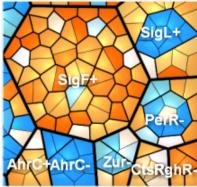


English









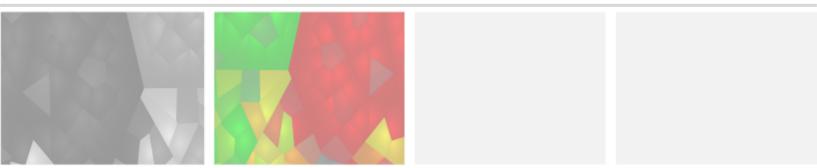
EXPLORING LIFE



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Beginning with Example Data

Paver can create three different types of visualizations:

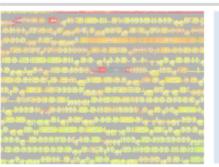
- Treemaps
- Genome Views
- Stream Graphs

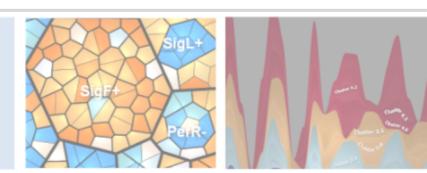
To make it easier for you to get familiar with Paver, we have prepared some example data for each type of vizualization. You can do your first steps by simply loading the example data and playing around with it to see how Paver works. Later, when working with your own data, you can refer to our examples to see, how data should be formatted to be compatible with Paver. Simply have a look at their structure and formatting, and adapt your own files accordingly if Paver has problems with your own files.

Note:-

In this guide we are going to use example data available on our website: <u>https://www.decodon.com/paver-getting-started.html</u> (please scroll down).

The downloaded files are zip - archives; simply extract them into a directory of your choice. You will obtain a subfolder for each visualization type, containing the hierachy structure in two or more formats (e.g. path format and simple format), as well as expression data matching these hierarchies in csv (*Character Separated Values*) format. Technically, all files are simple text files containing the information which allows Paver to make those beautyful visualizations. You can open every one of them with any editor software, which is capable to interpret Linux and Apple text files as well.

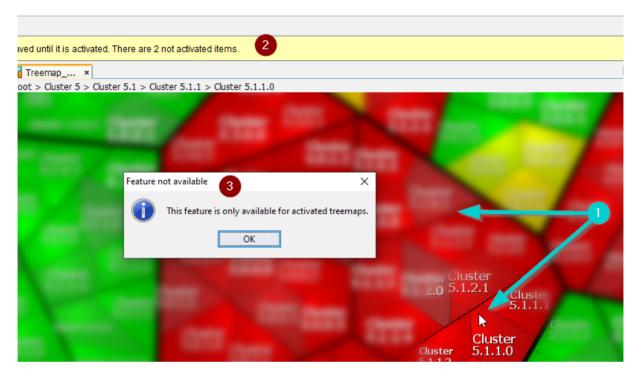






Consumable License Model and Example Data

When opening any data with Paver, you will notice three things:

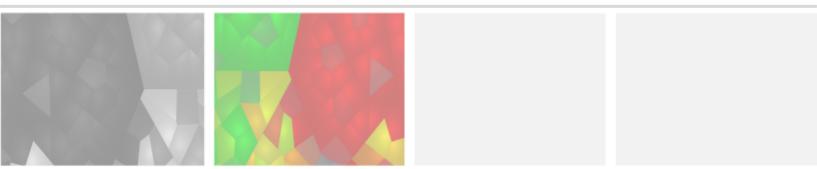


- 1. The representation is all blurred, except for a small region around your mouse pointer.
- 2. A big yellow stripe on the top of the window with a button on its left saying "*Activate*".
- 3. Saving and exporting data is disabled.

The blurred view is the *demo view* you will always get when loading data without either having activated it before or using a full license for Paver. Click on the just appeared "Activate" button to remove these limitations, you will be asked for credentials of an account to activate data with. For your own data, you will need an own consumable account.

To activate the example data for free, please use our evaluation account:

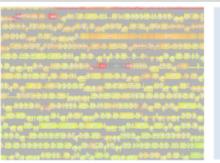
User Name:	eval
Password:	paver

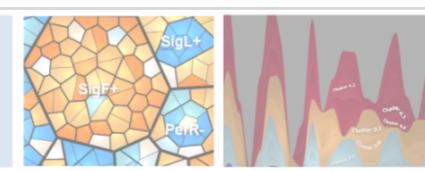




Make sure the treemap and the expression data are selected (they are by default) and click on "*Activate*". After some seconds you will see the Activation Report in a small window and your blurred view becomes clear.

Once activated, these files will always stay activated on your computer, as long they are not modified. Now you can save the created visualizations and load them again later with *File -> Load Visualization*, without having to create or activate them again. Saving makes it easier to re-use your visualization later on, with the same or with new expression data. Thus it can save a lot of time: while calculating these small example files happens really fast, it can take quite long for real complex hierarchies. Reloading such a complex hierarchy as already saved visualization later takes only seconds.





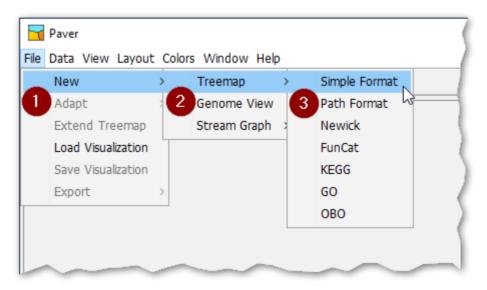


Creating amazing visualizations in two steps

Generally, creating visualizations with Paver goes in two steps:

Create a new Visualization by loading the Hierarchy

Load hierarchy data to calculate the Voronoi Treemap of hierarchy levels and related entities.



Open Paver's *File* menu and tell Paver that

you want to create a new visualization



1

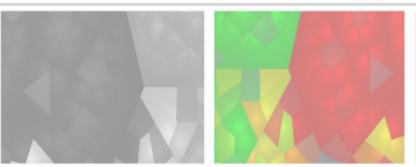
2

3

of this type,

and in which format the hierachy is you are going to load.

A File Chooser will open, allowing you to choose the file you want to open.

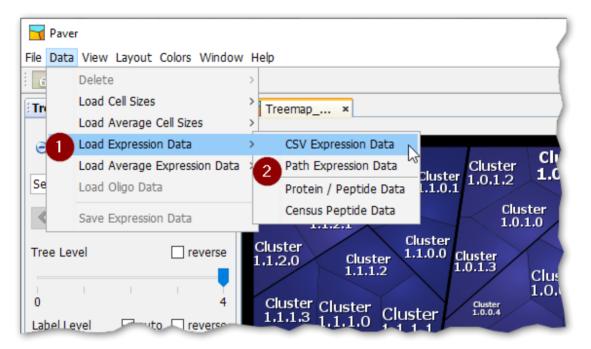


7



2 Load Data

Load expression data to fill the created treemap with life



Now you can involve quantitative data you want to visualize either by the cell size or the coloring of your cluster cells, either individually or by its average:



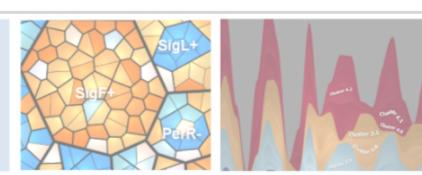
let the data influence the size or the coloring of your cells, either individually or their calculated average



and interprete the data in this format.

Depending of the type of visualization, some additional steps, like e.g. loading additional data rows or finetuning, can become necessary.







Saving and Exporting Visualization

After having created a visualization, you can **save** it for re-using it later on in Paver, or you can **export** it in various formats you can use in your presentation, paper, web application,

To save it, again open the *File* menu and click on *Save Visualization*:

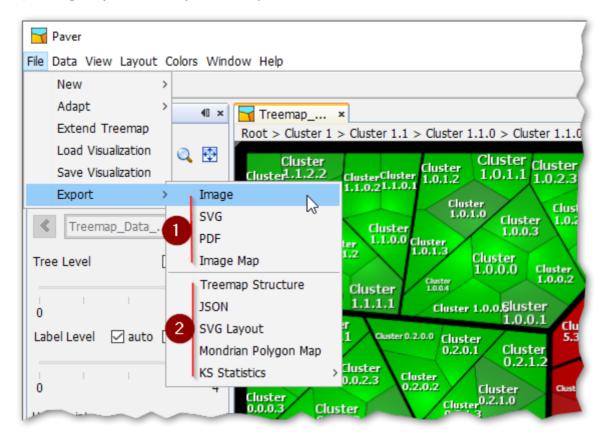
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You can choose a location and a name where to save your visualization. To re-use it in Paver, make sure to choose *Load Visualization* from this menu, (and not *New->*...)

Although the coloring og the cells will be preserved in the state it was saved, you can load other (or the same) expression data, with the same or a different color scheme to illustrate different facts.



Depending on your needs, you can **export** visualizations in various formats:



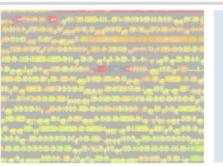
As you can see in the screenshot, you can export a visualization in 9 different formats. According to their characteristics they are organized in two groups:

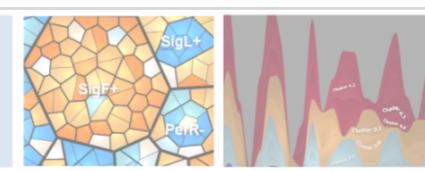


visual formats - maintaining the look of your visualization a you can see it in Paver's window (colors, borders, labels, ...), to be used for illustrations



technical formats - making the structure of your visualization accessible to other applications.







