



13<sup>ème</sup> Journée Capsis

## Avancement Capsis 2010-2011

François de Coligny  
5 avril 2011

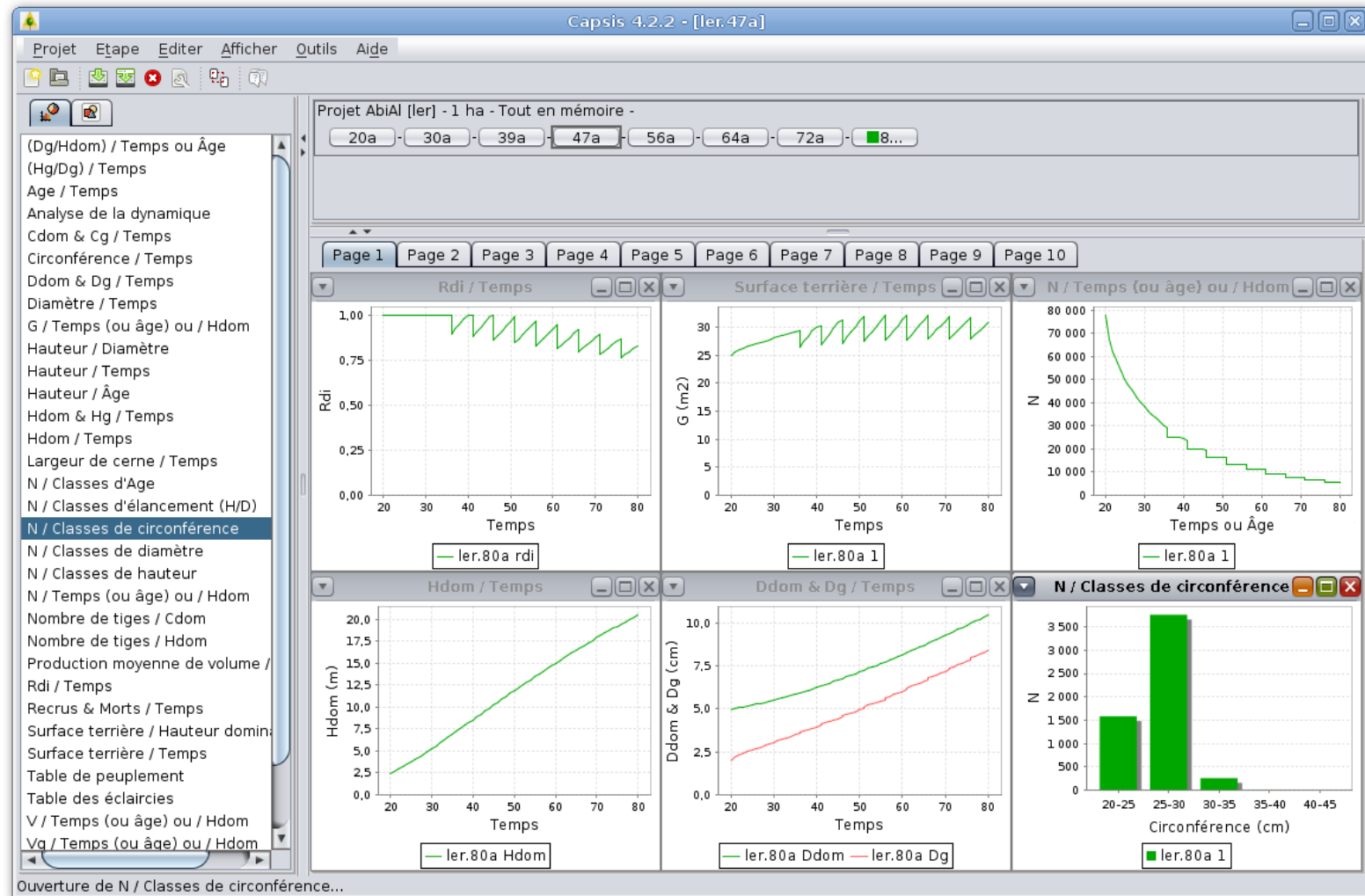
CAQ 14 - Capsis 13 - Avignon - 4-6 avril 2011

