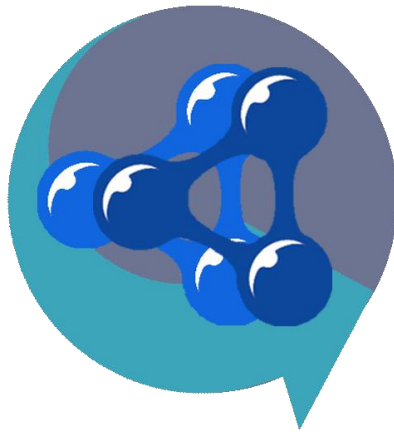


SemaDrift Manual

SemaDrift Protégé Plugin & SemaDriftFx



Official Site - <http://mklab.iti.gr/project/semadrift-measure-semantic-drift-ontologies>

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Links

MKLab – <http://mklab.iti.gr>

CERTH – <http://certh.gr>

ITI – <http://iti.gr>

The work has received funding by the project

Pericles FP7 – <http://pericles-project.eu>

1. SemaDrift metrics

SemaDrift calculates drift between ontologies and presents it in the form of a “stability” metric, i.e. a value from zero (no similarity) to one (full similarity).

The *Average Concept stability* constitutes the most generic, abstract measure of drift. It is a table with the average drift of all concepts from the former ontology to the latter, per each of the four aspects: *label*, *intension*, *extension* and *whole*.

Concept-per-Concept stability presents four tables, one for each aspect. Each table row corresponds to a concept of the former ontology and each column to a concept of the latter. Consequently, each cell holds the similarity metric (i.e. concept stability) between each pair of concepts. These similarity values between pairs can be further utilized by users for different purposes.

2. SemaDrift Protégé Plugin

This plugin offers integration with Protégé, the popular ontology creation software, providing a GUI to calculate drift. It leverages the Java SemaDrift Library to provide drift metrics for two consecutive ontology versions: one open in Protégé and a second ontology of choice. It requires Java 8 and a 4.* version of the Protégé application.

2.1. Installation

Step 1 - Install Java Runtime Environment 8 using this [link](#).

Step 2 - Download a 4.* version of the Protégé application, e.g. using this [link](#). **Do not** select an installer that includes a Java VM, because this may install an older version of the Java VM than the version required by SemaDrift.

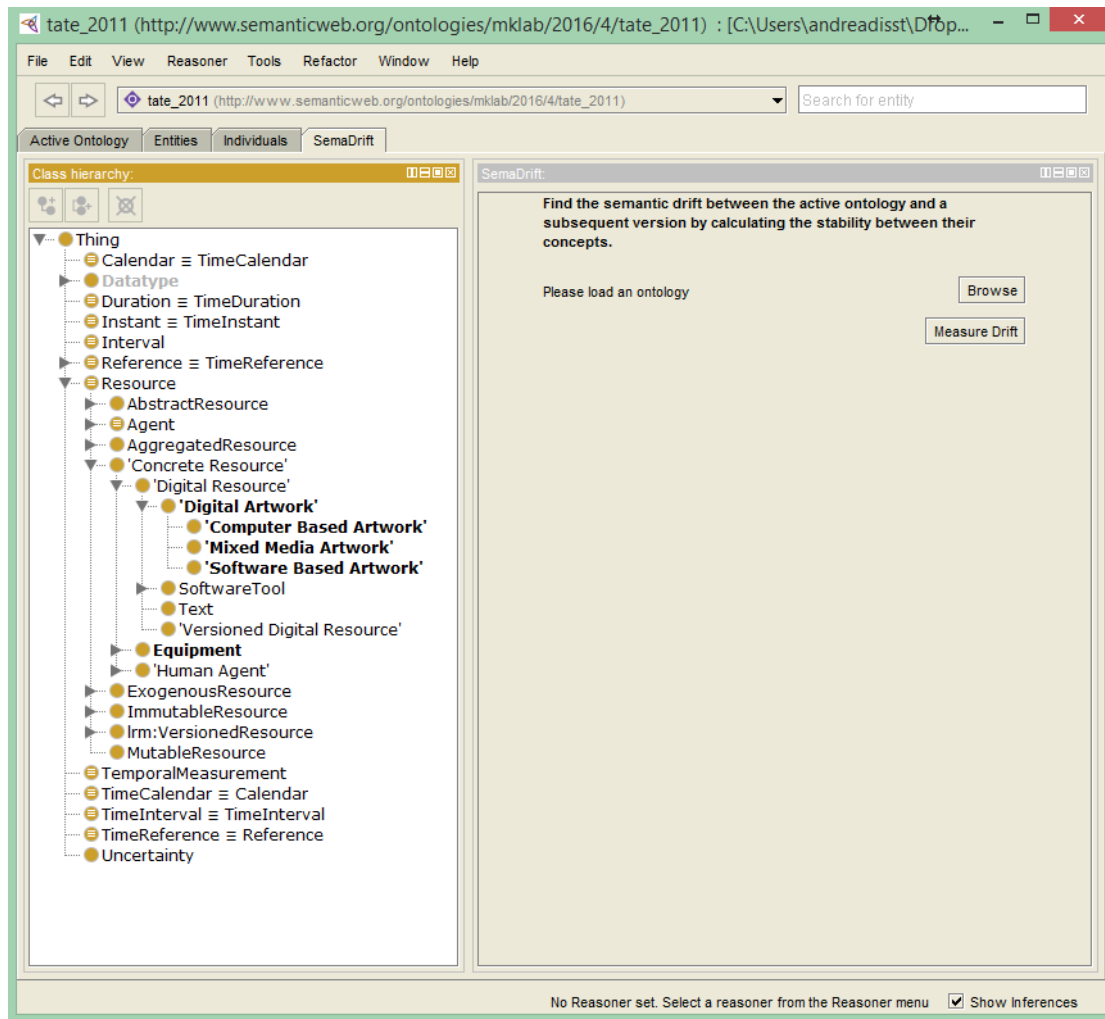
During installation, when you are asked to choose a Java Virtual Machine, specify the path to the Java downloaded in Step 1; in Windows, it should be something like `C:\Program Files\Java\jre1.8.0_112\bin\java.exe`.

Step 3 - After installation, Protégé will not be able to open because of Java 8. To overcome this problem, download a current version of felix.jar from felix.apache.org (Felix Framework Distribution) and replace the existing in the *bin* folder of Protégé (e.g. `C:\Program Files\Protege_4.3\bin\felix.jar`).

Step 4 - Download and extract the SemaDrift plugin using this [link](#).

Step 5 - Copy the .jar file to the *plugins* folder that resides within the installation folder of Protégé (e.g. `C:\Program Files\Protege_4.3\plugins`).

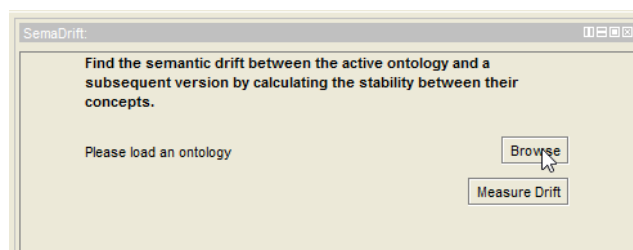
Step 6 - Start Protégé, go to menu *Window* → *Tabs* and select the SemaDrift tab. The new tab will look like this:



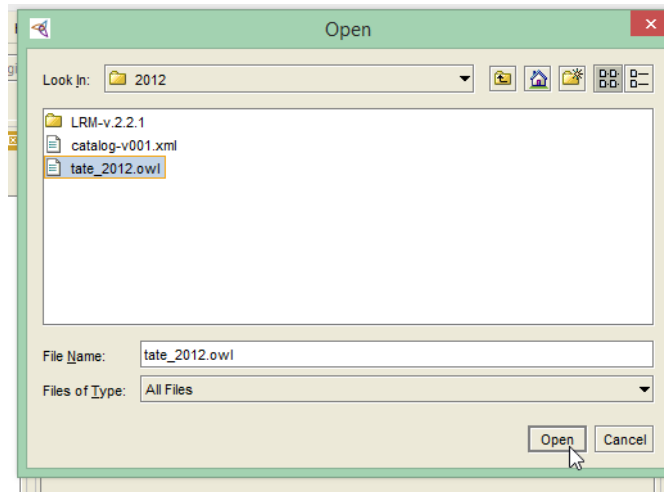
2.2. Usage Guide

As already described, the plugin allows the comparison of two consecutive ontology versions. The first ontology in the series is the one loaded in Protégé. Use menu *File* → *Open* to load it.

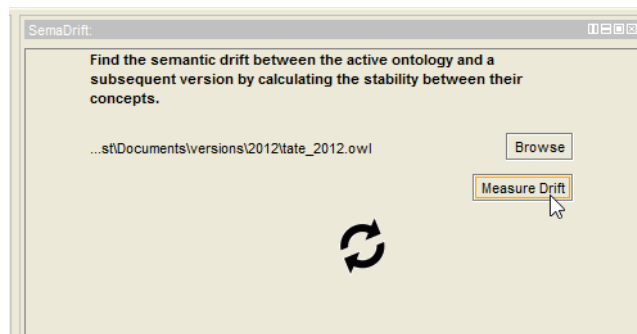
To load the second ontology from local storage, use the *Browse* button in the SemaDrift tab.



Locate the ontology file and press *Open*.



Next, click on button *Measure Drift* to perform analysis. A spinning animation will show while drift metrics are being calculated.



Finally, the metrics are displayed in multiple tables, namely Average Concept Stability for all concepts and Concept-per-Concept Stability for all four aspects.



3. SemaDriftFx

This standalone desktop application enables drift measurement between two or more consecutive ontology versions of choice. It provides a more user-friendly GUI for leveraging the SemaDrift Library API in the JavaFx framework, which allows more visual capabilities such as multiple ontologies and visual morphing chains. SemaDriftFx requires Java 8 to be installed.

