

CEDAR FAQ

August 16, 2022

What is this document about?

This FAQ might be interesting for you, if you just learned the cedar basics and now want to start your own cedar project. It does not replace a beginner tutorial, which explains the basic concepts of cedar, just as creating steps, manipulating a step's parameters and connecting them.

For a beginner tutorial see: https://cedar.ini.rub.de/tutorials/graphical_user_interface/.

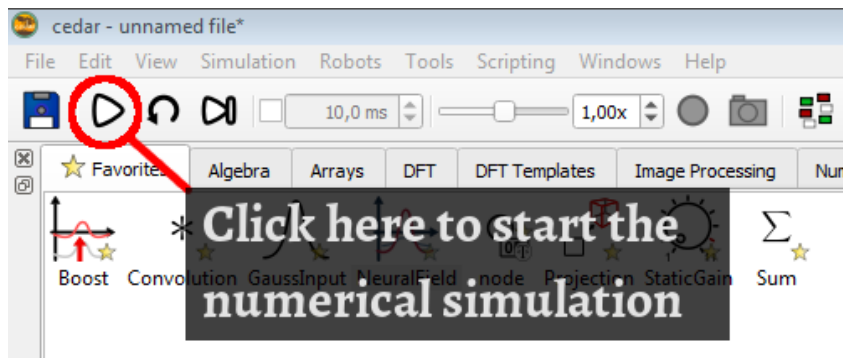
If you want to help us and other cedar users and add questions to this FAQ, please mail your suggestions to cedar@ini.rub.de. We will gladly include them in the next iteration of this FAQ.

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1. I connected all parts of my architecture, but nothing is happening.

- ▶ It might be the case that your simulation is not yet running. To start the numerical simulation, press the *Play* button in the top-left corner.



2. Do you have useful tips to speed up the architecture building process?

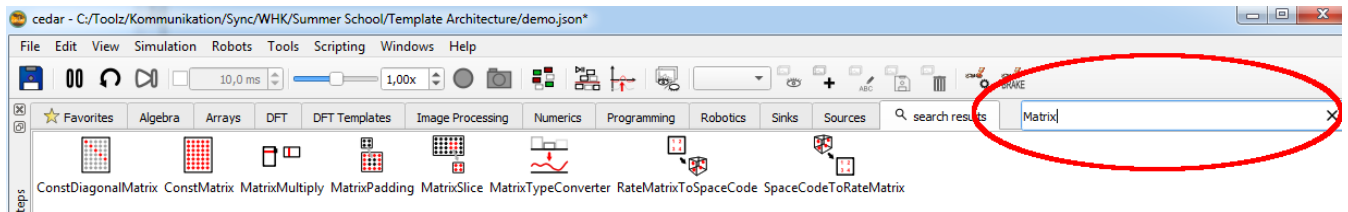
- Do not reinvent the wheel - copy old parts of your architecture. To duplicate your current selection in the canvas press **Ctrl + D**.

Tune each part of the architecture individually using “fake inputs”, such as **Boosts** or **GaussInput**. It might be tempting to connect an entire architecture right away, but tuning multiple connected fields takes up a lot of time. It is good practice to look at each field in isolation and check its parameter settings by applying different inputs. Once you are sure that your field is in the desired regime, e.g. selective or self-sustained, you can connect it to the rest of the architecture. This practice cost time up-front, but usually saves a lot of time in the long run. (**Ctrl + B** opens the boost overview).

3. I am looking for a particular step. Where can I find it?

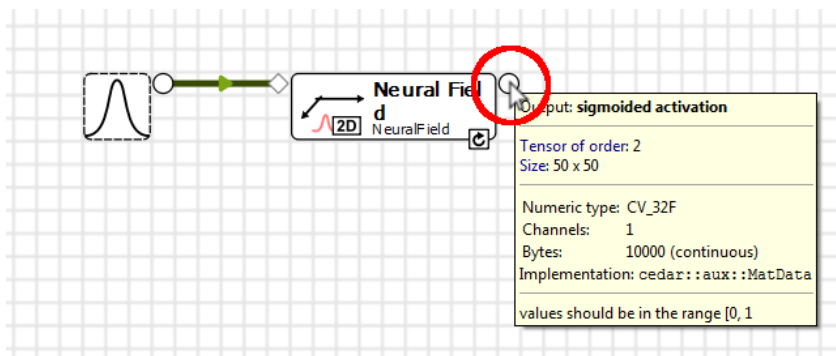
- The *Favorites*-Tab contains all the steps you need to build most of our architectures. Sometimes you may need a specific functionality, which might be covered by one of the many steps hidden in the other Tabs. Cedar has grown quite a bit in the recent years and it might be difficult to find what you are looking for. You can, however, use the search bar in the top-right corner to quickly filter through all available steps.

