

Project description

Semantic zoom support for Envision

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Introduction

Envision is an open source IDE being developed by Dimitar Asenov. Its goal is to ease understanding of code and to increase the user's productivity using program visualization. Usually programs are visualized only as text. Envision uses additional visualization techniques to try to help the programmer to work more efficiently.

This project aims to extend Envision to further improve the user's productivity by adding semantic zoom support. Traditionally a geometric zoom is used where affected objects only change their size. A greater overview is achieved by zooming out and being able to see more objects at the same time.

As opposed to geometric zoom, semantic zoom can not only change the size of an object but may also choose to display the object in a completely different way or not to display it at all. The greater overview here is achieved by only showing information of interest at the desired level of detail. This may also include additional information provided by the user about an object that is not part of its detailed representation.

In Envision an example of semantic zoom could look like this:

Whenever a class should be displayed zoomed out the class's implementation and private members would be hidden whereas its public interface would be completely retained.

Core Goals

The core goals describe the minimum requirements of this thesis and can be split up into the following tasks:

- C1: Design and create a framework that provides the features used to realize different semantic zoom levels in Envision.
- C2: Implement a zoom level where only the public interface of classes is shown and implementation details are omitted. To accomplish this task the framework created in C1 should be used.
- C3: Extend Envision's internal program representation to enable the use of additional information provided by the programmer. This information can be used by a semantic zoom level to show information about an object that cannot be inferred by existing data. This information could for example consist of a short summary about a project and describe its preferred visualization location with respect to other projects visualizations.
- C4: Make use of the additional information (described in C3) to create more meaningful results on a very coarse zoom level where visual elements would represent entire projects. Additionally show some statistics of a project.
- C5: Enable the user to directly edit the meta data used in C4 by interacting with the working area of Envision.

Possible Extensions

After the core goals are successfully completed the project may be extended according to the following ideas:

- Instead of having one global zoom level enable the user to semantically zoom each visual element individually.
- Generalize the way the zoom is obtained to enable the user to specify custom zoom levels. The way this could work is by having different filters that may be applied to an element to generate different visualizations. Such filters could be parameterized and combined resulting in a custom zoom level. A filter would take the current information about the object to be displayed as input, then change this information according to its functionality and then finally output the remaining information.

Schedule

25.11.2013: Envision	02.12.2013: Envision	09.12.2013: C1/Planning	16.12.2013: C1/Planning
23.12.2013: Presentation/Holidays	30.12.2013: Holidays	06.01.2014: C1	13.01.2014: C1
20.01.2014: C2/Exams	27.01.2014: C2/Exams	03.02.2014: C2	10.02.2014: C3
17.02.2014: C3/Report	24.02.2014: C4	03.03.2014: C4	10.03.2014: C5
17.03.2014: C5	24.03.2014: Extensions	31.03.2014: Extensions	07.04.2014: Extensions
14.04.2014: Extensions	21.04.2014: Report/Extensions	28.04.2014: Report/Extensions	05.05.2014: Report