INRA - UMR AMAP  
botAnique et bioinforMatique de l'Architecture des Plantes

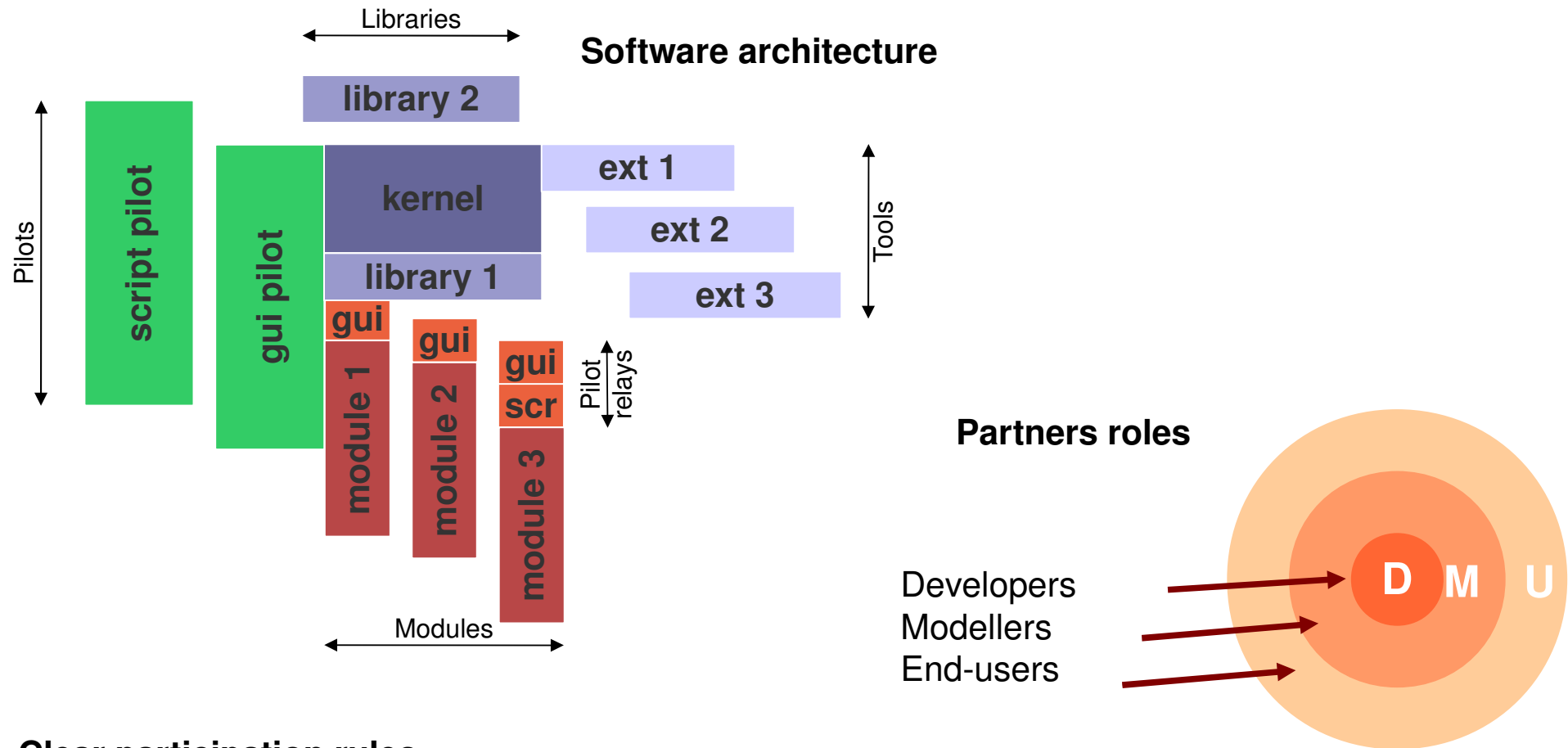


# La plateforme Capsis

Objectif : Construire une **plate-forme logicielle** pour **intégrer des modèles** de croissance et de dynamique forestière pour les **modélisateurs, gestionnaires forestiers et l'enseignement**



# Projet Capsis - Organisation



## Clear participation rules

- **The common part is free (LGPL): green / blue parts**
- **The capsis charter rules (extract)**

Modellers develop themselves their modules

The modules belong to their authors (orange / red parts),

The source codes are shared within the community...

The Capsis community:  
Developers + Modellers **co-develop**  
together

## Nouveaux projets

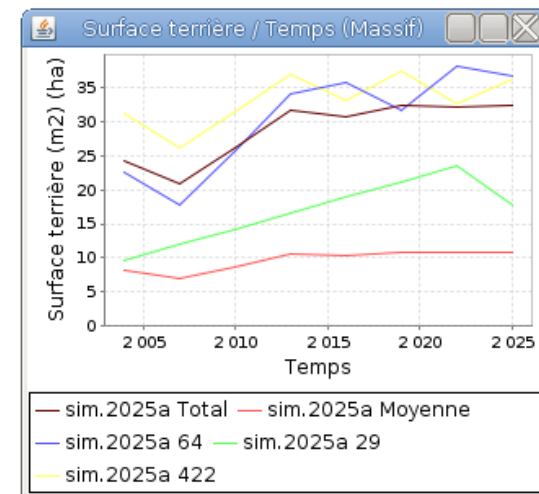
**PhysioDemoGenetics**  - *S. Oddou Muratorio, H. Davi* (INRA URFM, Avignon)

Etude de l'adaptation génétique au travers de la sélection conduite par des variables climatiques dans une population d'arbres

**Simmem**  - *P. Vallet, V. Cucchi* (Cemagref Nogent sur Vernisson)

Un modèle de niveau massif qui gère plusieurs forêts avec des modèles déjà intégrés dans Capsis ou bien intégrés dans le cadre du projet (régions d'Orléans et du Vercors / projet ANR Forgeco)

Simmem



**Douglas**  - *G. Ligot, J. Perin, A. de Pierpont* (Université de Liège Gembloux Agro-Bio Tech, Belgique)

Un modèle arbre indépendant des distances pour des peuplements équiennes de Douglas (*Pseudotsuga menziensis*)

**Abccedrus** - *E. Klein, F. Guiton, M. Haddad* (INRA-BioSP, Avignon)

Développement d'un modèle de colonisation pour le Cèdre sur le Mont-Ventoux pour analyser des données génétiques et démographiques par une méthode ABC

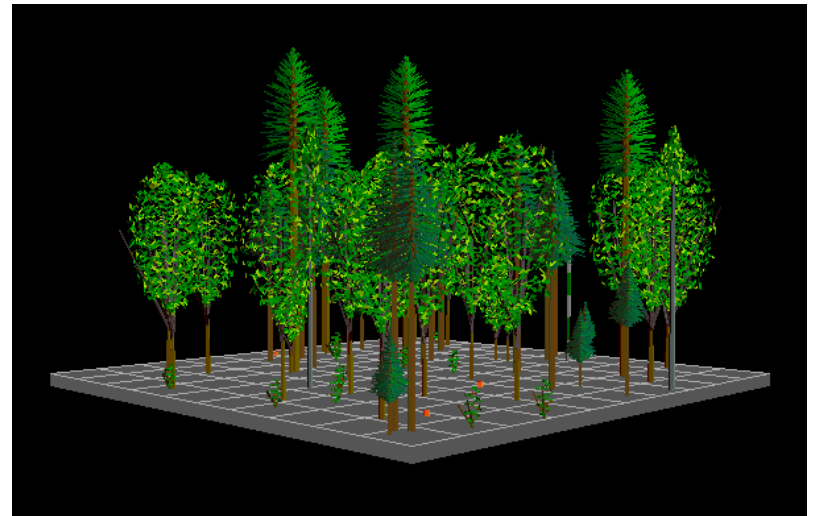
## Projets actifs 1...

**Sylvogène** ★ - *C. Meredieu, T. Labbé* (INRA Biogeco, Bordeaux), *A. Colin* (IFN Nogent sur Vernisson)

Calcul de l'état de la ressource en Pin Maritime en Aquitaine, mise à jour pour les inventaires annuels de l'IFN et pour répondre à une sollicitation du ministère concernant l'état de la ressource du massif landais, travail fait en partenariat avec l'IFN

**FireParadox** ★ - *F. Pimont, E. Rigolot* (INRA URFM, Avignon), *R. Parsons, K. Doyle* (Missoula Fire Sciences Laboratory, USA),

Chargement de données provenant de Stand Visualization System (USDA), visite de Russel Parsons à Avignon, intégration d'un modèle de dispersion d'insectes, autres collaborations prévues



SVS - USDA Forest Service, Pacific Northwest Research Station

## Projets actifs 2...

**Bidasoa** - *J. Labonne* (INRA UMR ECOBIOP, Saint Pée sur Nivelle), *A. Caudron*, *J. Gil* (INRA CARRTEL, Thonon les Bains)  
Dynamique et génétique de poissons (*Salmo trutta*) dans la rivière Bidasoa, adaptation aux problématiques de Thonon

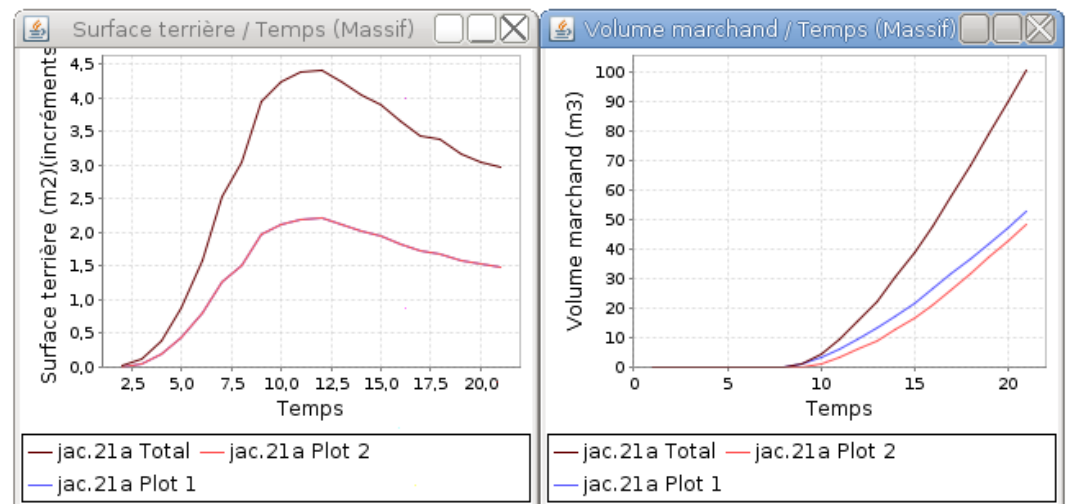
**Stretch** - *G. Vincent* (IRD AMAP)

Modèle individu centré destiné à la simulation de peuplements forestiers tropicaux, discrétisation des houppiers par triangulation dynamique, remise à plat des fonctions de réponse h-dbh à l'environnement local

**Jackpine** - *R. Schneider* (UQAR, Québec), *V.C. Goudiaby*, *E. Beaulieu*, *R. Audet*, *F. Berninger* (UQAM Québec)

Croissance du Pin gris (ou autres espèces) au Canada avec le modèle Crobas - PipeQual d'Annikki Makela (University of Helsinki, Finland), adaptation au niveau massif : plurispécifique

Jackpine



## Projets actifs 3...

**Artemis**  - *M. Fortin* (INRA Lerfob)

Un modèle arbre indépendant des distances pour les principales végétations potentielles de la province de Québec, CANADA. (+ Succès, Matapedia...)

**Samsara / Samsara2**  - *B. Courbaud, V. Lafond* (Cemagref, Grenoble)

Un modèle arbre spatialement explicite pour plusieurs espèces de montagne (Epicea, Sapin, feuillus...)

**Ventoux**  - *P. Dreyfus* (INRA URFM)

Nouveau module, dérivé de Ventoux, facilitant notamment la mise au point d'itinéraires sylvicoles pour le "Guide des Sylvicultures de Montagne pour les Alpes du Sud françaises" (ONF-Cemagref-INRA, 2011, sous presse).

**Lubéron** - *M. Alleaume, F. Courbet, F. Lefèvre* (INRA URFM, Avignon)

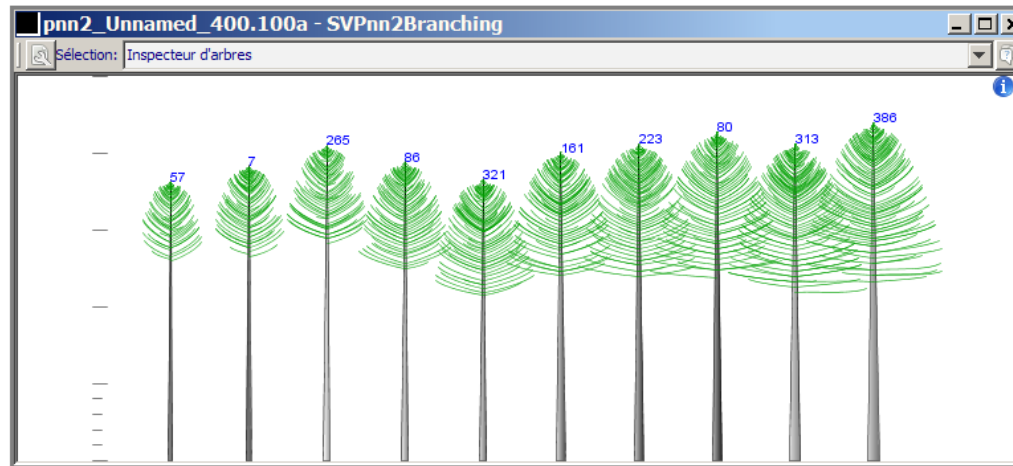
Un modèle arbre indépendant des distances avec génétique pour le Cèdre de l'atlantique, bords réfléchissants pour les graines, activation de la mortalité liée à la compétition

## Projets actifs 4



### **Pnn2** - *P. Dreyfus* (INRA URFM)

Intégration d'un modèle de branchaison, d'une visualisation simple des branches (axe principal, sans ramification), format export pour connexion avec GreenLab (cf. thèse Lu Feng, exposé D.Auclair et al. le 5/4)



### **Migration** - *A. Amm* (INRA URFM)

Améliorations, puis simulations de la migration du Sapin et de la mortalité massive en contexte de changement climatique (différents degrés de réchauffement) - thèse d'Annabelle Amm "Contribution à l'estimation des potentialités de migration des essences forestières face au changement climatique : Le cas du sapin pectiné (*Abies alba* Miller) sur le Mont Ventoux." soutenue le 25 mars 2011

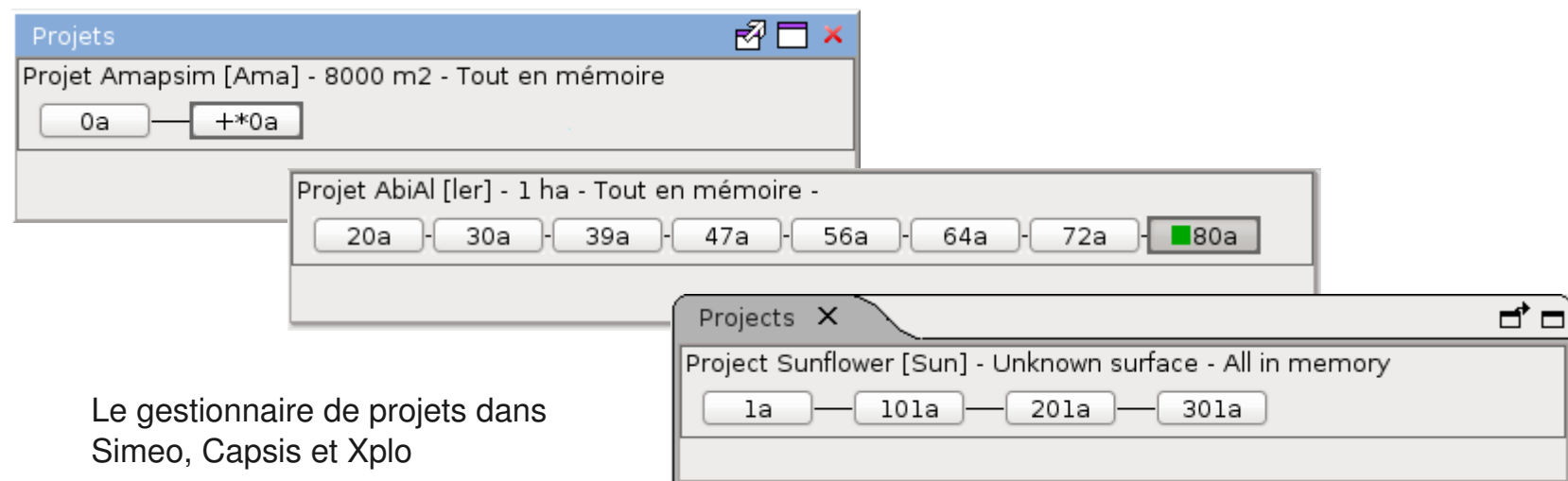


## Relecture / réorganisation du noyau Capsis

Relecture complète l'automne dernier

- Mise à jour des commentaires
- Clarification, plus générique
- Processus de démarrage plus clair
- Les scripts démarrent le pilote script de Capsis dans tous les cas
- Les options sont mieux gérées
- Les gestionnaires d'extensions des diverses bibliothèques / applications sont chaînables
- Un package capsis.commongui (commandes principales, gestionnaire de projet)
- Un package capsis.app contient ce qui est spécifique à l'application (démarrateur, gestionnaire d'extensions, classe script)
- Un package capsis.defaulttype pour les types domaine dépendants (Tree, TreeList...)

