

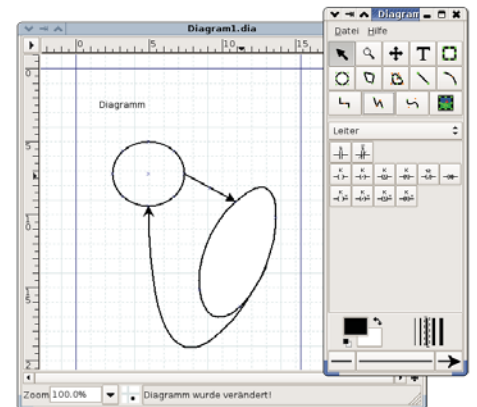
GTK+ 2.0 Bindings for VA Smalltalk

Bachelor Project Proposal, WS 2010/2011 – SS 2011
Software Architecture Group, Prof. Dr. Robert Hirschfeld

Project Description

Instantiations Inc. has a long history of providing program development tools for the Smalltalk community. In 2005, Instantiations acquired development and marketing rights to the IBM VisualAge Smalltalk product, an integrated development and runtime environment for Smalltalk. Since that time, Instantiations has produced several releases of what is now called VA Smalltalk. VA Smalltalk currently runs in several operating system environments.

Instantiations continues to receive requests to add support for the GTK+ APIs as an alternative for Motif when running on UNIX operating system platforms (currently AIX, Linux, and Solaris) in order to improve the overall visual quality of the user interface and to improve the visual integration of VA Smalltalk applications in to the Gnome desktop environment. Internal research has shown that there is considerable interest in such a product improvement from individual users.



Project Details

Instantiations Inc. proposes a Bachelor's project to investigate, design and implement bindings for GTK+ 2.0 in the VA Smalltalk code base. The VA Smalltalk product consists of a Smalltalk Virtual Machine (VM) together with a Smalltalk Class Library, an ENVY Manager code repository, and HTML-based documentation. Each of these components, with the exception of the ENVY Manager component, has dependencies on and/or interfaces with the graphics framework associated with the operating system platform. Therefore, to support a new graphics framework, each of these components is affected.

1. The Virtual Machine consists of C and assembler source modules. The modules that interface with the current X11 and Motif bindings are all written in C.
2. The Smalltalk Class Library for User Interfaces is also a mix of graphics framework-dependent and graphics framework-independent classes and methods. The classes are divided into 2 layers – a layer which provides the higher-level abstractions (exposing a common programming protocol based on X11 and Motif protocols) and a lower level layer providing the specific platform bindings to the specific graphic framework APIs.
3. The HTML-based documentation is only dependent on a particular graphics

framework binding in those areas which describe graphics framework and platform-specific interfaces and functions.

The project covers VM enhancements supporting the GTK+ 2.0 API calls and modifications to the Class Library to support the GTK+ 2.0 capabilities and GTK+ 2.0 interfaces to common functionality. Particular work items include:

- Investigating the GTK+ 2.0 APIs and comparing them to the X11 Motif APIs that are currently supported; as well as investigating the concepts and implementation of the VA Smalltalk User Interface class library layering.
- Determining how to map a new graphics framework binding under the existing common interface layer of classes, and accounting for possible architectural changes due to differences between the GTK+ 2.0 application and the X11 Motif application structure.
- Extending the existing common interface layer to handle GTK+ 2.0 functionality not available in X11 Motif.
- Determining the feasibility and designing the approach to allow selection of the appropriate graphics framework bindings at image startup time.
- Creating extensions to the existing VM Build mechanism to account for the possibility of multiple graphic frameworks on one operating system platform.
- Creating any tools that seem useful or desirable in the performance of the project.
- Providing information needed to update the existing VA Smalltalk documentation.

Organization

A group of six to eight (6-8) students may participate in the project. Organization and tasks will be determined by the project participants in close cooperation with Instantiations Inc., following the Extreme Programming development process. The project will be carried out at the Hasso Plattner Institute in Potsdam. In WS 2010/2011, participants will work on initial design sketches and prototypes. Main steps in design and implementation are to be executed in SS 2011.

Instantiations will provide technical guidance on the existing bindings for X11 and Motif as well as the existing VA Smalltalk widget- and graphic-framework specific user interface classes. Instantiations will provide other technical and project guidance as needed. This may be in the form of on-site visits (in Potsdam and/or Raleigh) as well as regular telephone, instant messaging, and email communications.

Partner & Contact

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