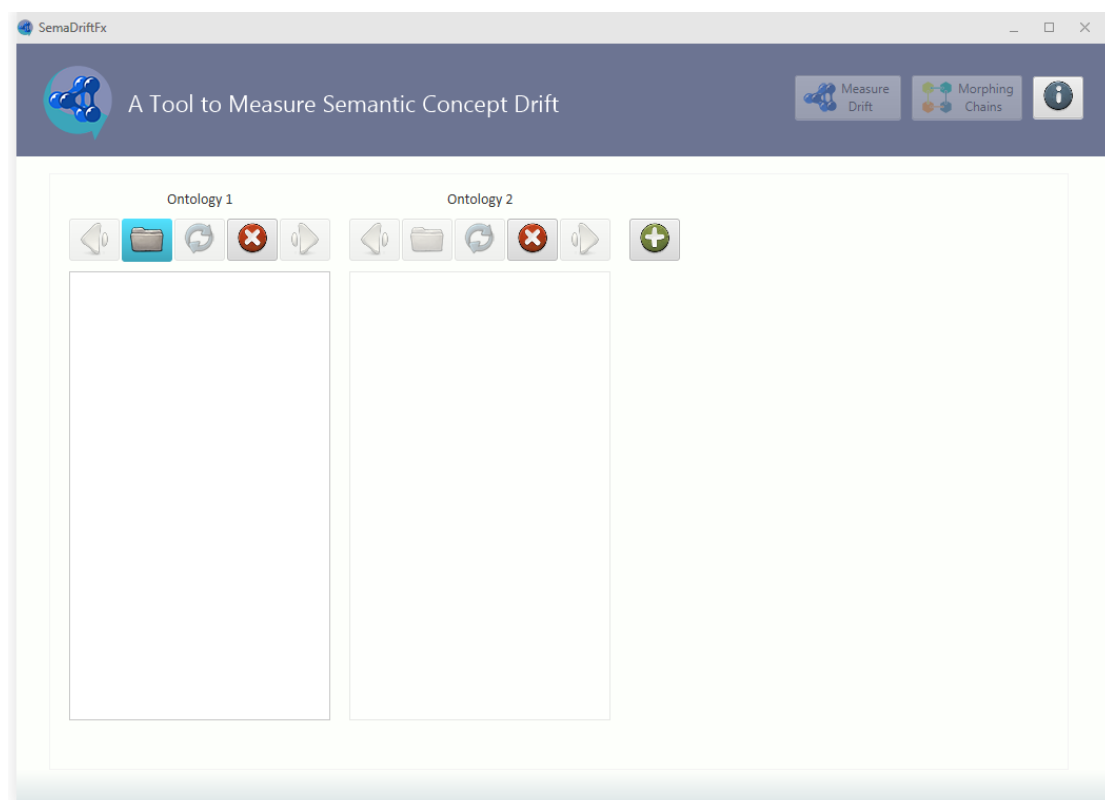
3.1. Installation

Step 1 - Install Java Runtime Environment 8 using this [link](#).

Step 2 - Download and extract the software using this [link](#).

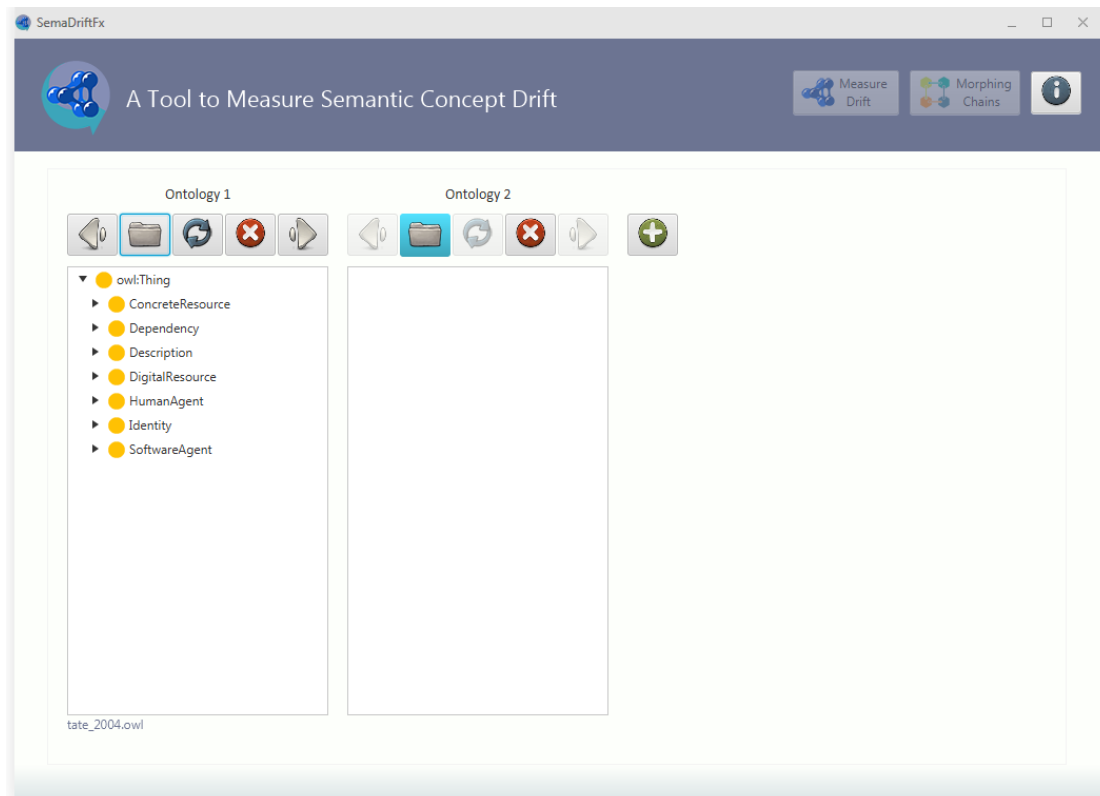
Step 3 - Run *SemaDriftFx.jar*.

