First click the file button on the right and select the comma-separated value (CSV) format file to be visualized
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below

1) X-axis and Y-axis set the X-axis and Y-axis on and off, font, font size, color, rotation angle and step size.
2) Row cluster and Col cluster control the opening and closing of the clustering dendrogram of rows and columns.
3) Scale-min and Scale-max can customize the total value range of the Color bar, and Scale interval sets the value range of each color block on the Color bar, and can change the fineness of the color to adjust the drawing effect.
4) Show data can display the data value of each grid on the heat map, and can also adjust the display font size of the data value.
5) Color bar sets its direction, label font size, label name, size and color.
6) There are 166 color maps, which are mainly divided into the following four categories: Sequential colormaps: continuous color maps, Diverging colormaps: color maps that diverge at both ends, Qualitative colormaps: discrete color maps, Miscellaneous colormaps: other color maps. Such as 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc., each suffix _r color map is the original color bar flipped horizontally.
7) Number of color bar scales Set the number of scales.
8) Cbar lable and Cbar lable size can set the label and label font size of Color bar.

3. After completing all configurations, click the "Run" button to display or update the heatmap, and the heatmap will appear in the left canvas.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

17.Isoheight heatmap (cluster)

Isoheight heatmap is a heat map mode that we combine contour map and dendritic clustering. The contour heat map uses two-dimensional form to reflect three-dimensional data. This type of heat map is more suitable for a large amount of biological data, and the high expression value is surrounded by clustering. Through the color difference, we can see the difference between the data macroscopically . The clustering effect is reflected by a variety of tree colors, which is also one of the highlights of the contour heat map.

Select

Menu-> Background unspecified -> Isoheight heatmap -> Isoheight heatmap (non-cluster)

Input

Csv format target sequence file

	A	B	C	D	E
1	ID	CD4Tconv	CD8Tex	Mast	Treg
2	CXCL13	0.16739	2.34559	0.03696	0.54081
3	GNLY	0.17927	1.98292	0.09965	0.221
4	LAG3	0.07972	1.51753	0.00396	0.35516
5	GZMB	0.46595	2.88772	0.10262	0.37069
6	NKG7	0.38711	2.98404	0.1641	0.71816
7	IFNG	0.23486	1.37227	0.03247	0.27498
8	GZMA	1.00936	2.82031	0.08614	0.91043
9	CD8A	0.16879	1.63692	0.02098	0.33116

Fig: CSV formatted file.

Output

Generate image in the left canvas

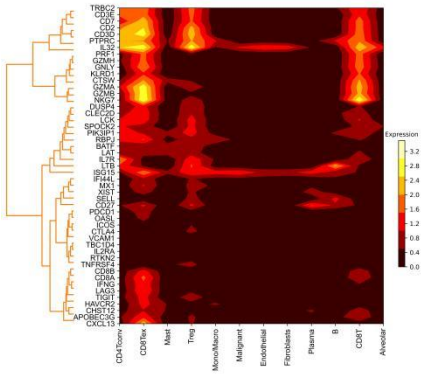

Fig: Isoheight heatmap (cluster) output image

Detailed instructions for use

1. First click the file button on the right and select the comma-separated value (CSV) format file to be visualized

2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below

1) X-axis and Y-axis set the X-axis and Y-axis on and off, font, font size, color, rotation angle and step size.
2) Row cluster and Col cluster control the opening and closing of the clustering dendrogram of rows and columns.
3) Scale-min and Scale-max can customize the total value range of the Color bar, and Scale interval sets the value range of each color block on the Color bar, and can change the fineness of the color to adjust the drawing effect.
4) Show data can display the data value of each grid on the heat map, and can also adjust the display font size of the data value.
5) Metric can choose 7 clustering methods.
6) Method can choose 22 distance measures.
7) Color bar sets its direction, label font size, label name, size and color.
8) There are 166 color maps, which are mainly divided into the following four categories: Sequential colormaps: continuous color maps, Diverging colormaps: color maps that diverge at both ends, Qualitative colormaps: discrete color maps, Miscellaneous colormaps: other color maps. Such as 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc., each suffix _r color map is the original color bar flipped horizontally.
9) Number of color bar scales Set the number of scales.
10) Cbar lable and Cbar lable size can set the label and label font size of Color bar.

3. After completing all configurations, click the "Run" button to display or update the heatmap, and the heatmap will appear in the left canvas.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

18.Treemap

Treemap diagrams, also known as rectangular tree mapping, rectangular tree mapping and rectangular tree mapping, refer to a method of displaying tree data using nested rectangles. This method of presentation allows different categories to be presented in different coloured blocks and allows the size of the blocks to be compared to the size of each category. The larger the range of the blocks, the larger and more numerous the category.

