Stochastic mapping branches

Version 1.1.0, by Giorgio Bianchini

Description: Plots branches with data from a stochastic mapping analysis.

Module type: Plotting

Module ID: `f7a20f2f-94b2-4331-8bbf-4e0087da6fba`

This module plots the results of a stochastic mapping analysis. The analysis must have been previously set up using the *Set up stochastic mapping* (id `32858c9d-0247-497f-aeee-03f7bfe24158`) or the *Set up stochastic mapping (attachment)* (id `0e2f5255-2d34-474b-955d-b531ee5ba605`) module.

Parameters

Total characters

Control type: Text box

This text box shows the total number of characters that have been set up and can be plotted.

Enabled characters

Control type: Source code

This parameter contains a script that is used to determine which characters are enabled in the plot. Each character is associated to a boolean value - `true` means that the character is enabled, while `false` means that the character is not enabled. This can be changed more easily using the Wizard edit enabled characters button.

Wizard edit enabled characters

Control type: Button

State colours

Control type: Colour (by node)

Default value: #DCDCDC (opacity: 100%)

Default attribute: `(N/A)`

This parameter is used to determine the colour associated to each state. While this uses a "Colour by node" control, the colours are actually determined based on the names of the states, rather than on attributes of the tree. The colours associated with each state can be changed (or additional states can be added) by modifying the formatter code for this parameter.

The colour associated to each state can be changed by changing the RGB values in the `Colour.FromRgb` method calls. The possible states can be changed by modifying the `case` labels in the `switch` statement.

The colours can also be changed more easily by using the Wizard edit state colours button.

Wizard edit state colours

Control type: Button

This button opens a window that can be used to specify the state colours using a graphical interface.

Position shift

Control type: Point

Default value: (0, 0)

The value of this parameter corresponds to a shift in the position of all the branches. Useful if you wish to plot multiple histories on the same tree.

Branch thickness

Control type: Number spin box

Default value: 5

Range: [0, $+\infty$)

This parameter determines the thickness of the branches.

Style

Control type: Drop-down list

Default value: All states

Possible values:

- All states
- Most probable states
- Maximum a posteriori

This parameter determines the style of the branches.

If the selected value is `All states`, a "thick" branch is drawn using multiple colours, and the thickness of each colour is proportional to the probability of the state represented by that colour.

If the selected value is `Most probable states`, the branch is drawn using only one colour at a time, corresponding to the state(s) that pass the filtering process defined by the Dominance threshold and the Exclusion threshold.

The filtering consists in the following:

- First, all states whose probability is lower than the exclusion threshold are excluded. However, if no states have a probability higher than the exclusion threshold, all states are retained.
- Then, the remaining probabilities are scaled so that their sum is 1.
- Finally, all states whose scaled probability is lower than the dominance threshold are excluded. However if no states have a probability higher than the dominance threshold, all states are retained.

If only one state passed this filtering, the branch is drawn in the colour corresponding to that state; otherwise, the branch is drawn using dashes of colours corresponding to the the filtered states.

If the selected value is `Maximum a posteriori`, the history with the highest posterior probability is shown, i.e. a history in which the state of each branch corresponds to the most probable state at each point in time.

Dominance threshold

Control type: Slider

Default value: 60 %

Range: [0 %, 100 %]

If the Style is set to `Most probable states`, this parameter determines the dominance threshold.

Exclusion threshold

Control type: Slider

Default value: 10 %

Range: [0 %, 100 %]

If the Style is set to `Most probable states`, this parameter determines the exclusion threshold.

Dash unit

Control type: Number spin box

Default value: 5

Range: [0, +∞)

If the Style is set to `Most probable states`, this parameter determines the spacing between dashes of different colours used to draw branches with a "mixed" state.

Gradually increase thickness

Control type: Check box

Default value: Checked

If this check box is checked, the branch starts off with thickness 0 and then grows bigger.

Thickness maximum

Control type: Slider

Default value: 0.20

Range: [0.00, 1.00]

If the Gradually increase thickness check box is checked, this parameter determines when the maximum thickness is reached.