-> Le noyau Capsis devient multi-applications (utilisé par Capsis, Xplo et Simeo)



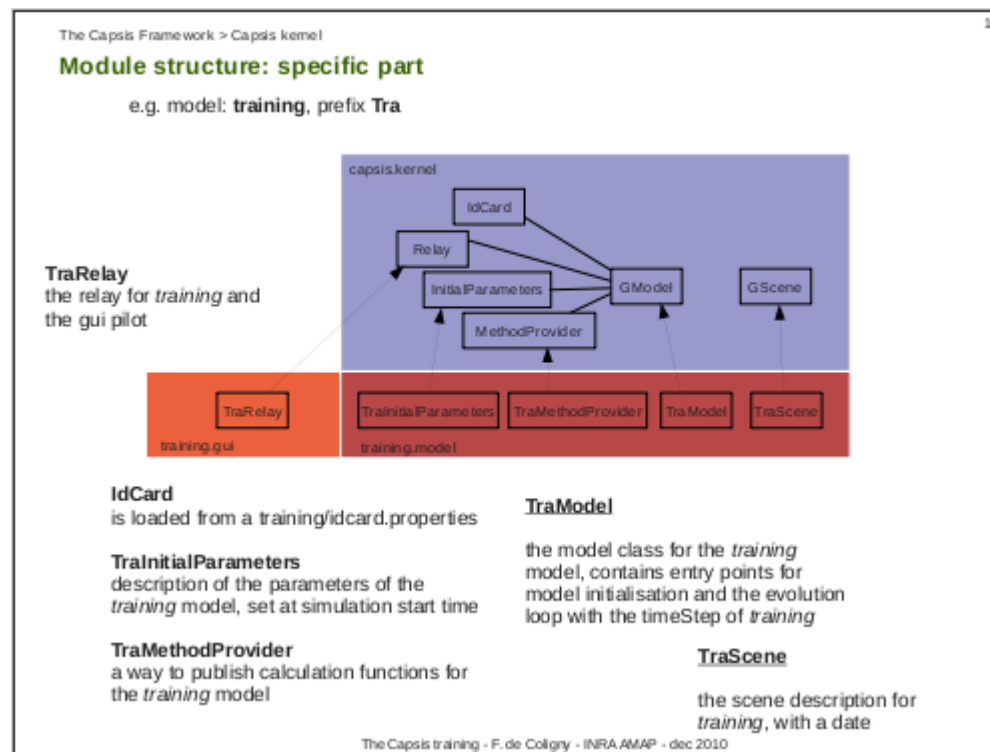
## Refonte de la formation Capsis (deux jours)

Fusion / réorganisation de la **formation Java** en 2 parties :

- Bases
- Programmation Orientée Objets

Réorganisation et mise à jour de la **formation Capsis**

- Introduction
- Le framework Capsis (supports réutilisables pour applications basées sur le noyau Capsis)
- Spécificités Capsis




# Amélioration de l'accompagnement au démarrage 1...

Après avoir suivi la formation Capsis, les modélisateurs se voient proposer une assistance au démarrage

- Création d'un squelette facilité par **ant createmodule**
- Le module template a été entièrement revu...


...pour un résultat plus propre et un démarrage plus rapide



```
/** The main class for __MODULENAME__.
 * It usually contains methods to create the initial scene in the project.
 * This can be done by loading a file or by specific generation methods.
 * It contains an initializeModel (InitialParameters p) method that is
 * run at project initialisation time. It also contains the main
 * processEvolution (Step s, EvolutionParameters p) method to calculate
 * the evolution of the scene over time, i.e. the growth or dynamics model.
 *
 * @author __AUTHOR__ - __DATE__
 */
public class TplModel extends GModel {

    // A way to get unique ids for the trees
    private TicketDispenser treeIdDispenser;

    /** Constructor
     */
    public TplModel () throws Exception {
        super ();
        treeIdDispenser = new TicketDispenser ();
        setSettings (new TplInitialParameters());
    }
```



```
/** The main class for Abccedrus.
 * It usually contains methods to create the initial scene in the project.
 * This can be done by loading a file or by specific generation methods.
 * It contains an initializeModel (InitialParameters p) method that is
 * run at project initialisation time. It also contains the main
 * processEvolution (Step s, EvolutionParameters p) method to calculate
 * the evolution of the scene over time, i.e. the growth or dynamics model.
 *
 * @author E. Klein, F. Guiton, M. Haddad - March 2011
 */
public class AbcModel extends GModel {

    // A way to get unique ids for the trees
    private TicketDispenser treeIdDispenser;
    private Random random;

    /** Constructor
     */
    public AbcModel () throws Exception {
        super ();
        treeIdDispenser = new TicketDispenser ();
        random = new Random (); // maybe with a specific seed: LATER

        setSettings (new AbcInitialParameters());
    }
```

## Amélioration de l'accompagnement au démarrage 2

## 2.1 Getting started

- **Who can join the Capsis project ?**
- **Developing in Capsis with SVN and Ant**
- Code Editor (Notepad++ / Scite / Eclipse)
- Amap-dev : development web site
- SVN update and commit
- Ant commands

## 2.2 Developing modules

- **How to add a new model in Capsis (part 1.)**
- **How to add a new model in Capsis (part 2.)**
- → **Development tips and tricks**
- Model architecture
- Automatic User interface
- Method provider
- Documentation des méthodes de calcul (fr)

## 2.3 Extensions

- The Capsis extensions [to be reviewed]
- Graphical extension Manager and compatibility tuning with vetoes
- **How to write an intervention tool**
- How to write a data extractor (legacy version)
- Data Extractors Configuration

## 2.4 Scripting

- Script mode
- 3 examples of scripts and how to run them
- Using the Groovy script language
- Automation
- Using scripts to perform optimisation

## 2.5 Distributing your model

La documentation en ligne a été enrichie pour ceux qui ne peuvent pas se déplacer à Montpellier

## C'est parfois le cas pour les **partenaires étrangers**

## How to add a new Model in Capsis (part 2.)

— this doc is still under progress - fc-29.3.2011 —

**Prerequisite**

This doc can be used to begin the integration of your model in Capsis. You must have read [the part 1](#) before.

## General introduction

To integrate a new model in Capsis, you have to add a new module. All modules have the same structure and can be run with the Capsis graphical user interface or in script mode without a user interface. The part I helped you build a skeleton module for your new module. This documentation will explain you the structure of this module and how you may modify it to implement your own growth model.