Select

Menu-> Background unspecified -> Treemap -> Treemap

Input

Excel target format file

Description	PValue
dendritic cell chemotaxis	0.0133971
receptor-mediated endocytosis	0.013738177
proteolysis	0.016467098
negative regulation of growth	0.01661592
positive regulation of fibroblast	0.018995878
negative regulation of protein kir	0.02032845
positive regulation of cardiac mus	0.021990955
platelet degranulation	0.023126906
response to mechanical stimulus	0.023974023

Fig: Excel file.

Output

Generate image in the left canvas

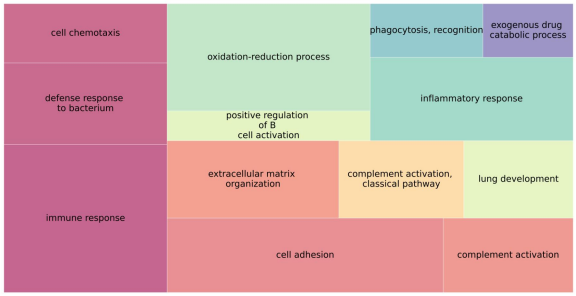

Fig: Treemap output image

Detailed instructions for use

1. First click the file button on the right and select the comma-separated value (CSV) format file to be visualized
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below
    1) Show lable displays the data values of each square on the Treemap and allows you to adjust the display size of the lable.
    2) The colour map contains 166 types and is divided into four main categories: Sequential colormaps: continuous colormaps, Diverging

colormaps: discrete colormaps at both ends, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.

3) Border widths are the dividing lines for each cell of the Treemap, if you need to adjust the colour, select a value greater than 0 for the width.
4) Transparency sets the transparency of the colour bar, ranging from 0 to 1.
5) Title sets the label and font size.

3. After completing all configurations, click the 'Run' button to display or update the Treemap, which will appear in the canvas on the left.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

19.Calendar heatmap

The Calendar Heatmap is an intuitive way to visualise data when doing feature analysis of time-series data.

Select

Menu-> Background unspecified -> Calendar heatmap -> Calendar heatmap

Input

Excel target format file

Date	Counts
2/24/2003	2871
5/7/2003	2765.9
7/1/2003	3884.34
8/25/2003	3746.7
10/10/2003	5205.27
10/28/2003	3479.76

Fig: Excel file.

Output

Generate image in the left canvas

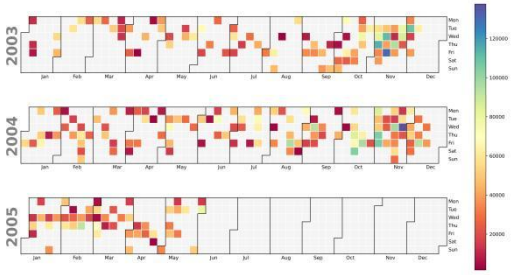

Fig: Calendar heatmap output image

Detailed instructions for use

1. First click the file button on the right and select the comma-separated value (CSV) format file to be visualized.
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below.
    1) Show data displays the data values of each square on the heat map
    2) The colour map contains 166 types and is divided into four main categories: Sequential colormaps: continuous colormaps, Diverging colormaps: discrete colormaps at both ends, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps: Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.
    3) Border widths are the dividing lines for each month of the Calendar heatmap, if you need to adjust the colour, just select a value greater than 0 for the width.
    4) 'Year lable colour' sets the colour of the month label.

5) Title can set the label.

3. After completing all configurations, click the 'Run' button to display or update the Treemap, which will appear in the canvas on the left.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

20. Bubble plot

The bubble plot is a multivariate chart and a variation of a scatterplot. A bubble chart is a combination of a scatter chart and a percentage area chart. Bubble plot can analyze the correlation between data through the position, area and color size of the bubbles. It is suitable for data with a small amount of data and a clear location relationship. GO and KEGG enrichment data are commonly used scenarios of Bubble plot. The color of the bubble is used to represent the p-value (or q-value, etc.), and the size represents the number of genes.

Select

Menu-> Background unspecified -> Bubble plot -> Bubble plot

Input

Excel target format file

	A	B	C
1	Description	PValue	Count
2	immune response	9.61E-08	20
3	defense response to bacterium	3.02E-06	11
4	cell chemotaxis	5.14E-06	8
5	cell adhesion	2.73E-05	17
6	complement activation	3.56E-05	8

Fig: Excel file.

