Breach Issues

# Questions

## Robustness heat maps

Are we correct to assume that the robustness “heat maps” are produced using the method PlotRobustSat of BreachSystem?

It seems that this method involves precomputing the robustness values, via the method GetSatValues. We do not fully understand how precomputed robustness values are stored. For the purpose of computing IO robustness, we could chose to also precompute those values and either store them in a separate structure or in the same structure.

## Interpolation

How can one control the use and display of linear interpolation?

In this case, are zero crossings of robustness signals interpolated? If not, this could be a problem for Boolean signals when plotting of robustness values.

# Remarks

## Definition domain of satisfaction signals

In STL\_EvalThom, I think the following is not correct:

time\_values1 = [time\_values1 time\_values1(end)+I\_\_\_(end)];

This seems to increase the size of the definition domain instead of shrinking it.

Should it not use -I\_\_\_(end) instead?

In general the notion of definition domain is not very appropriate, because of the different way [0,1e10] and [0,inf] are treated. In the first case, the robustness signal is nowhere defined and in the other case is everywhere defined. It could be removed by using the standard interpretation of quantification over partial domains in logic.

## Missing arguments in STL\_Eval

In STL\_Eval, we call STL\_EvalThom in the case where ischar(phi). Should we not call STL\_Eval(...,args) instead with whatever args are passed?

## Broken example script

In test\_PlotRobustMap, should we replace simple\_spec.stl by AFC\_simple\_spec.stl?

Also, this test script goes into error in my version of Breach even after this change.

## Naming of Plotting functions

It is not immediately clear that PlotRobustSat, in addition to plotting, also takes care of computing the robust satisfaction value. Same remarks apply to other plotting functions. Perhaps different naming convention could indicate that some robustness computation is also involved?