## Architecture of Capsis

Capsis is a generic software built around the Capsis kernel. This kernel contains the main classes of the software (organized in several packages, including `capsis.kernel`, `capsis.util`, `capsis.app...`). Further details regarding this kernel and the general architecture of Capsis may be found in the *Capsis training* and are not presented here.

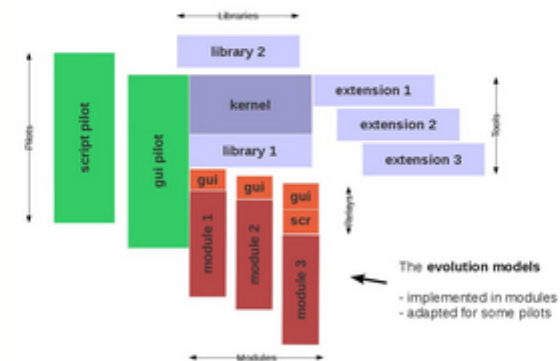


Fig. 1. The Capsis architecture

Figure 1. shows the Capsis kernel in **blue**. The Capsis modellers do not work in the Capsis kernel, nor in the **green** parts (the capsis pilots: main user interface, script pilot,...). They mainly work in the **red / orange** parts: the Capsis modules. Some of them may create extensions or libraries for particular purposes.

### Structure of a module

The structure of a module is represented in figure 2. The main classes of the module are in the red part. The Scene and Model classes are the most important ones (see lower for details). The orange part may contain additional classes if particular adaptations are needed for some pilots.

# Amélioration de la documentation en ligne 1...

## Documentation **Who can join ?**

Pour aider les lecteurs intéressés à **bien comprendre** l'approche Capsis, l'investissement nécessaire et le retour sur investissement

### Who can join the Capsis project ?

The Capsis platform can host various types of forestry growth and yield / forest dynamics models. The core part of the platform is free to make it easy for partners to join Capsis.

Any interested scientist can contact the Capsis team to become a Capsis modeller in accordance with the [Capsis charter](#). This implies that the scientist will be helped to become a beginner developer to be able to do the integration job by himself with simple tools, with support at the beginning and then when he needs help.

The Capsis developers are skilled in software development and not in modelling. The help will concern the integration of the forestry model within the Capsis software and not the forestry model development by itself.

### Where do I start ?

First, you can discuss your project [with us](#) by mail to ensure the integration is possible and that it will be profitable for you. After that, if you decide to join Capsis, you have to accept the [Capsis charter](#).

Then the usual way is to meet us in Montpellier for an initial training session, followed by a starting stage together to begin build your project within Capsis. This can take more or less 5 days for the whole, possibly in 2 separate sessions (e.g. 2 + 3 days). It can also possibly be 2 weeks in one single session if you come from abroad.

Another possibility is to contact us and do the job by yourself without meeting us, if you feel enough skilled in java programming to do it with only help by mail. This option is not very developed at present time (all scientist are not supposed to be skilled developers) but we would like to make it easier in the future (some scientist may feel at ease with developing). See [how to add a new model in Capsis](#)

Anyway, feel free to [contact](#) us for any question 😊

### Where is the documentation ?

You will find many documentation on the Capsis web site, particularly on the [Documentation page](#). We intend to swith completely to english as working language so the new docs are directly written in english.

Documentation shortcuts :

- The "Capsis4 reference documentation" (v1.1, sep 2001, still in french, still valid) :  pdf
- A general purpose presentation about Capsis :  pdf

Table of Contents
<ul style="list-style-type: none"><li>· Who can join the Capsis project ?</li><li>· Where do I start ?</li><li>· Where is the documentation ?</li></ul>

# Amélioration de la documentation en ligne 2...

**FAQ** : écriture d'un paragraphe pour chaque questions récurrentes

## Frequently Asked Questions

### General

#### How to join the Capsis project ?

See the [related documentation](#).

#### What is the license of Capsis ?

Capsis4 is distributed under the [LGPL license](#) (see the license file in the Capsis distribution). The Capsis4 modules are distributed with custom licenses, see the license file in each module directory (ex: capsis4/bin/mountain/).

### Technical basics

#### How do I type the commands under Windows ?

You need to open a terminal (also called a console or a shell under Unix).

- You may try **Start > Execute** and type `cmd`.
- You may alternatively find the terminal in **Start > Programs > Accessories**.

While in the terminal, you can change volumes by typing the volume name (e.g. C: or D:) and you can navigate through the directories with the `cd` (change directory) command.

E.g. to go to the capsis install directory (replace the directory names according to your installation path):

```
C:
cd \capsis
```

All ant commands must be typed from the install directory like the following example (to force the recompilation of all sources):

```
ant clean compile
```

Note: this command should finish with this message: BUILD SUCCESSFUL.

#### How do I type the commands under Linux ?

You need to open a terminal (also called a console or a shell).

E.g. under Linux Ubuntu, you may try **Application > Accessories > Terminal**.

While in the terminal, you can navigate through the directories with the `cd` (change directory) command.

E.g. to go to the capsis install directory (replace the directory names according to your installation path):

```
cd /home/coligny/workspace/capsis
```

### Table of Contents

- Frequently Asked Questions
  - General
    - How to join the Capsis project ?
    - What is the license of Capsis ?
  - Technical basics
    - How do I type the commands under Windows ?
    - How do I type the commands under Linux ?
    - How do I type the commands under Mac OS X ?
  - Java installation
    - Which version of Java must be installed ?
    - Do I have to install the whole JDK or is the JRE sufficient ?
    - Where can I download Java ?
    - Several vendors provide versions of Java, how can I choose ?
    - Which environment variables must I set to use Capsis ?
    - How can I check if Java is well installed on my machine ?
    - When compiling on my Mac OS X 10.5, I have a 'bad class file... wrong version 50.0, should be 49.0'
  - Capsis installation
    - The Capsis archive has been built under Linux, how can I unzip it under Windows ? (Zip version installer)
    - Where must I install Capsis (Zip version installer)
  - How to use Capsis
    - Ok, I've installed it, How does it work ?
    - What models are available in my version of Capsis ?
    - How can I open a viewer or a graphical output on a given step ?
    - How to use a viewer simultaneously on two steps ?
    - The project Manager (or the Selector, or the main Toolbar) have disappeared, how to make them come back ?
    - Where is the log file ?
    - How can I launch my JUnit test ?
    - How can I ensure my tests are run periodically ?

# Amélioration de la documentation en ligne 3...

## Documentations techniques pour autonomiser les modélisateurs

### How to write an intervention tool

An intervention tool (intervener) applies a process on a scene and returns a modified scene. The new scene is connected to a new step linked after the original step in the project.