Output

Generate image in the left canvas

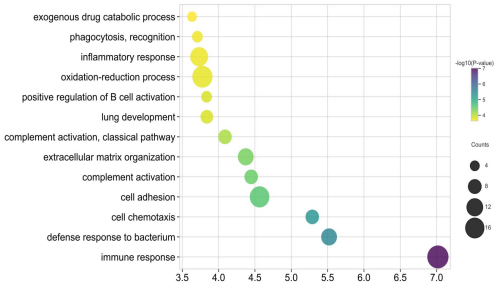

Fig: Bubble plot output image

Detailed instructions for use

1. First click the file button on the right and select the Excel file to be visualized
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below

1) Set the X-axis and Y-axis on and off, font, font size, color, rotation angle and step size

2) Color bar sets its direction, label font size, label name, size, color, position, and font size.
3) Cbar lable2 is used as the label of the size bar, and the Cbar lable2 size parameter is added at the same time. The 'Distance between entries in the legend' parameter can set the label distance inside the size bar
4) The color map contains 166 types, which are mainly divided into the following four categories: Sequential colormaps: continuous color map, Diverging colormaps: color map diverging at both ends, Qualitative colormaps: discretized color map, Miscellaneous colormaps: other color maps. Such as 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc., each suffix _r color map is the original color bar flipped horizontally.
5) Dot shape sets 15 kinds of dot shapes
6) Dot size magnification can adjust the size of the point
7) The Transparency parameter can adjust the transparency of the point color

3. After completing all the configurations, click the "Run" button to display or update the Wordcloud Map, and the Wordcloud Map will appear in the left canvas.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

21. Network plot

The Network plot function is a graphical model, which is composed of two factors: connections and nodes. Different nodes that are connected are connected by one or more lines, and the size of the nodes is drawn according to the number of correlations. DataColor adds six different node layout methods, including random, graphic, and algorithmic layouts, to give users a better user-defined node experience. It is often used in differential co-expression network analysis to show the association of different genes.

Select

Menu-> Background unspecified -> Network plot -> Network plot

Input

Excel target format file

	A	B
1	ID1	ID2
2	ZTL	ZFN1
3	ZTL	VOZ2
4	PIF5	PIF4
5	ELF3	VOZ2
6	VOZ1	PIF3

Fig: Excel file.

Output

Generate image in the left canvas

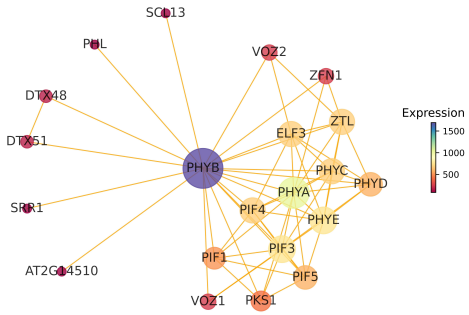

Fig: Network plot output image

Detailed instructions for use

1. First click the file button on the right and select the Excel file to be visualized
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below

1) Set the font size and color of the node.

2) Color bar sets its direction, label font size, label name, size, color, position, and font size.
3) Color maps contain 166 types, which are mainly divided into the following four categories: Sequential colormaps: continuous color maps, Diverging colormaps: color maps that diverge at both ends, Qualitative colormaps: discrete color maps, Miscellaneous colormaps: other color maps. Such as 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc., each suffix _r color map is the original color bar flipped horizontally.
4) Nodes size magnification can adjust the size of the point.
5) The Transparency parameter can adjust the transparency of the point color.
6) The Nodes arrangement parameter adds six different node layout methods, including random, graphic, and algorithmic layouts.

3. After completing all the configurations, click the "Run" button to display or update the Wordcloud Map, and the Wordcloud Map will appear in the left canvas.

4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

22.Geographical heatmap

Geographical Heatmap are map-like heat maps that can be displayed in a visual way with colour values based on the values of each geographical location in the data.

Select

Menu-> Background specified -> Geographical heatmap -> Geographical heatmap

Input

Excel target format file

Location	Values
China	95.1
Canada	23.2
Brazil	43.3
Russia	66.4
United States	88.5
Australia	55

Location	Values
河南	45.23
安徽	10
黑龙江	11
吉林	3
北京	37.56
江苏	16
陕西	11
山西	12
河北	21

Fig: Excel file.

Output

Generate image in the left canvas

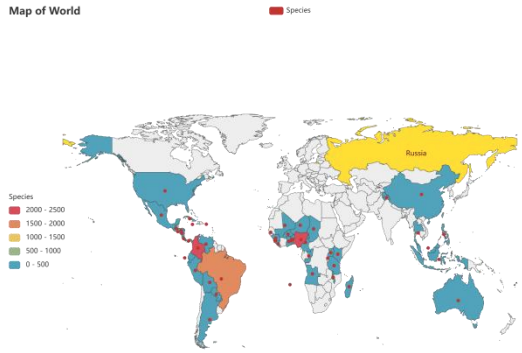

Fig: Map output image

Detailed instructions for use

1. First click on the file button on the right and select the Excel file to be visualised.
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below
    1) Type input the map type, such as "world", "china", "贵州", etc.
    2) Width and Height set the width and height of the map.
    3) Scale-min and Scale-max to customise the total range of values for the Color bar.
    4) Color selects whether the map has a colour bar or not.

