Work progress

Week 1
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1 Software installation

the following softwares are installed and tested :
CocoSim dependencies :
Matlab R2016a and R2015a,
Zustre,
Python2.7
Z3,
LustreC (2 versions https://github.com/coco-team/lustrec and
https://cavale.enseeiht.fr/git/lustrec).

For testing objectives I installed the following Verimag tools :
Lustre-V4 Verimag release (lesar, luciole, lus2ec …)
Simulink2Lustre and Stateflow2Lustre (s2l, sf2lus, ss2lus).

2 Documentation about stateflow to Lustre

All documentation that I use are in "doc" folder in my github
(https://github.com/hbourbou/stateflow2Lustre-automaton/tree/master/doc)

The most interesting documents among them are :

TR-2004-16 : Technical report of emsoft04 article : *"Defining and translating a "safe" subset of Simulink/Stateflow into Lustre" N, Scaife, C. Sofronis, P, Caspi, S, Tripakis and Maraninchi 2004.*

Other documents are used to understand some technical details in Lustre or Stateflow.

Please feel free to send me any documentation you think it will help.

3 Presentation Verimag Vs Automaton

I made a presentation (https://github.com/hbourbou/stateflow2Lustre-automaton/tree/master/reports/presentation_Verimag.pdf) that resume what is done by Verimag about translating Stateflow2Lustre and my version of translation. This presentation is not yet finished and it has the current plan :

1. Abstract

2. A safe subset of Stateflow

2.1 A short description of Stateflow

2.2 The interpretation algorithm

2.3 Semantic issues with Stateflow

3. Simple conditions identifying a "safe" subset of Stateflow

4. Lustre and automaton (**pre**, **when** and **current** operators, explanation of **Until** and **Unless**)

5. Translation into Lustre

5.1 Encoding of states Verimag version

5.2 Translation into Automaton : First Version.

It contains my first version of translating Stateflow to Automaton, this version is tested with 3 examples and compared with Verimag version using LustreC compiler. The objective is to translate as many examples as I can in order to find the general conception to all examples.
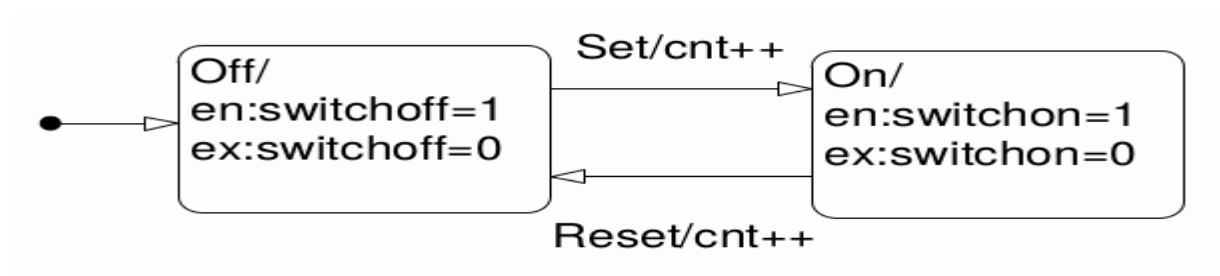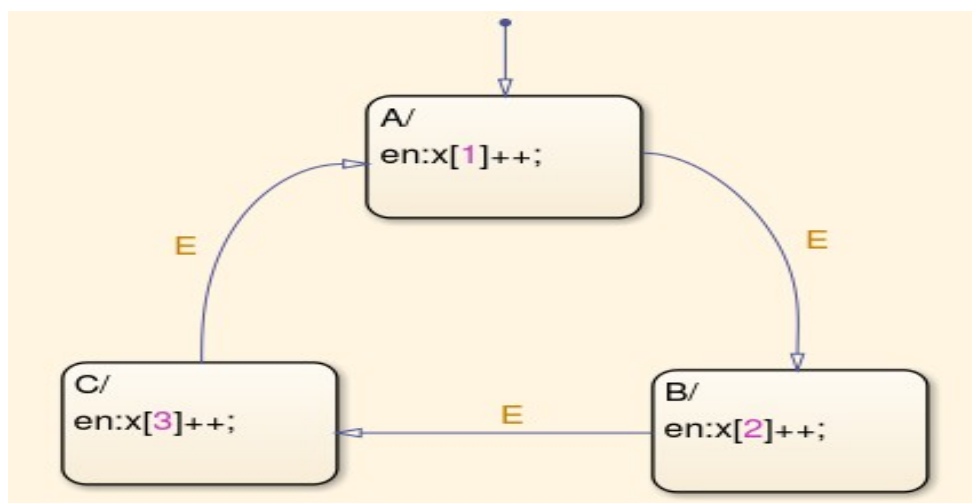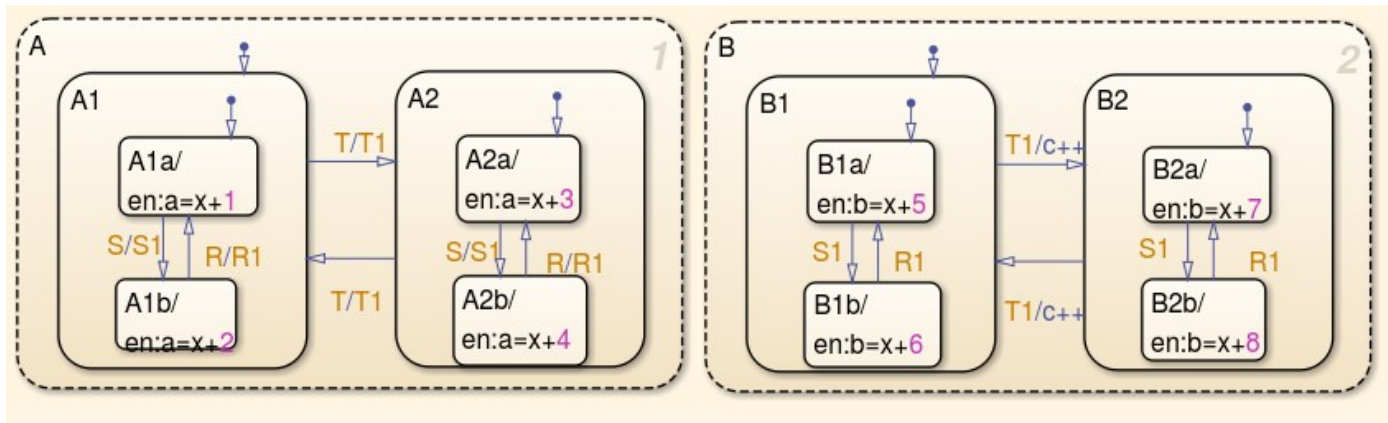
The Example tested and validated are :
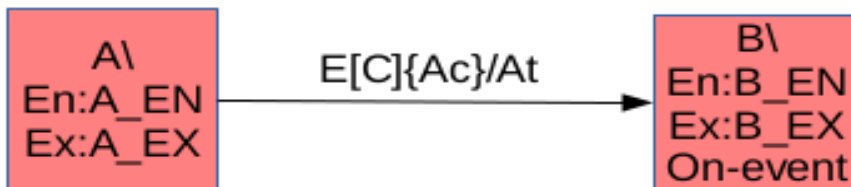