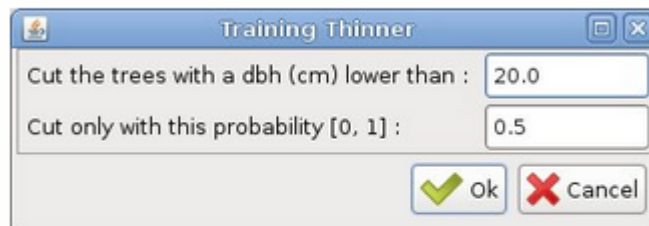
In forestry, the usual intervention is thinning: "cut trees in the scene". However, it is possible to implement all kinds of interventions, e.g. replanting, fertilization, effect of the wind...

#### Table of Contents

- How to write an intervention tool
- A simple example: the Training Thinner
- Step by step detailed comments
- The complete source code of the intervener

### A simple example: the Training Thinner

This intervener cuts the trees with a diameter lower than a given value with a given probability.



**Reminder:** an entry must be added in the etc/extension.list of Capsis otherwise the extension will not be found by the ExtensionManager.

```
...
training.extension.intervener.TraThinner=enabled
training.extension.intervener.TraThinner%subType=SelectiveThinner
...
```

### Step by step detailed comments

The code of this very simple thinner is presented in commented blocks below. The complete code can be found at the bottom of this document in case you would like to copy it to make a new intervener.

```
package training.extension.intervener;

import java.util.Collection;
import java.util.Iterator;
import java.util.List;
import java.util.Random;

import jeeb.lib.util.Log;
import jeeb.lib.util.Translator;
import jeeb.lib.util.annotation.Ignore;
import jeeb.lib.util.autoui.SimpleAutoDialog;
import jeeb.lib.util.autoui.annotations.AutoUI;
import jeeb.lib.util.autoui.annotations.Editor;
import training.model.TraModel;
import capsis.defaulttype.Tree;
import capsis.defaulttype.Treelist;
```



## Amélioration de la documentation en ligne 4...

La **javadoc** du projet est disponible en ligne (mise à jour automatique mensuelle)

[Home](#) [My page](#) [Projects](#) [Administration](#) [Help](#) Logged in as coligny [My account](#) [Sign out](#)

# Capsis

Search:  Capsis ▼

[Overview](#) [Activity](#) [Roadmap](#) [Issues](#) [New issue](#) [News](#) [Wiki](#) [Files](#) [Repository](#) **[Javadoc/Junit](#)** [Hudson](#) [Settings](#)

[Overview](#) [Package](#) [Class](#) **[Tree](#)** [Deprecated](#) [Index](#) [Help](#)

### Packages

<a href="#">abccedrus.extension.standviewer</a>	
<a href="#">abccedrus.gui</a>	
<a href="#">abccedrus.model</a>	
<a href="#">abccedrus.myscripts</a>	
<a href="#">afocelpa.gui</a>	
<a href="#">afocelpa.model</a>	
<a href="#">afocelpp.gui</a>	
<a href="#">afocelpp.model</a>	
<a href="#">alisier.extension.ioformat</a>	
<a href="#">alisier.gui</a>	
<a href="#">alisier.model</a>	
<a href="#">amapsim.extension.ioformat</a>	
<a href="#">amapsim.gui</a>	
<a href="#">amapsim.model</a>	
<a href="#">artemis.extension.ioformat</a>	
<a href="#">artemis.gui</a>	
<a href="#">artemis.model</a>	
<a href="#">bidasoa.extension.dataextractor</a>	
<a href="#">bidasoa.extension.intervener</a>	



## Amélioration de la documentation en ligne 5

Les derniers **résultats des tests** sont disponibles en ligne (mis à jours à chaque svn commit)

[Home](#) [My page](#) [Projects](#) [Administration](#) [Help](#) Logged in as [coligny](#) [My account](#) [Sign out](#)

# Capsis

Search:  Capsis ▼

[Overview](#) [Activity](#) [Roadmap](#) [Issues](#) [New issue](#) [News](#) [Wiki](#) [Files](#) [Repository](#) [Javadoc/Junit](#) [Hudson](#) [Settings](#)

## Unit Test Results.

Designed for use with [JUnit](#) and [Ant](#).

---

### Summary

Tests	Failures	Errors	Success rate	Time
83	2	6	90.36%	292.473

Note: *failures* are anticipated and checked for with assertions while *errors* are unanticipated.

---

### Packages

Note: package statistics are not computed recursively, they only sum up all of its testsuites numbers.

Name	Tests	Errors	Failures	Time(s)	Time Stamp	Host
<a href="#">artemis.test</a>	3	0	1	177.123	2011-04-01T08:19:44	tilleul
<a href="#">capsis</a>	1	0	0	0.078	2011-04-01T08:22:42	tilleul
<a href="#">capsis.extension.generictool.assistant</a>	3	0	0	0.079	2011-04-01T08:22:42	tilleul
<a href="#">capsis.extension.modeltool.carbonstorageinra</a>	1	0	0	2.276	2011-04-01T08:22:45	tilleul
<a href="#">capsis.extension.treelogger.geolog</a>	1	0	0	1.138	2011-04-01T08:22:49	tilleul
<a href="#">capsis.kernel</a>	20	3	0	1.758	2011-04-01T08:22:51	tilleul
<a href="#">capsis.kernel.automation</a>	4	0	0	0.075	2011-04-01T08:22:58	tilleul
<a href="#">capsis.kernel.extensionmanager</a>	1	0	0	0.499	2011-04-01T08:22:58	tilleul
<a href="#">capsis.lib.math.data</a>	4	0	0	0.597	2011-04-	tilleul

## Un article en cours de rédaction

Soumis à Annals of Forest Science

-> pourrait constituer l'article de référence Capsis

### **Capsis: an open software framework and community for forest growth modelling**

Samuel Dufour-Kowalski, Benoît Courbaud, Philippe Dreyfus, Céline Meredieu, François de Coligny

#### 25 **Abstract**

26 Forest scientists build models to simulate stand growth and forests dynamics. Dedicated  
27 computer tools are often developed to implement these models to run silvicultural scenarios and  
28 explore simulation results. In this paper, we present the Capsis framework and methodology  
29 which aims at simplifying the implementation, integration, simulation and comparison of forest  
30 models. Capsis provides an open and modular software architecture based on various

## Quelques points spécifiques 1...



La méthode de packaging par IzPack fonctionne bien, les modélisateurs s'en servent pour distribuer leurs modèles (partenaires, formations...)

Un grand nombre de bibliothèques (capsis4/ext/\*.jar) sont livrés avec Capsis, notamment commons-math d'Apache qui semble appréciée  
<http://commons.apache.org/math/index.html>

commons  
[Math]

### Commons-Math: The Apache Commons Mathematics Library

Commons Math is a library of lightweight, self-contained mathematics and statistics components addressing the most common problems not available in the Java programming language or Commons Lang.

Guiding principles:

1. Real-world application use cases determine development priority.
2. This package emphasizes small, easily integrated components rather than large libraries with complex dependencies and configurations.
3. All algorithms are fully documented and follow generally accepted best practices.
4. In situations where multiple standard algorithms exist, a Strategy pattern is used to support multiple implementations.
5. Limited dependencies. No external dependencies beyond Commons components and the core Java platform (at least Java 1.3 up to version 1.2 of the library, at least Java 5 starting with version 2.0 of the library).

