Series 4. State Machine

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Handout on Thursday, 12 March 2015   Due on Tuesday, 17 March 2015, 22:00

Reading
Study the lecture notes and source code available at http://diuf.unifr.ch/pai/rob > Lectures.

1. State Machine: advanced lover and explorer behavior revisited
a)   For one e-puck, design, implement, test and comment a state machine having :

– three states: STOP, ADVANCED_LOVER and EXPLORER, and

– three events: stop, execAdvLover, execExplorer.

Hint: A template code is available at http://diuf.unifr.ch/pai/rob > Exercises, which gives some hints. But if you prefer you can design your own solution.

b)   Suppose we remove the state STOP. The remaining state machine is still correct. Unfortunately this reduced state machine cannot be implemented in Aseba. Why ?

2. Event Execution Killed Problem
If an e-puck receives an event e during the execution of some code he will immediately jump to the code associated to e, without executing the remaining code he was working on before receiving e. In other words, when receiving an event, an e-puck should not execute any code, cf. Fig. 2. This phenomena is called the *Event Execution Killed Problem*.

a)   Write and test a little program in the simulator and the physical arena that illustrates this phenomena. Explain the idea of your code and the result you obtained when running your program.

Hint: your program should illustrate safe as well as unsafe behaviors.

b)   Sketch an extension of the Aseba implementation where the execution of the code associated to an incoming event is delayed till no code is executed.
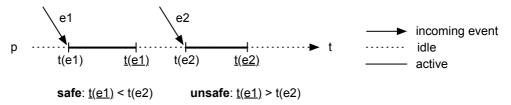

Figure 2. Illustration of the Event Execution Killed problem

Hint: no template code is given for this exercise, i.e. you have to write it from scratch.

Hand in. Upload your answers as well as your source code from the simulation and the physical arena to http://diuf.unifr.ch/pai/rob > Upload by following the online recommendations.