Searching might also be useful to find a step-instance in your current canvas. To search for a step with a specific name, press **Ctrl + F**.



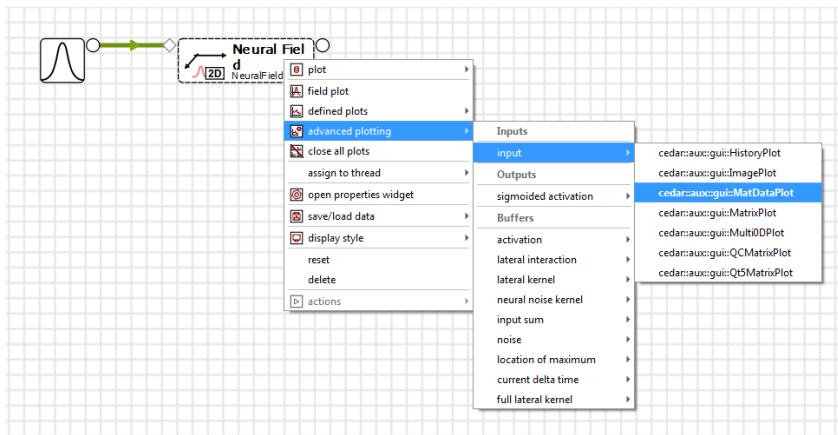
4. How can I determine the dimensionality and size of the output of a given step?

- The cedar canvas offers additional information on its elements if you hover above them with your mouse. To get detailed information about an output hover above a step's output slot.



5. How can I open a specific plot for any step on my canvas?

- The context menu of any step on the cedar canvas can be opened by right-clicking on the step. Here you can choose from multiple plotting options. For a quick overview *plot all* is usually the fastest option. If you want to open a specific plot, e.g. only the input, choose the option *advanced plotting*. You have the option to choose between different types of plots, typically the highlighted **MatData** is the best choice.

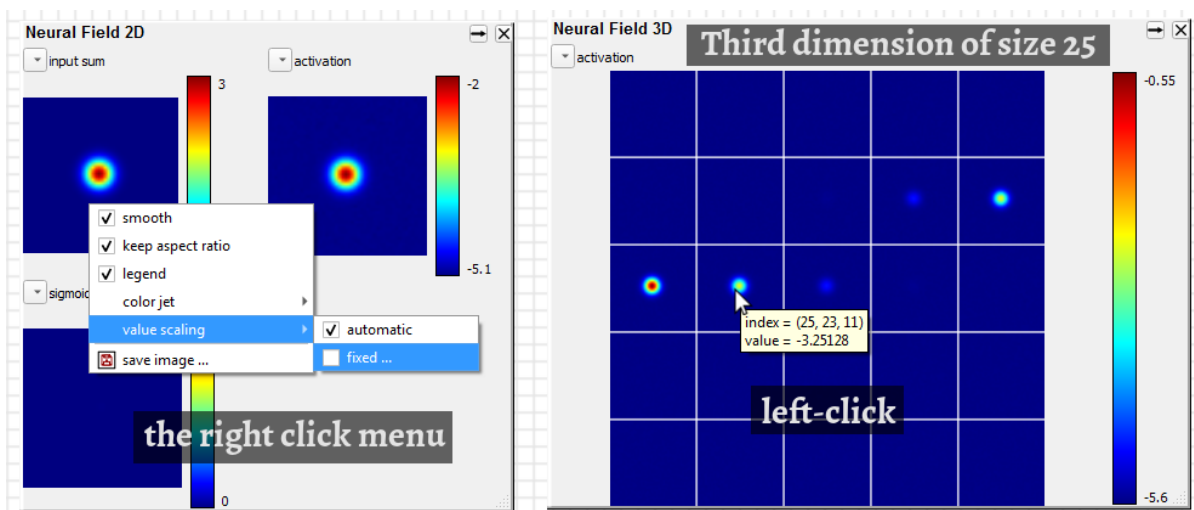


6. How can I make sense from multi-dimensional plots?

- There are different ways you can interact with the cedar plot window to see more than “colors”. Each plot showing more than one dimension encodes the actual activation value through color. The legend bar right next to the plot does show you the range of these values. You can enable/disable the legend by right-clicking on the plot. To determine the current value of a certain location in your plot, left-click and hold down your mouse-button on that location.