## Quelques points spécifiques 2

Les scripts Capsis peuvent être lancés

- par **capsis - p script**
- ou par une méthode **main(String[] args)**

Toutes les possibilités sont listées dans la documentation sur les scripts

```
package maddmodule.myscripts;

import maddmodule.model.MaddEvolutionParameters;
import maddmodule.model.MaddInitialParameters;
import capsis.app.C4Script;
import capsis.kernel.Engine;
import capsis.kernel.Step;

/**
 * A Capsis script, type 1 (preferred):
 * (a) extends nothing particular,
 * (b) with a main method (can be launched directly with java),
 * (c) uses an instance of C4Script.
 *
 * Two ways to launch it:
 * (1) sh capsis.sh -p script maddmodule.myscripts.SimpleScript
 * (2) java -cp class:ext/* maddmodule.myscripts.SimpleScript
 *
 * @author F. de Coligny - 16.9.2010
 */
public class SimpleScript {
    public static void main(String[] args) throws Exception {
        C4Script s = new C4Script("maddmodule");
        MaddInitialParameters i = new MaddInitialParameters (s.getDataDir() + "/" +
        // init
        s.init(i);
        // evolution
        Step result = s.evolve(new MaddEvolutionParameters (200));
        // save
        Engine.getInstance ().processSaveAsProject (s.getProject(),
        s.getRootDir() + "/tmp/TEST.PRJ");
    }
}
```

# Applications soeurs : Xplo - a software for plant architecture eXploration

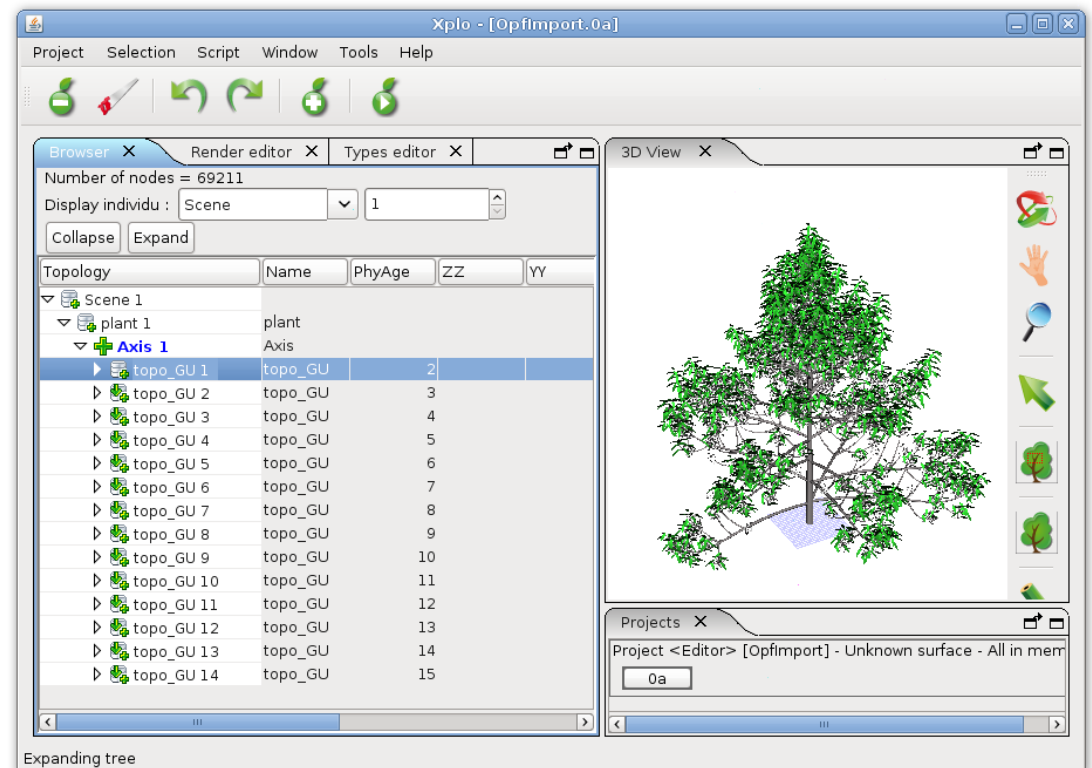
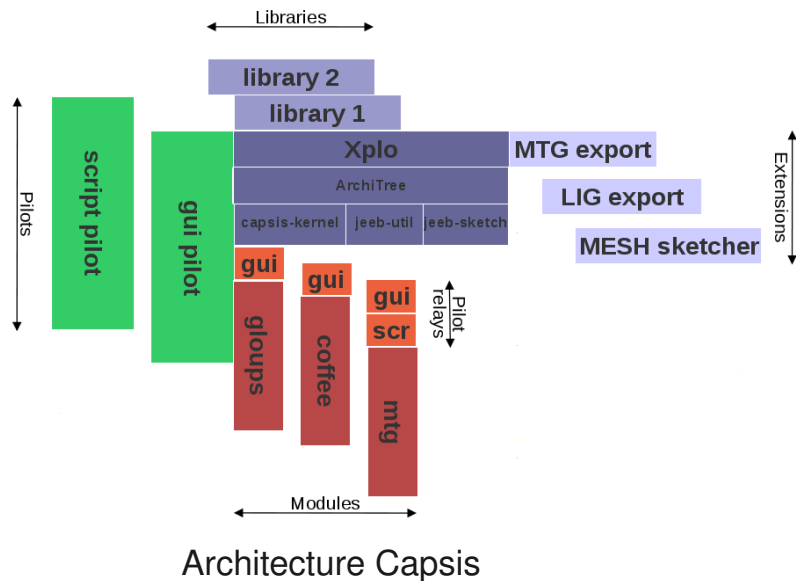
## Objectifs :

Un logiciel pour l'exploration de l'architecture des plantes

Construire, éditer, visualiser et filtrer les propriétés architecturales de la plante