3.2. Usage Guide

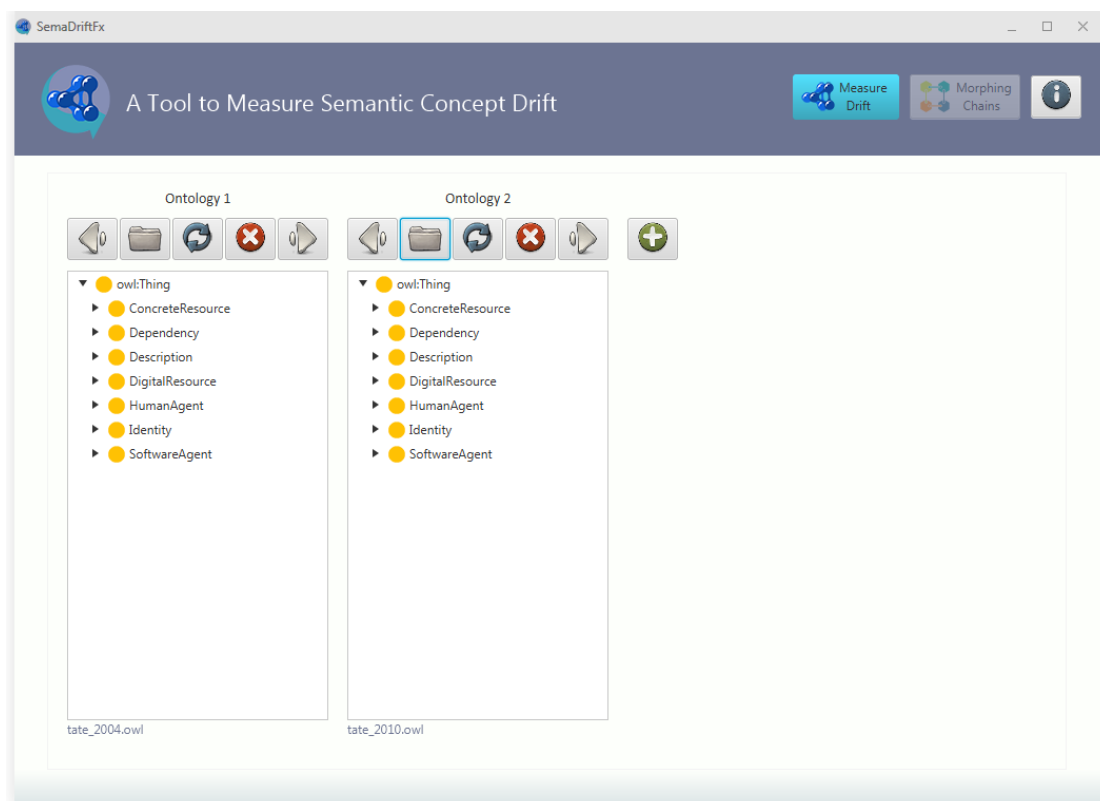


To load the ontologies to be compared, begin with the *Add ontology* button (plus icon) to add the required number of ontology slots. Then, press the corresponding *Open Ontology* buttons (folder icons) to load an ontology file to each slot. As shown below, each schema will be presented in the form of a tree.