The default setting automatically adapts the color-legend to the new minimum and maximum values. It might make sense to set a fix minimum and maximum value, for plots that vary a lot. To do so right-click on the plot and choose *value scaling* → *fixed*. You can now enter a new minimum and maximum value for the color legend.

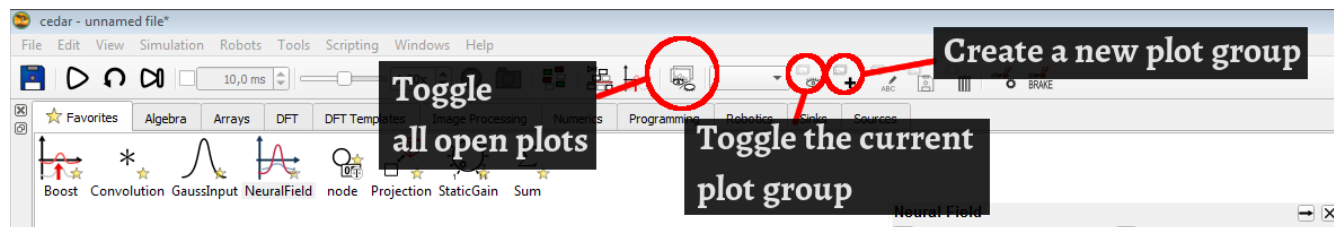
Three-dimensional plots might look unfamiliar at first, because they are not three dimensional at first glance. Each three-dimensional plot displays multiple two-dimensional plots, one for each possible value of the third dimension. You can think of each two-dimensional plot as one slice of the three-dimensional tensor. Use the left-click feature to find out, which slice corresponds to which value in the third dimension.



7. I have opened too many plots. How can I visualize my architecture without manually closing all plot windows?

- Multiple plot windows may clog up your screen to the point that you cannot navigate through your architecture anymore. Cedar’s tool bar offers two solutions to this problem. The quick-and-dirty solution is

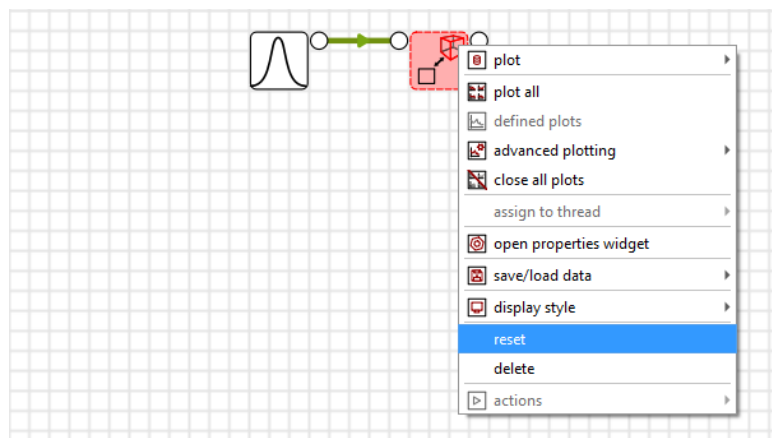
to toggle the visibility of all open plots, which can be achieved by clicking on the corresponding button (see Figure below). To save a particular ensemble of open plots, you can also use the plot group functionality. A plot group saves the currently open plots under one name. You can toggle the visibility of that group individually.



8. Help! A step is colored in red and does not work. What to do?

- A step colored in red signals that not all requirements for computation are met. In most cases this means an input is missing or not matching the required input dimensions. In that case change the input of the step.