Héberger des modèles de simulation

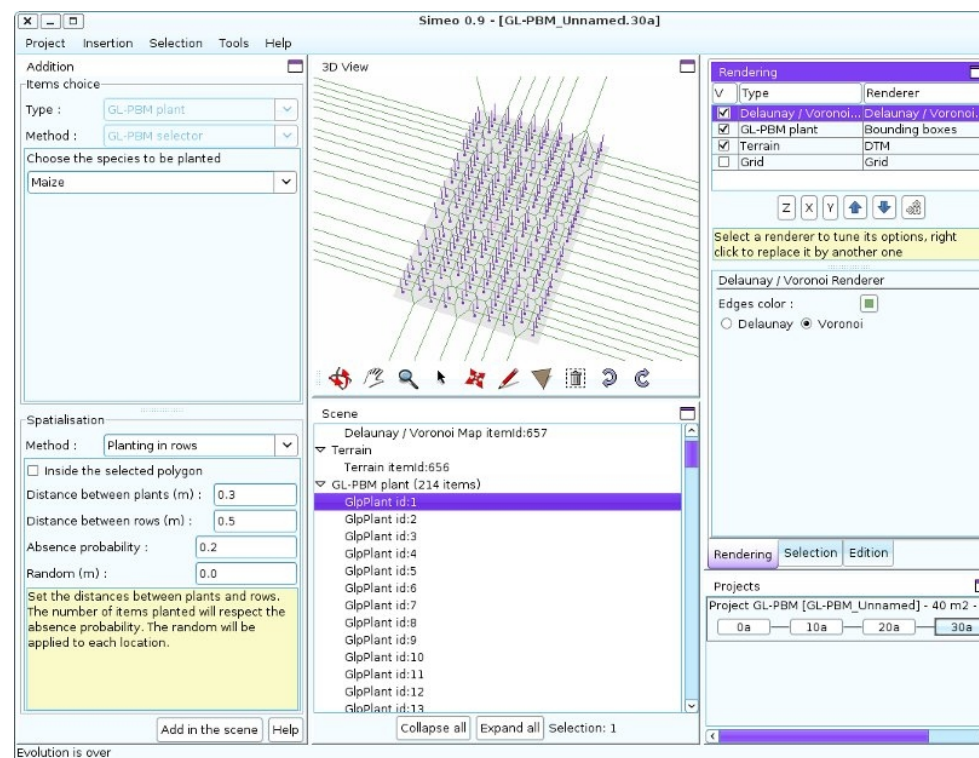
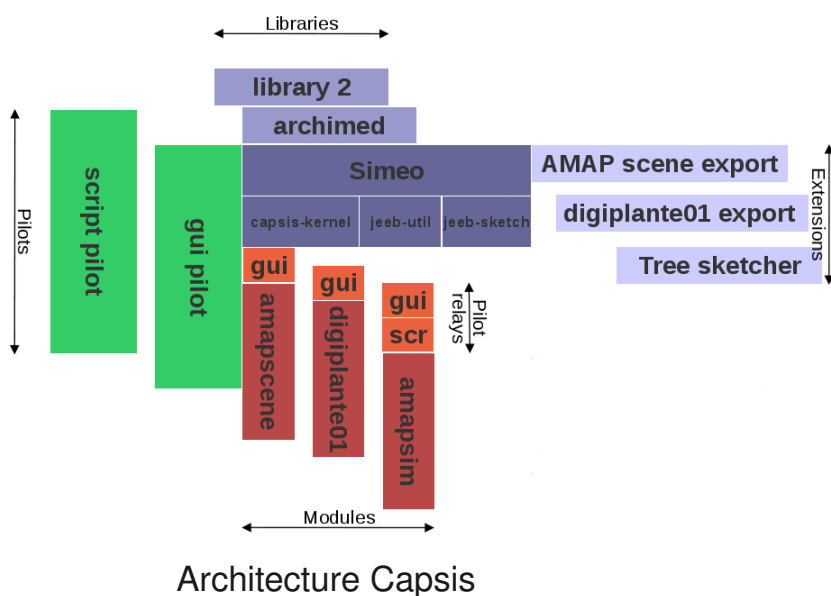
Responsable : S. Griffon (Cirad AMAP)



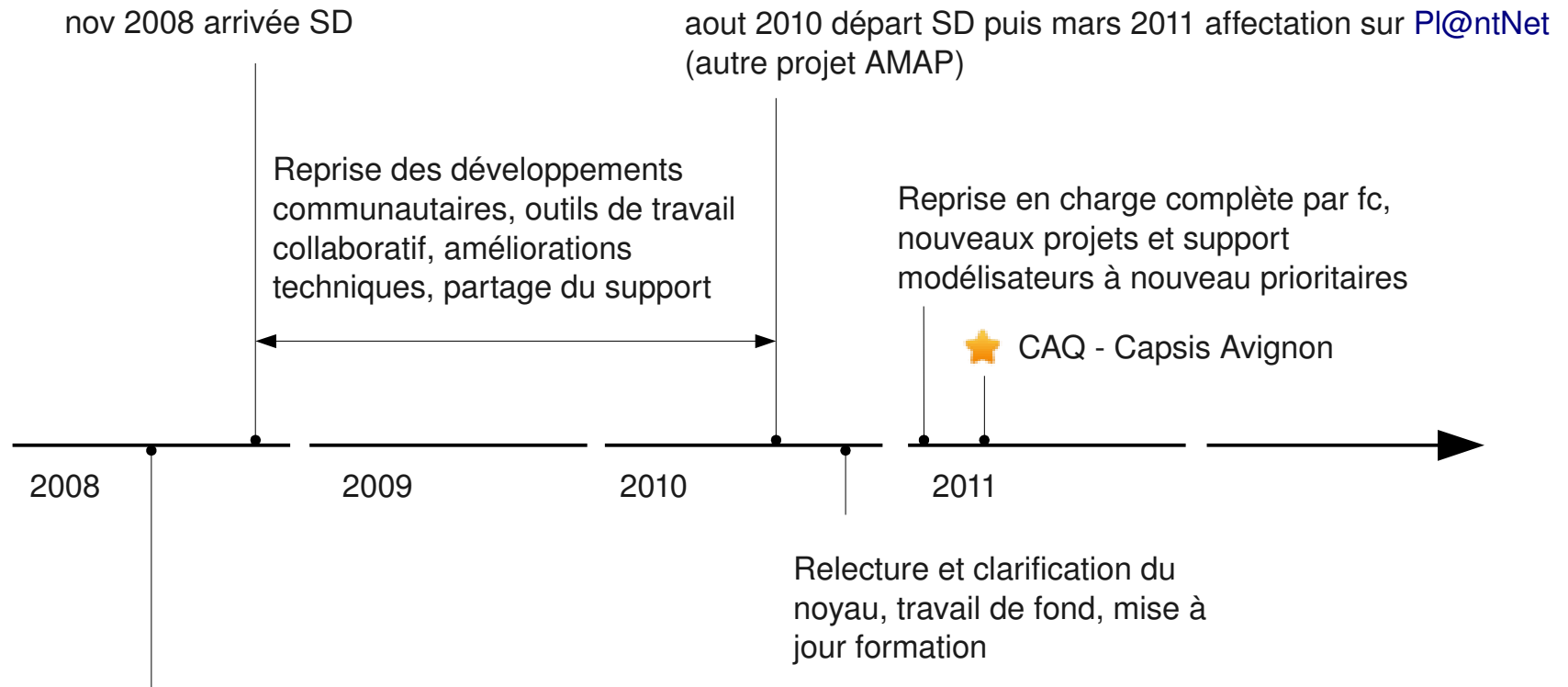
# Applications soeurs : Simeo - un éditeur de scène 3D végétale multi-usages

## Objectifs :

- Créer des scènes 3D végétales
- Faire des traitements sur la scène
- Connecter / exporter vers d'autres logiciels
- Héberger des modèles de simulation
- Responsable : F. de Coligny (INRA AMAP)



# Organisation des développements



## 2007 et 2008 – Trop de charge

Priorisation des projets  
Abandon développements pour la communauté  
Baisse de qualité

-> Demande d'un AI sur Capsis pour prendre en charge le **support quotidien**  
-> fc ainsi libéré en partie pourrait se concentrer sur le **communautaire**, la **conception**, prendre du **recul** pour voir les améliorations à apporter et s'impliquer dans d'**autres projets**, dont Simeo qui est sous-investi