Figure 6: A simple STATEFLOW chart

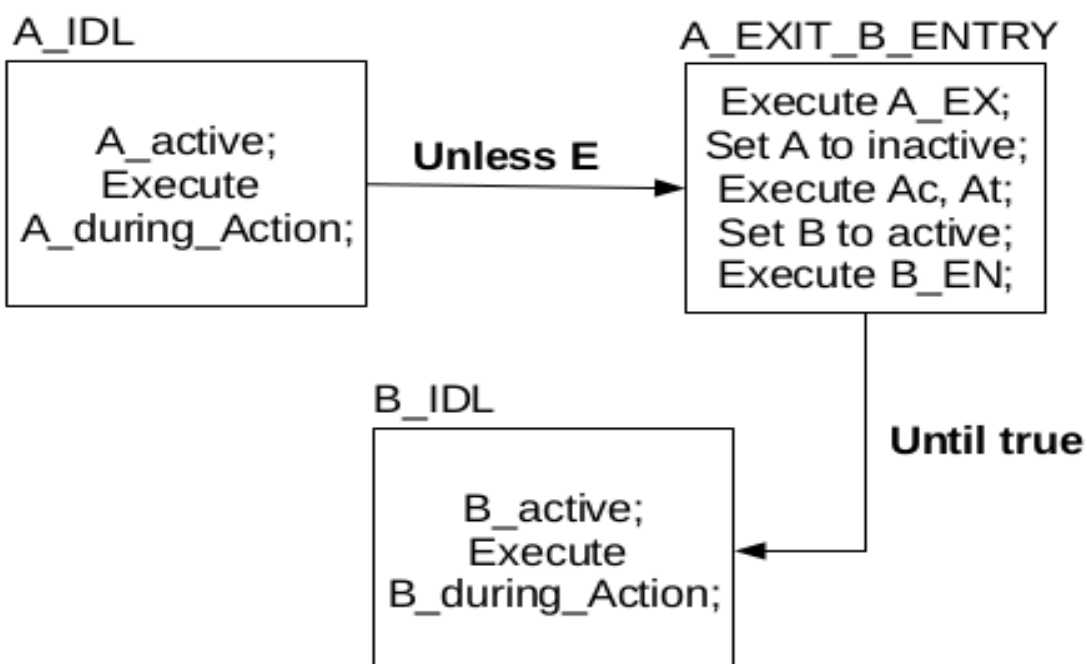The following example is not yet finished, I am working on it.

My first version of Translation is :

En : entry Action;
Ex : exit Action;
On-event : on event Action;

Stateflow example :

Automaton version :

4 What to do for next week

I am planing to :

- Finish examples and their translation,

- Write the general Algorithm for all tested examples,

- Implementing the Algorithm in Matlab to generate automatically the Lustre code.