

Simulation of UML StateChart

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Introduction

Part I

Presentation

Presentation of the project

1.1 The goal

The goal of this project is to create a simulator of Statechart which can be use with UMLDesigner. This simulator should permit to visualize and debug a model of a state machine. Moreover, UMLDesigner is a modeling software for UML model and Statechart, so we could create the model and simulate it on the same tools. The picture 1.1 represent the aim of this project.

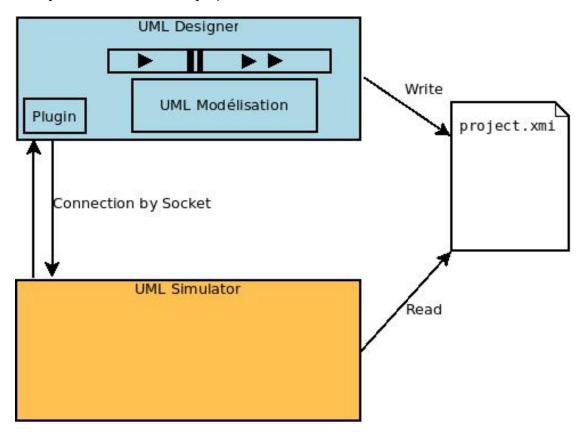


Figure 1.1: Description of the project

1.2 Tools at the disposal

At the begin of this project, some of the tools, which were needed, existed. In fact, ULMDesigner is a UML modeling tool develop by *Obeo*. However, it didn't exist yet

a simulator for Statechart adapted for UMLDesigner. On the chapter 2, the running of UMLDesigner will be discuss.

Then, Mr Ciprian Theodorov, one of my professor, has developed a simulator for Statechart. This simulator needed to be improved, but it composed a good beginning for this project.

UMLDesigner

UMLDesigner is a graphical tooling to edit and visualize UML models created by the French company: *Obeo*.

It is an open source software.



Figure 2.1: UMLDesigner logo

2.1 Kernel

UMLDesigner is based on a Eclipse kernel. The interface is the same as Eclipse. You can notice on figure 2.3 that the menu are the same in the both software.

UMLDesigner use also Sirius. Is an Eclipse plugin which permit to represent diagrams. Sirius was created by *Obeo* to Thales.

Then *Obeo* develop a plugin to adapt diagram product by Sirius as UML diagrams.

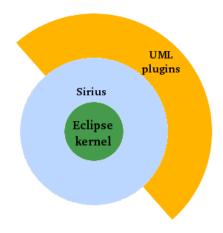


Figure 2.2: The UMLDesigner kernel

2.2 Operation

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Figure 2.3: Screenshot of UMLDesigner

Simulator

3.1 Description

At the beginning of this project, we had at our disposal the simulator of Mr Teodorov (figure 3.1). This simulator simulate a uml file. The uml file need to have a particular architecture.

			Plug Simulator		×
File					
∂ restart	🗢 step back	Step forward	💐 step randomly		
initialize				[0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,	ate = s0, ever State = s0, ev nl.internal.imp ntState = idle,

Figure 3.1: Mr Teodorov simulator

Part II

Study of the subject

Communication inter process

4.1 Type of communication conceivable

A lot of type of communication inter process were suggested to create a discussion enter the plugin and the simulator. But we will present only the most consistent.

The communication is the part the most important of this project, because that will implement the interface between the two software.

Socket

Advantages	Drawback
Work with every simulator type	communication synchronous
(python, java,)	

File

Advantages	Drawback
Problem when two software want to	Communication asynchronous
change the same file at the same mo-	
ment	

Named pipe

Advantages	Drawback
It is possible to use the Simulator out-	
side the graphical modeling tool	

Shared Memory

Advantages	Drawback
It is possible to use the Simulator out-	
side the graphical modeling tool	

Thread

Advantages	Drawback				
	problem if the thread don't avance at				
	the good speed				

Heritage

Advantages	Drawback
Easy to implement	Need to add code in the simulator
	We can only use simulator in Java

Our solution

The solution was not in this list of common way to communicate inter process. In fact, we use the *Runtime* class which is in the java library.

Advantages	Drawback
It is possible to use the Simulator out-	
side the graphical modeling tool	
Work with every type of simulator	

Conclusion

Annexe

 $_{\rm APPENDIX}\,{\bf A}$

Organisation of the work

A.1 Calendar

Tasks/weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14
State of the art	-	-												
Work on the plugin			-	-	-									
Unit tests						-	-							
Improve the simulator								-	-					
Other simulator										-	-			
Redaction		-	-	-	-	-	-	-	-	-	-	-	-	
Soutenance														-

A.2 Tools use for the project

The Framaboard application:

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En attente (5)	En cours (2)	Terminé (16)
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#10 - Assiyet a unitim Add.debugger.actions		#24 - Assign à unition Create un object aimulation in the plug in User Interface © 19
226 - Ausyni a untein Put the simulateur outside the plugin User Interface		223 - Asigné à umbin Find good pattern User Interface () Po
#22 - Assiyol 3 umlaim Unit. Test User Interface @ Po		
		E12 - Anigni à umbin Test of communication [UMI, Simulator] [] Po
		223 - Assignt à uniton Propose plan for the project User Interface Concentration Conc
		E38 - Assipel à unitien Execute a new application from the plugin User Interface © 6CA7/2016 () 19
		Elso - Anipei à umbin understand the simulator and the parsor UML Simulator Bec.17.2016 @ P0
		E15 - Anigné à umbin Compile UML Simulator UML Simulator ■06/17/2016 @ 160n P0
		#20 - Assigné à umisim Propose way to communicate

Figure A.1: screnshot of the framaboard

The web site of MSDL researcher:

WSDL M. Sc. Studert Modelling, Simulation and Design Lab Descriment of Mothematics and Computer Science Enable.Response Best. Fance 2020	e-mail: michael.r/gau/ganta-betagna.org www: http://meti.cs.mcgit.csgegeergaud	Michaël Rigaud
Home I am a Mittary Software Engineering computer science master student at Ensia Bretagne. This page is for my research internships, supervised by <u>Port. Hans. Vangheluse. Ptopled</u>		
Mitcl Mile Ta dic.List The result of my work will be a simulator and debugger for UML Statischart. The research will bald a plag in for UML designer which parmit to see a simulation of statischarts.		
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Figure A.2: MSDL web site

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