Creating a Treemap

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The folders and files are named according to Paver's menu entries, so you can easily find the matching file(s) you have to load for creating your visualization. Let's create a treemap as example:

- In Paver's menu click on *File -> New -> Treemap -> Simple Format* and navigate to the extracted "*Example_Treemap*" folder
- Pick the file "*Treemap_Simple_Format.tms*" or any variant from the "SimpleTreemapFormat" folder and open it to load the hierarchy file.
- Now choose from Paver's menu *Data -> Load Expression Data -> CSV Expression Data* to load the data files as expression data.
- In the file chooser you can pick one or both "*Treemap_Data_X.csv*" files (where *X* stands for a number) and click on *Open*.

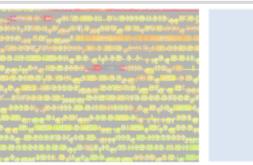


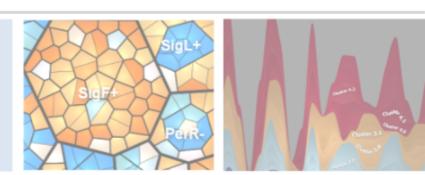
Creating a Genome View

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yclHyclI wclJyclK yclM yclM yclNyclQyclP/clQ ycnB ycnCycnB gabR gabD gabD gabD glcUjdin ycnI ycnI ycnJ
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Creating a Genome View works analogous:

- Click on *File -> New -> Genome View* and navigate to the extracted "*Example_Genomeview*" folder.
- Choose the *Bacillus subtilis 168.csv* file and open it.
- Now choose from Paver's menu *Data -> Load Expression Data -> CSV Expression Data* to load the data files as expression data.
- In the file chooser you can pick one or both "*GenomeView_Data_X.csv*" files (where X stands for a number or other further description) and click on *Open*.







Creating a Streamgraph

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Creating a Stream Graph works works the exact same way:

- In Paver's menu click on *File -> New -> Streamgraph -> Simple Format* and navigate to the extracted "*Example_Streamgraph*" folder.
- Pick the file "*Streamgraph_Simple_Format.tms*" to load the hierarchy file.
- Unlike to the procedure with the other visualizations, you will be asked directly to load your data files. As a second peculiarity of this viszalization type you will need to load multiple data files to obtain a Stream Graph.



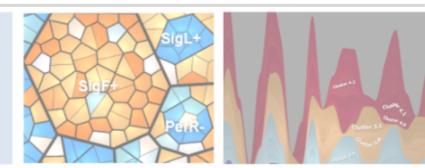
Where Can I Find Out More about Paver?

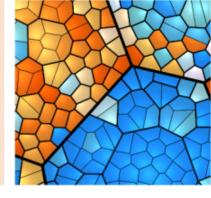
The easiest way to learn more is going to <u>http://www.decodon.com</u> or contacting us per Email to <u>info@decodon.com</u>. We will be happy to answer your questions or to show you more in a live web demo.

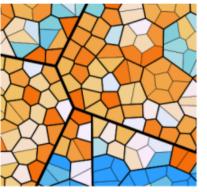


If you have any comment or suggestion regarding this 'Getting Started with Paver Guide' or any other of our documents we welcome hearing from you.









Request you personal demo today!

Want to know more? Contact us today to arrange your personal live web demo. All you need is a web browser and a phone – an expert will show you how you can apply Paver to visualize high-level expression patterns.

You can download an evaluation version of Paver from www.decodon.com. Your questions and remarks are welcome, call us at +49 3834 515230 or send an email to info@decodon.com.

Technical data:

Supported Classification Schemes: Paver supports

- Gene Ontology
- KEGG Brite
- Riley scheme derivatives (e.g. TIGR classifications, Genolist classifications)
- Clusters of Orthologous Groups (COG)
- Open Biologicy Ontologies (OBO)
- gene regulatory data
- custom classification schemes.

Supported Export Formats: Paver supports the export into the graphical formats image (PNG, TIFF, JPEG, BMP), vector based SVG, SVG Layout, PDF, Mondrian Polygon Map and html Image-Map. Furthermore Paver supports export of the treemap structure in XML and JSON, and of the Kolmogorov-Smirnov-Statistics.

Supported Operating Systems (*recommended): Paver runs on Windows 10* / 8 / 7 / Vista / XP at 32 or 64* bit, Mac OS X 10.7.3 (Lion) or higher, and most flavours of 32 bit or 64* bit Linux.

Hardware Requirements:

Minimum Hardware:

Pentium III, 800 MHz, 2 GB RAM or Intel-based Mac, 2 GB Recommended Hardware:

Dual or Quad Core Processor with 2 GHz or better, 4 GB RAM or more, in combination with a 64-Bit operating system

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