5) Color bar sets its orientation selection.
6) Title, table, Color bar can set the label name.

3. After completing all the configurations, click on the 'Run' button to display or update the Map, which will pop up as a web page where the user can click on the download button to save the image.

23.Wordcloud map

A Wordcloud, also known as a word cloud, is a visual representation of text data, consisting of a cloud-like coloured graph of words, used to display large amounts of text data. The importance of each word is displayed in font size or colour.

The Wordcloud is mainly used for frequency analysis of keyword occurrences in text content and is suitable for visualisation of text content mining. Words that appear more frequently in the word cloud are presented in a larger format and words that appear less frequently are presented in a smaller format. The word cloud is essentially a point graph, the result of drawing text with a specific style at the corresponding coordinate points.

Select

Menu-> Background specified -> Wordcloud map -> Wordcloud map

Input

Excel target format file

Description	Count
immune response	20
defense response to bacterium	11
cell chemotaxis	8
cell adhesion	17
complement activation	8
extracellular matrix organization	11
complement activation, classical pathway	8
lung development	7
positive regulation of B cell activation	5
oxidation-reduction process	18

Fig: Excel file.

Output

Generate image in the left canvas

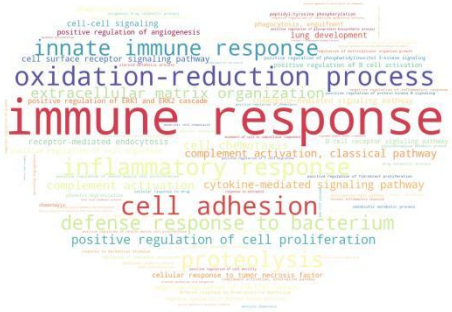

Fig: Wordcloud map output image

Detailed instructions for use

1. First click on the file button on the right and select the Excel file to be visualised.
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below

1) Width and Height set the width and height of the output image.
2) Background colour parameter selects the colour of the background
3) Word distance sets the distance between words.
4) Maximum word count and maximum font size allows you to customise the total range of font size values.
5) Colour map contains 166 types, mainly divided into the following four categories: Sequential colormaps: continuous colormaps, Diverging colormaps: discrete colormaps, Qualitative colormaps: discrete colormaps, Miscellaneous colormaps. Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.
6) 'The color is the same as the background image color' asks if the output image font colour is the same as the background image.

3. Once all configurations are complete, click the 'Run' button to display or update the Wordcloud Map, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.

24.Anatomogram Heatmap

Displaying tissue information effectively in multicellular organisms can be a time-consuming and laborious process. With different colours representing the expression of tissues in anatomical maps, it is easy to spot differences between tissues or tissues and immediately provide the biological context for these observations and grasp the visualisation results more quickly.

Select

Menu-> Background specified -> Anatomogram heatmap -> Anatomogram heatmap

Input

Excel target format file

Organs	Value
root	3
flower	2
leaf	2
fruit	3

Fig: Excel file.

Output

Generate image in the left canvas

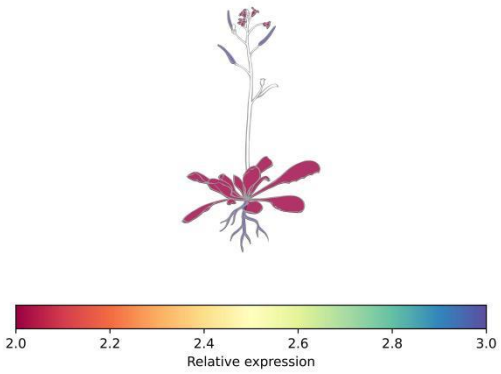

Fig: Anatomogram Heatmap output image

Detailed instructions for use

1. First click on the file button on the right and select the Excel file to be visualised.
2. The default parameters have been set, if you need to adjust the parameters, please see the introduction below
    1) Type selects the desired base map for the deconvolution map
    2) The colour map contains 166 types, mainly divided into the following four categories: Sequential colormaps: continuous colour maps, Diverging colormaps: colour maps with dispersion at both ends, Qualitative colormaps: discrete colour maps, Miscellaneous colormaps.

Other colormaps. For example, 'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', etc. Each suffix _r colour map is a horizontal flip of the original colour bar.

3) Color bar sets its orientation selection.
4) Title, table, Color bar can set the label name.

3. Once all configurations are complete, click the 'Run' button to display or update the Anatomogram Heatmap, which will appear in the canvas on the left.
4. Users can right-click the "Save" export option to export the heat map. DataColor provides 300-1000dpi 6 gears for users to use. There are four image formats: png, .jpg, pdf, and .svg, to meet different needs.