Add legend

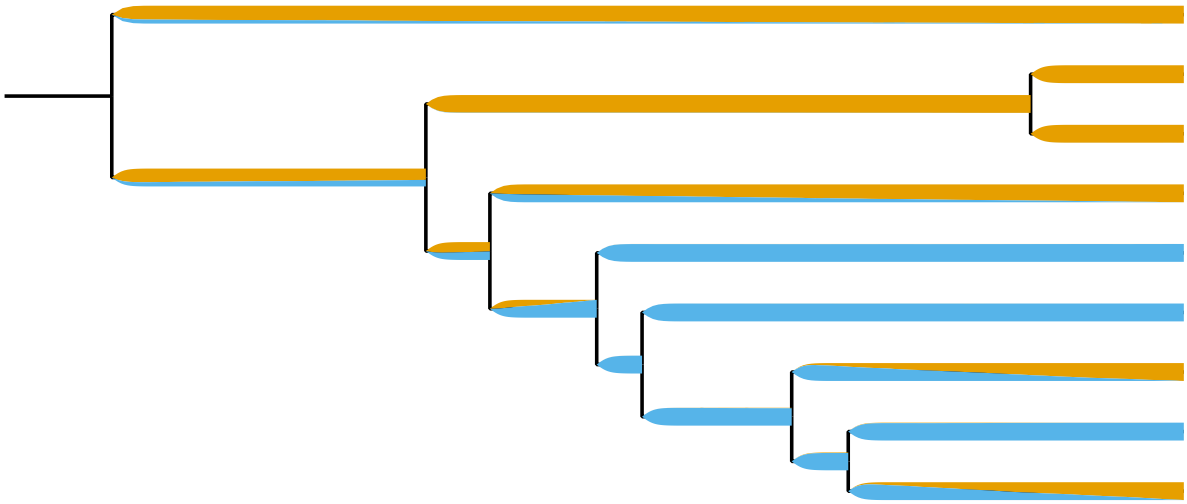
Control type: Button

This button adds an instance of the *Legend* module containing a legend of the colours associated to each character state.

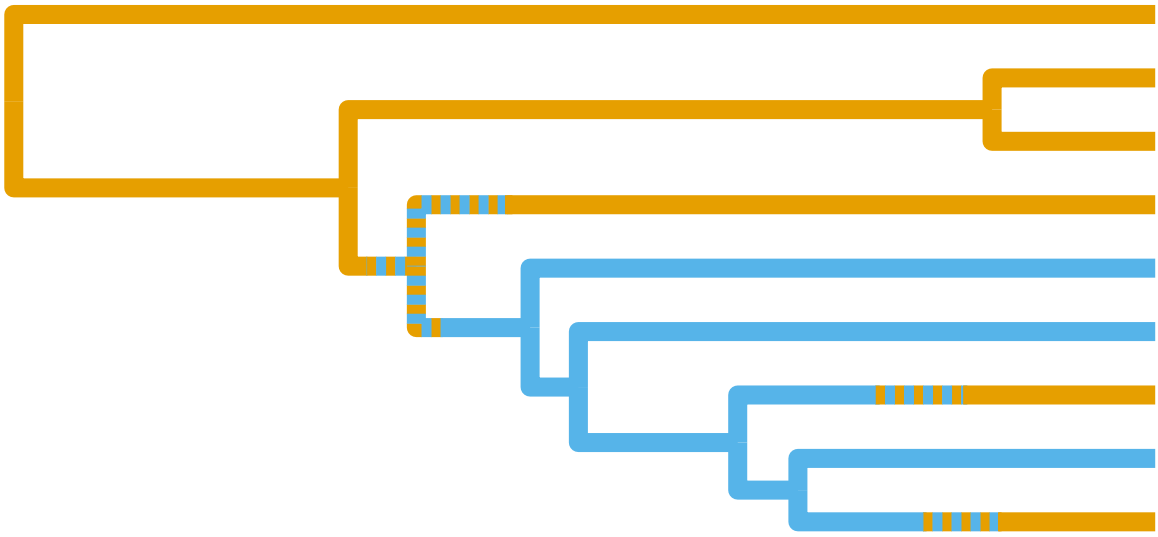
Further information

The appearance of the plot will change depending on the value for the Style parameter.

Here is an example of a plot in which the Style was set to `All states` (the black parts of the branches are due to a *Branches* module also being enabled):



This is an example of a plot where the Style was `Most probable states`:



Finally, in the following plot the Style was set to `Maximum a posteriori`: