SimuLink to SpaceEx Translator (SL2SX)

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1 Requirements and Raccomandations

1. Supported Blocks:
   - SubSystem, Inport, Outport, Constant, Gain, Sum, Product, Integrator
2. Block Mirroring is supported, but the related connection-lines could be not exactly the same as the SL source (only in the graphical shape)
3. Do not use the Workspace (it is not allowed to use, in the definition of the Block Parameter, a symbol defined in the workspace in place of the number)
   - As a consequence: do not use blocks that calls"OpenFnc" to initialize the system
4. To complete the SpaceEx configuration file, with initial states and the output variables to show (the stoptime of the simulation is already supported and then written in the file)
5. The name of a block can not be defined in more text lines (i.e. do not use Carriage Return in the definition of a block name)
6. Avoid same name for different subsystems

2 Identified Bugs

1. There is a problem when the exported (by the Mathlab command "save_system") .xml file contains the special sequences of characters "&gt", "&lt", and similaria, used to express the single characters ">", "<", and others: it is necessary to edit the .xml to replace each of these occurrences with the corresponding character.

3 Utils

- To export the Simulink model (in format .sxl or .mdl) into the .xml format the command is (on the Matlab command line):
  - *Save_system('filename.mdl/.sxl', 'filename.xml', 'ExportToXML', true)*

4 Parameters inside the source code

1. It is possible to change the level of the console verbosity during the translation, by the three variables *PrintSystemInfo* (if false, no info are given), *PrintBlockInfo* (if true, every time a Simulink Block is processed, the related info are displayed), *PrintVarsInfo* (if true, every time a SpaceEx variable is created, the related info are displayed). The variables are defined in the class *SLContentHandler*.
2. It is possible to change the (graphically) left-upper corner of the resulting spaceex model, by changing the value associated to the variable *hshift* in the class *SLContentHandler*. This value is important to avoid that inside the SpaceEx Editor, the list of variables overlaps part of the graphical model.

5 Future Extensions

1. Supporting other block type: switch, relay, deadzone and all the basic logic blocks (and, or, not, ...)
   - to do: complete the work on the urgency (and the global implementation in SpaceEx)
2. Supporting wireless signals:
   - To do: add in the SpaceEx editor the possibility to hide lines (more: possibility to change colors, thickness, ...)
3. To establish the initial states
4. To establish the output variables to show
   - Proposal: from the inputs of Scope blocks
5. To automatically write the complete SpaceEx configuration file