The PALOMA Eclipse Plug-in User Manual

Cheng Feng

April 28, 2015

Contents

1 Installation Instructions

First, download a copy of the Eclipse platform with Xtext features from `http://eclipse.org/Xtext/download.html`. Once you have Eclipse and Xtext features downloaded, then, open the Eclipse IDE, choose *Help* → *Install New Software* (see Figure 1).

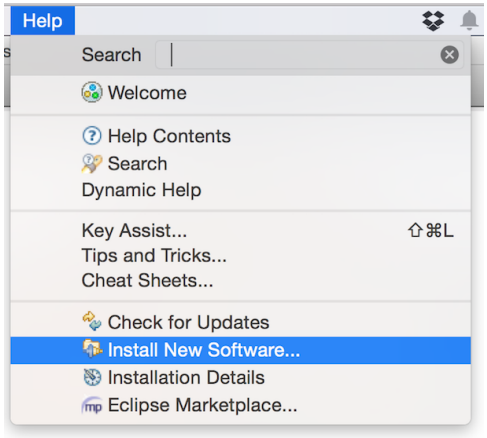

Figure 1: Install New Software

The wizard dialogue box that pops up will assist you through the installation process. Click on the *Add* button at the upper right hand side of the window and add the following update site (see Figure 2):

- PALOMA — `http://groups.inf.ed.ac.uk/paloma/palomaUpdateSite/`

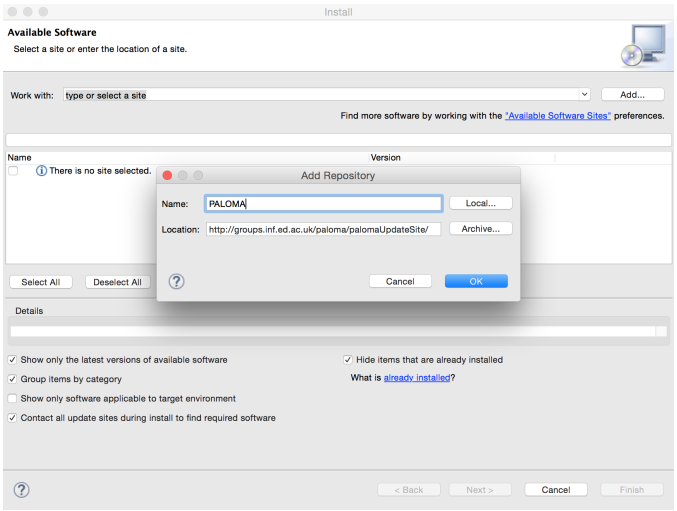

Figure 2: Adding a Repository in the Eclipse workbench

Then, select the *PALOMA SDK feature* as shown in Figure 3. Then click on *Next*.

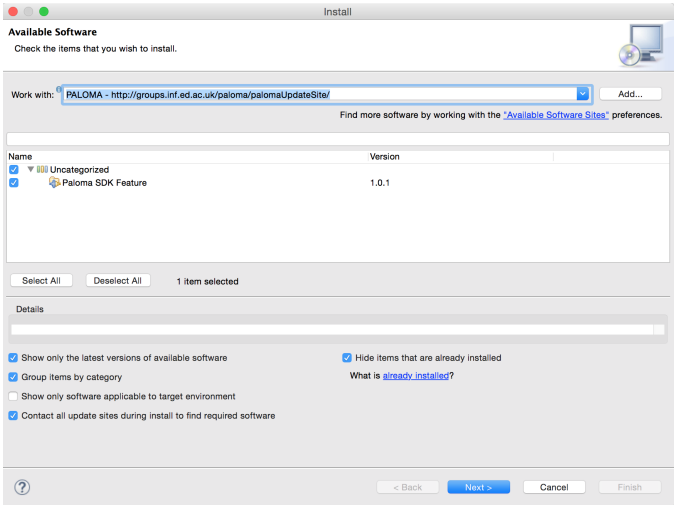

Figure 3: Select the PALOMA SDK feature

Eclipse will determine what plug-ins are required and then display the results (see Figure 4). Click *Next*.

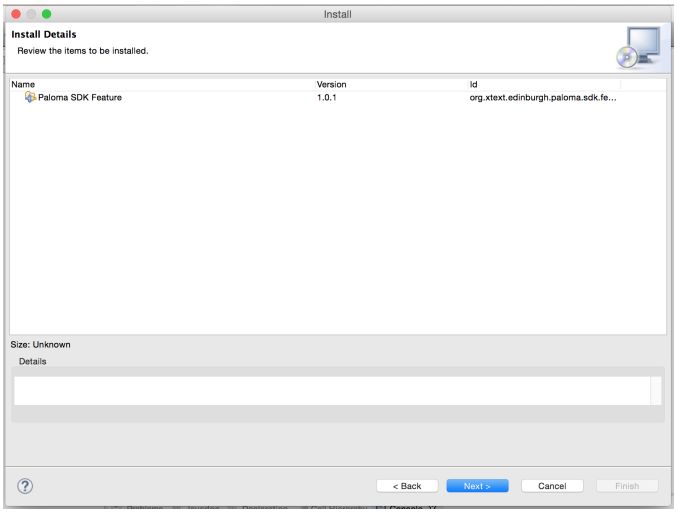

Figure 4: Review items to be installed

Then, accept the terms of the licence agreement before clicking on *Finish* (see Figure 5).