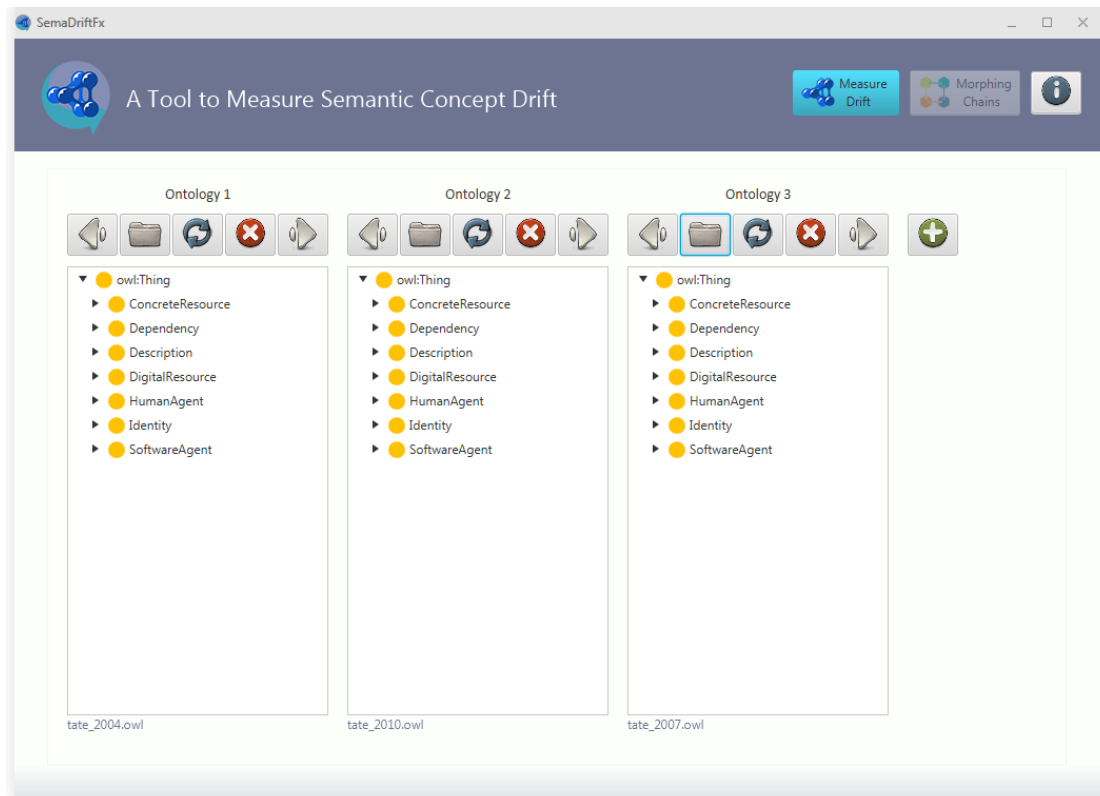
Note that some buttons are initially highlighted in blue to aid your first steps with the tool.



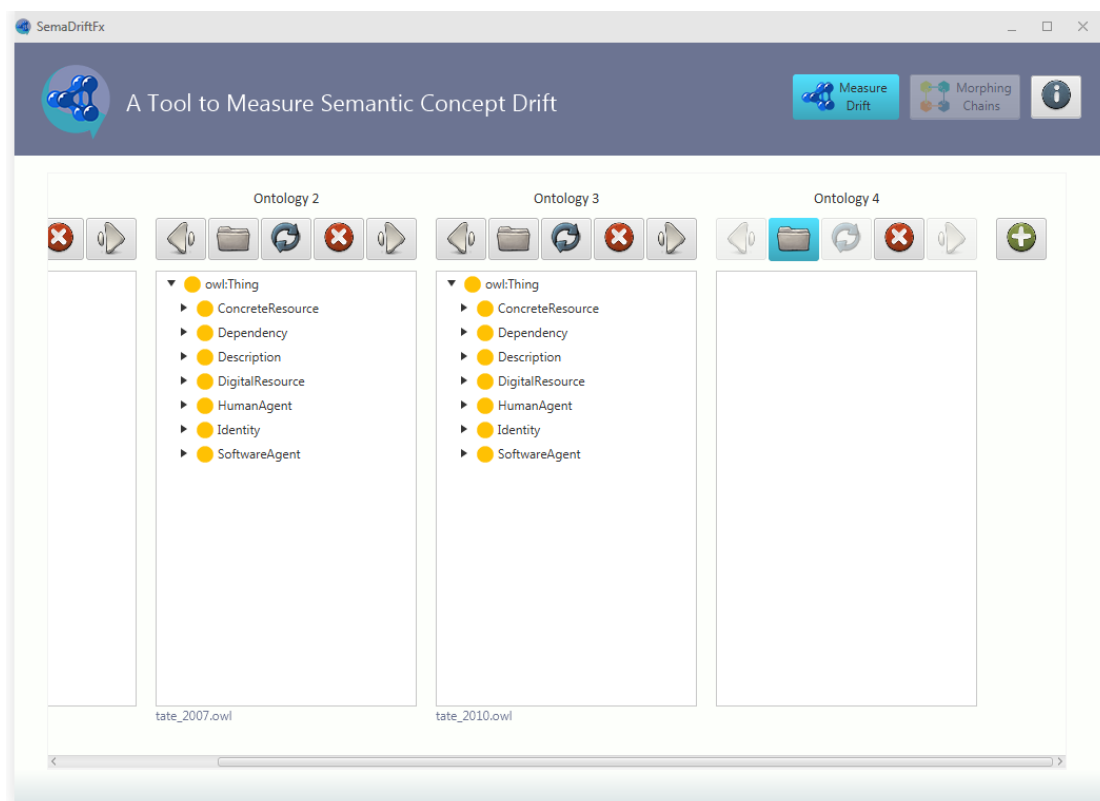
Ontology 1 is loaded, enabling us to load a second ontology.



Loading at least two ontologies enables the Measure Drift button to calculate the metrics.

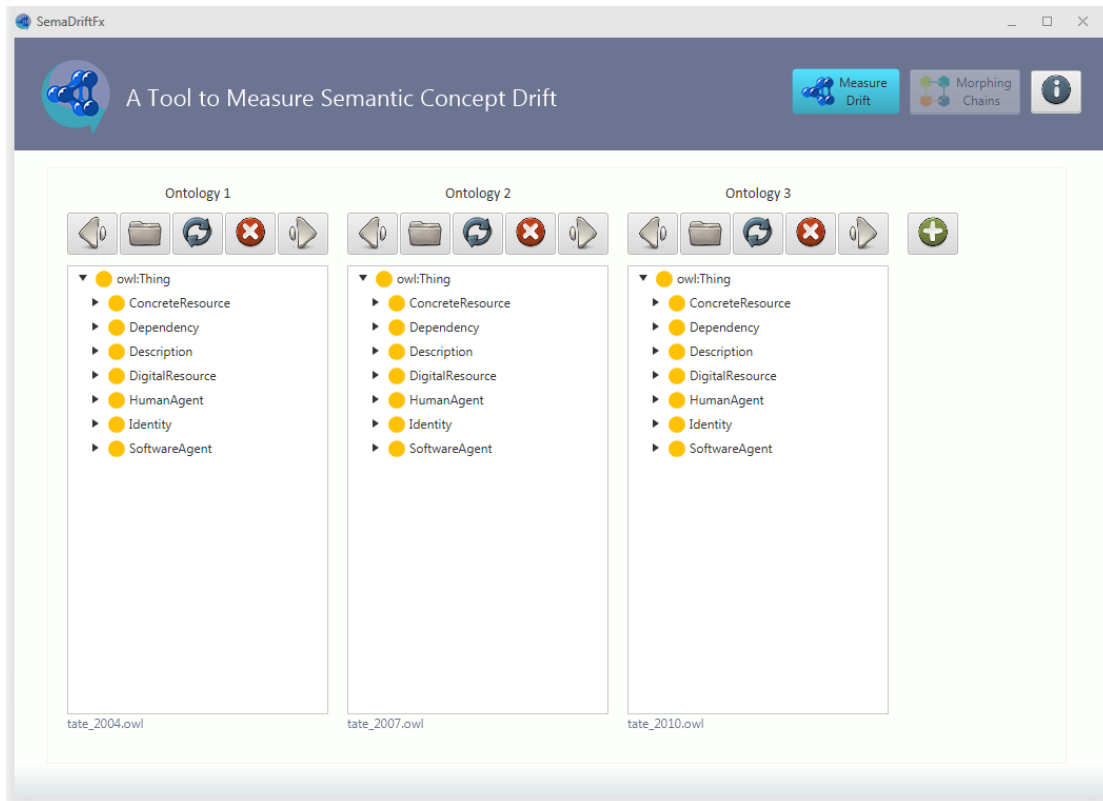


More ontologies can be added using the '+' Button.

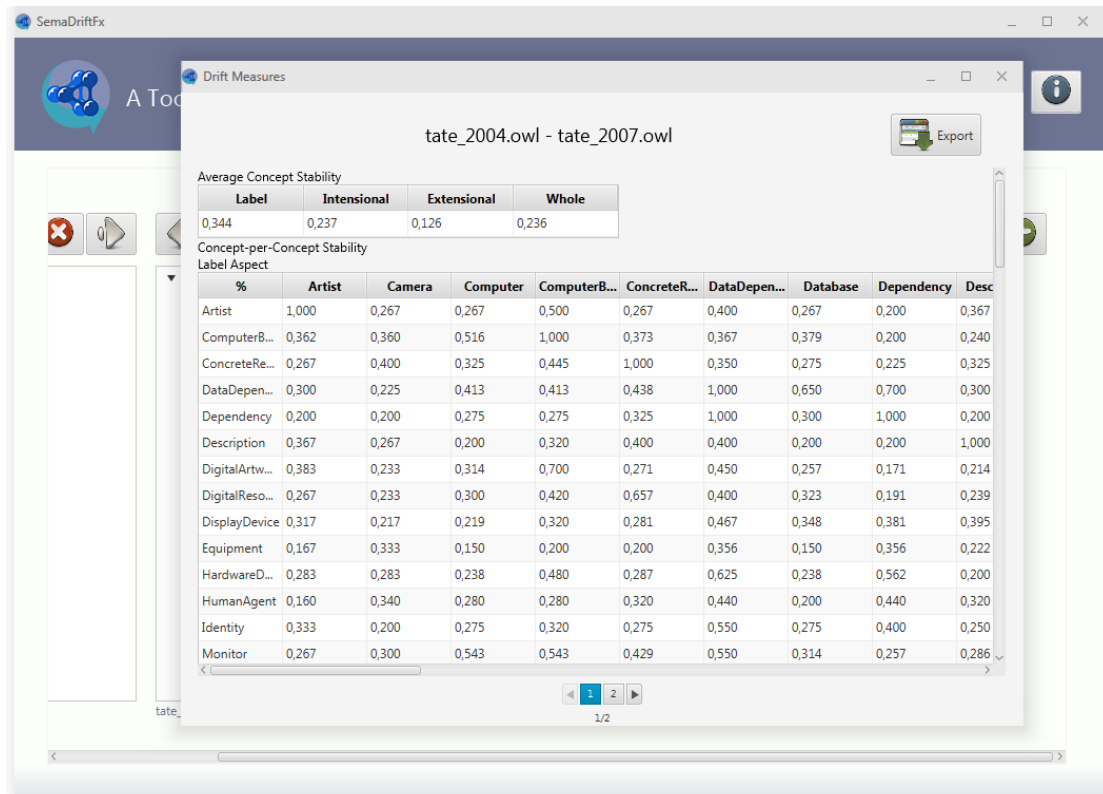


Any ontology can be removed via the 'X' button (*Remove Ontology*).