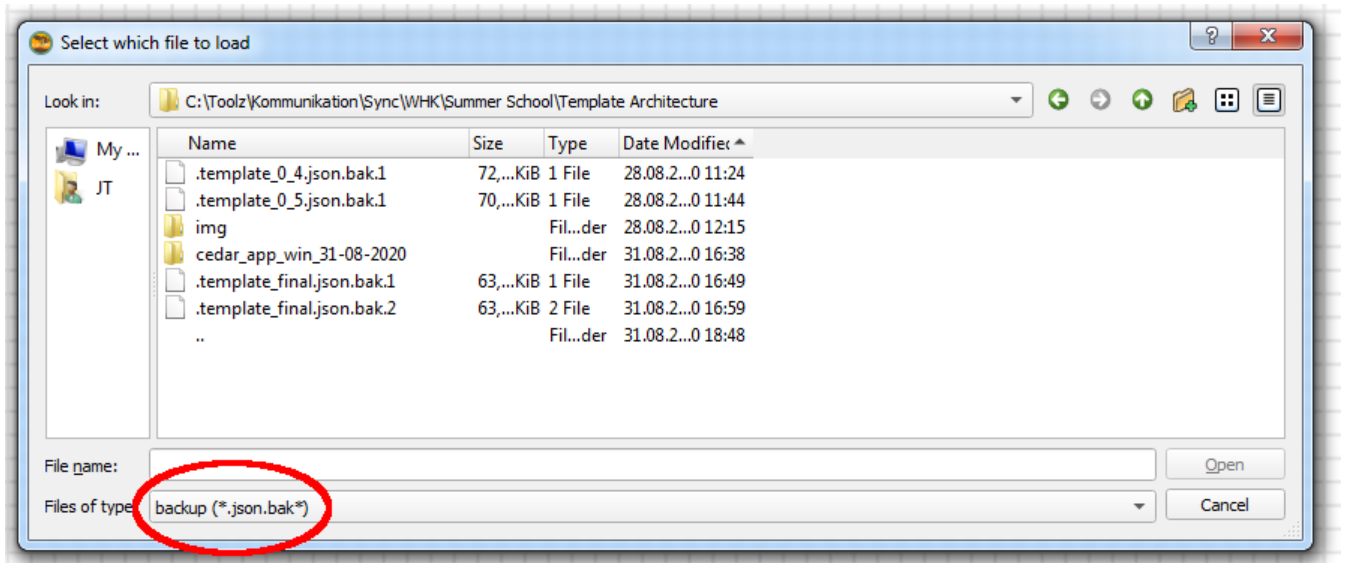
Sometimes it might be the case that some internal variable of the step turned invalid. It might stay red, even though all inputs match the requirements. In that case use the right-click menu and choose *reset*, which should enable the step once again, if everything else is set-up correctly.



9. Cedar crashed! Have I lost everything?

- Although we try our best to keep the software stable and up-to-date at all times, it might happen that cedar crashes unexpectedly. Do not worry though, we have an auto-save feature that periodically saves your architecture.

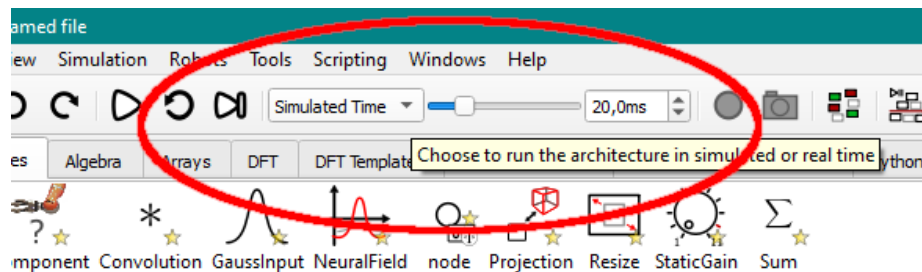
To load an architecture backup file navigate to *File* → *Open File...* and choose *backup* as the desired file type. You should now get a list of *json.bak* files. Sort by *Date Modified* to get the most recent one (The numbers have no meaning).



10. How can I control the speed of my simulation?

- Sometimes it might be desirable to slow down the simulation to better observe what is actually happening, while in other cases you are just interested in some end result and therefore want to speed up the computation time.

To this end you can control the stepsize of the simulation's Euler step. The stepsize governs how much time should elapse between two computation steps of the simulation. If you choose a very small stepsize your numerical simulation will be very precise but also very slow. Vice versa a higher step size will speed up your simulation while also making it less precise. **Be careful** high stepsizes might lead to your simulation becoming unstable depending on your particular field parameters.



If you are interested in your simulation running approximately in real time, because you want to, for example, connect your architecture to a real robot, then you can choose the simulation mode “real time”. In this mode the stepsize is the real elapsed time between computations, but it might lead to some computations being skipped, if the architecture takes too long to compute.

If you want to further modify the details of the numerical simulation you can do so in the menu under *Tools* → *Thread Control*.