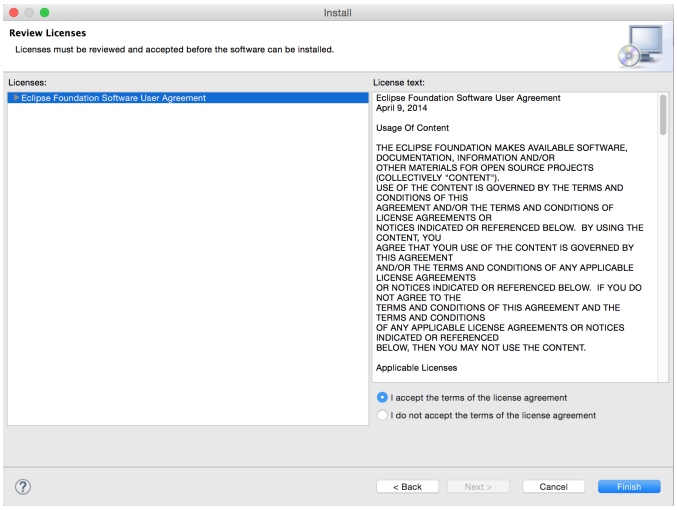

Figure 5: Review licenses

2 Creating a New Project

From the File menu choose *New* → *Project*. This will launch the New Project wizard and you should choose *General* → *Project* to create a new project where you will store your PALOMA models. Choose *Next* and give your project a name such as PALOMA-Examples. Choose *Finish*. You now have a project which you can see in the Navigator view.

Choose *File* → *New* → *Other* and then choose *General* → *File*. Press *Next*. Choose the parent folder to be the folder which contains the project which you just created. Choose a file name for your new file which ends in *.paloma* (for example, *example.paloma*). Press *Finish*. You now should see that the file is opened in the editor and that the Problems view reports a problem with the file because it is an empty file, and does not contain any PALOMA definitions. To see what a PALOMA model looks like, please download the example model from `http://groups.inf.ed.ac.uk/paloma/example.paloma`.

3 Parse a PALOMA Model

To parse a PALOMA model, you simply need to get your mouse focus on the PALOMA file, there will be a *PALOMA* menu appearing on the Eclipse menu bar. Click the *PALOMA* menu, a drop-down command list will show up. Click the *parse* command, the model will be parsed and the parsing result will show on the console view (see Figure 6).

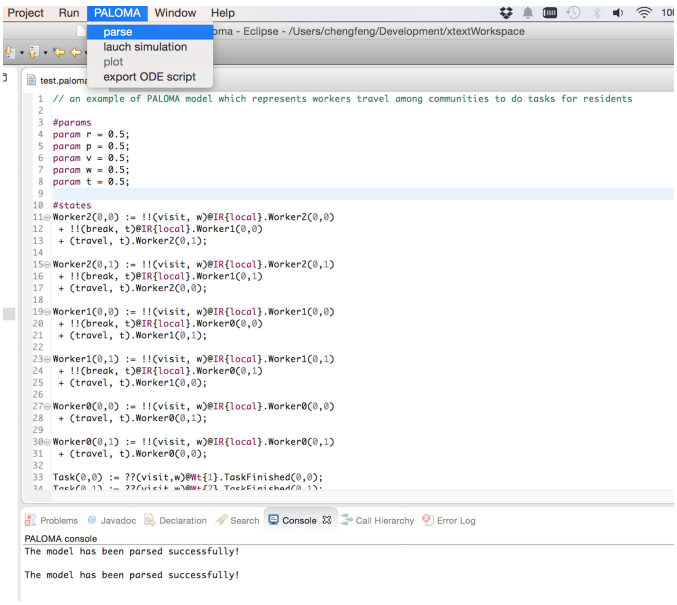

Figure 6: Parse a PALOMA model

4 Time-series Analysis

Once the model has been parsed successfully, you can do time-series analysis of your model which including stochastic simulation using Gillespie's algorithm and moment-closure approximation by exporting Matlab ODE scripts.

4.1 Performing stochastic simulation using PALOMA

To perform stochastic simulation, click the *launch simulation* command (see Figure 7).