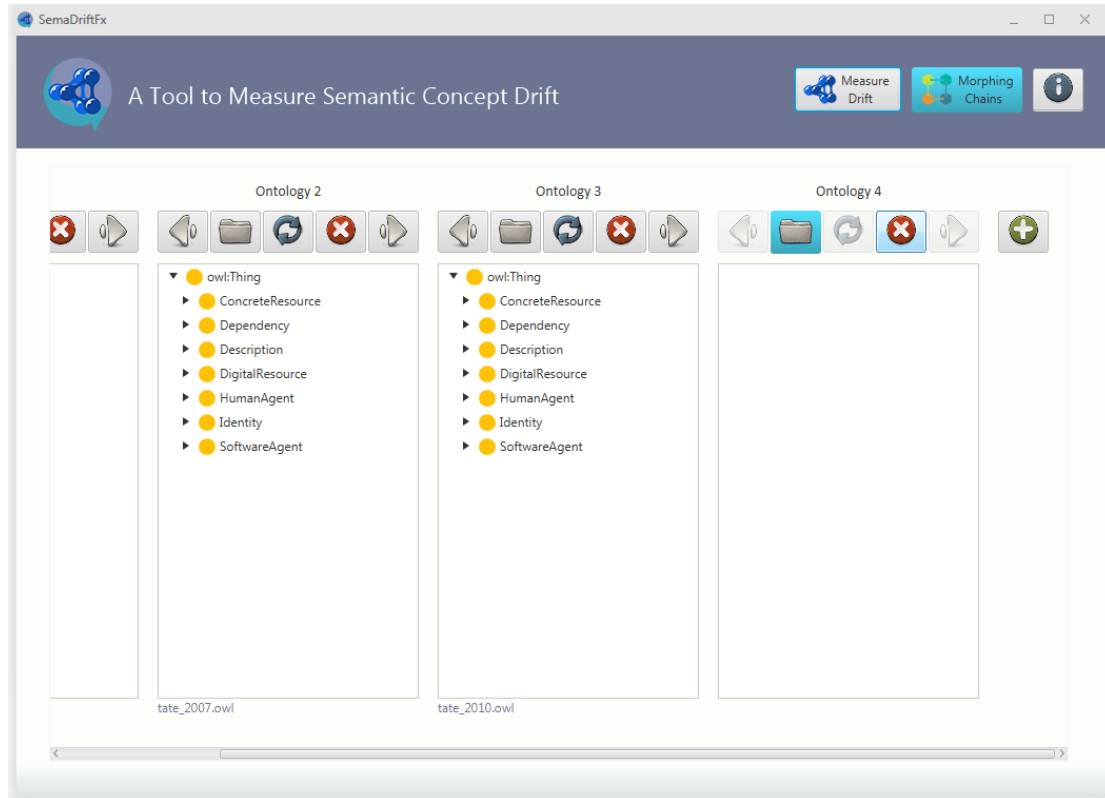
The ontology order can be altered using the arrow buttons, *Move Right* and *Move Left*. In this example *tate_2007.owl* is moved left from Ontology 3 to the Ontology 2 position.



By clicking on button *Measure Drift*, the software will calculate drift metrics. The results page is demonstrated in the next image.



Each consequent pair of ontologies is shown in its own page. The label on top shows which ontologies are compared in each page. To switch pages you can click the page number at the bottom or the left/right arrows. The results may also be exported in a [.tsv](#) file. For more information on the tables of results please refer to section 1. At any point the user may return to the main window, re-order or switch ontologies and measure drift once again.



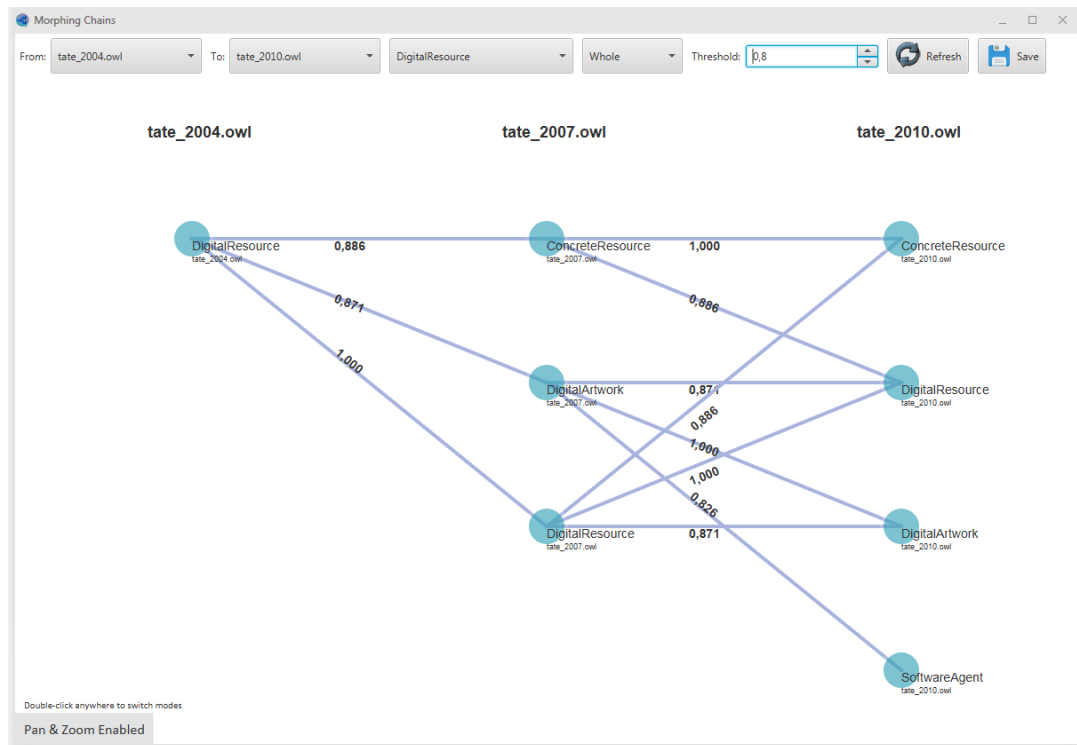
Another feature of SemaDrift Fx is the visualization of drift between schemas, named *Morphing chains*. After measuring drift metrics, the *Morphing Chains* is enabled.

Several options can be seen at the top of the window. First, the user is able to select two ontology versions as the beginning and the end of the morphing chain, meaning that all ontologies in-between will be included. The *From* ontology will have to precede the *To* ontology in the main window.

Note: to change the order now, you will have to go back to the main window, make changes and measure drift metrics again.

Then, the concept, i.e. class, of interest can be selected as the leftmost root of the graph, as well as the preferred aspect of comparison (between *label*, *intension*, *extension*, and *whole*). Finally, a minimum threshold of stability values to display can be set to filter out low stability values.

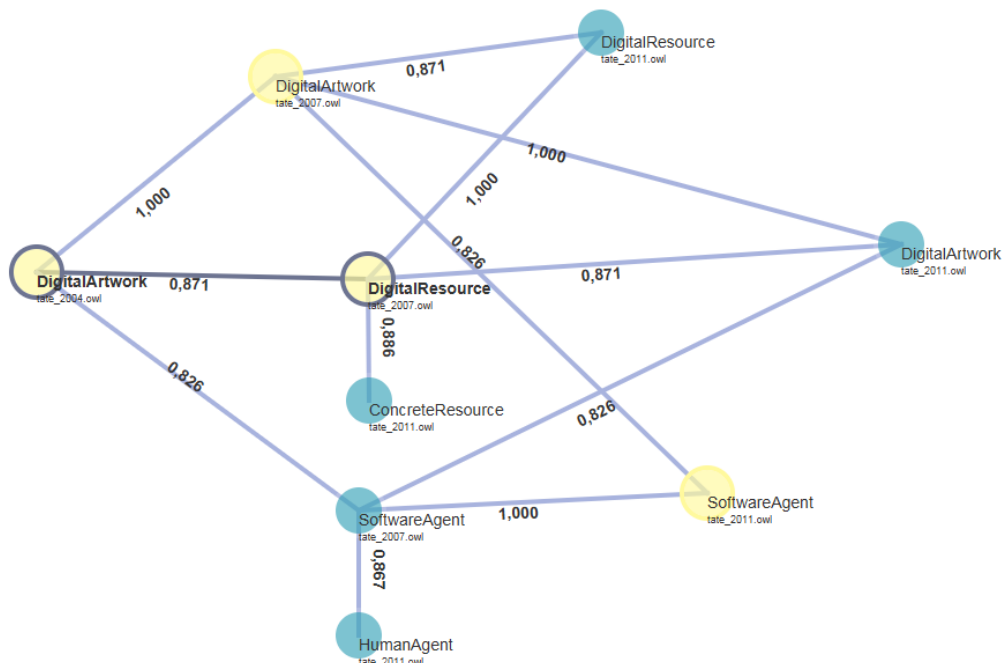
According to the user's settings, an interactive graph appears, showing how a concept drifted to other concepts and on what scale.



Double-clicking anywhere in the graph will switch modes. The current mode is displayed at the bottom left. The modes and capabilities are the following:

- Graph Locked: You can click to select nodes or click and drag to rectangle-select.
- Pan & Zoom Enabled: You can click and drag to pan the graph and scroll with the mouse to zoom in and out.
- Move Nodes Enabled: Click and drag on a node to move it, click and drag anywhere to move all selected nodes.

After moving the graph you can reset it to its initial form by using the *Refresh* button.



Use the *Save* button to save your graph as a picture.



Returning to the main window, pressing the *Information* 'i' button at any point, shows the software version, relevant links and contact.