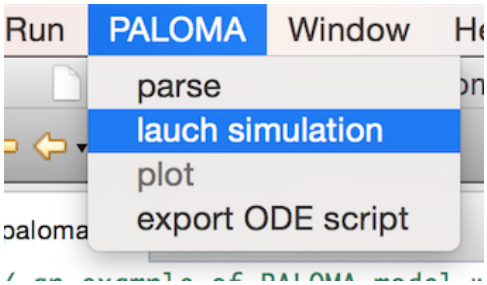

Figure 7: Launch simulation

Then, set the number of simulation runs and the time length of each run as shown in Figure 8, and click *start simulation*.

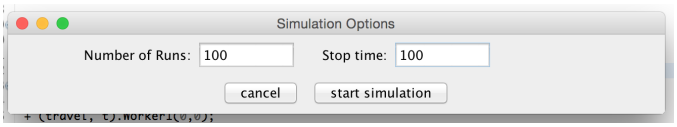

Figure 8: Simulation options

Once the simulation is finished, you can click the *plot* command under the *PALOMA* menu. Then, you just need to choose variables you want to plot, and click *plot* in the pop-up dialogue (see Figure 9).

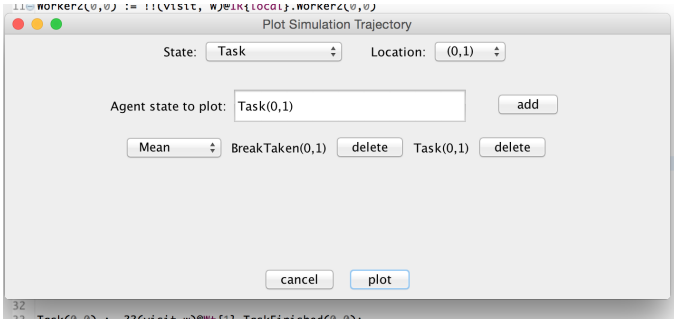

Figure 9: Choose variables to plot

The simulation result will be plotted in a pop-up graph, and you can save it as a .png file (see Figure 10).

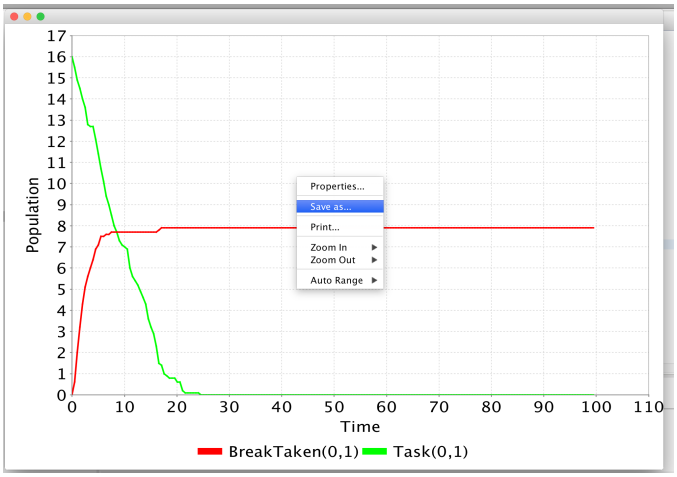

Figure 10: Plot result

4.2 Exporting Matlab Scripts for Moment-closure approximation

To export Matlab scripts for moment-closure approximation, you only need to click the *export ODE script* command under the *PALOMA* menu. Then, choose variables you want to investigate, and click *export* in the pop-up dialogue (see Figure 11).

Figure 11: ODE export options

You are also allowed to choose the directory to put the script files as shown in Figure 12.

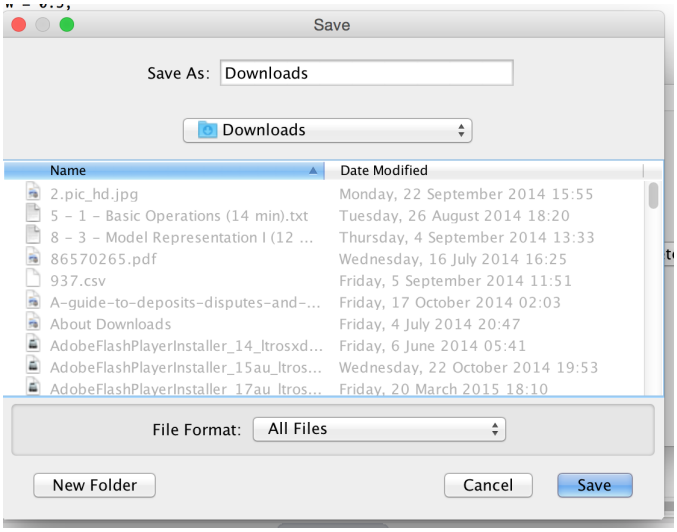

Figure 12: Plot result

The generated scripts are directly runnable in Matlab.