

Towards a humane graphical user interface for live electronic music

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Abstract

In this paper we describe findings related to user interface requirements for live electronic music arising from research conducted as part of the first three-year phase of the EU-funded Integra project. A number of graphical user interface (GUI) prototypes developed during the Integra project initial phase are described and conclusions drawn about their design and implementation.

Keywords: Integra, User Interface, Usability, Design, Live Electronics, Music Technology

1. Introduction

According to Raskin[1] in order to be humane, interfaces should meet the following criteria:

- **modeless:** user actions should have the same effect regardless of the application's state.
- **monotonous:** there should only be one way to accomplish any given task in the UI.
- **visible:** the 'right' features of an application should be visible at any given time and users shouldn't be forced to memorise that a feature exists.
- **affordance:** UI functions and operation should be obvious to most people in the culture for which it was intended and make use of already learned human skills.

A humane interface is a *usable* interface designed to be sympathetic to the way humans instinctively interact with computers, and not necessarily designed around the structure of computer hardware and operating systems.

2. Research process

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NIME09, June 3-6, 2009, Pittsburgh, PA

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Integra¹ is a project led by Birmingham Conservatoire in the UK and supported by the Culture programme of the European Union. Integra brings together new music ensembles and research centres to collaborate on a wide range of artistic and scientific activities centred around live electronic music. The initial 3-year phase of the project is now complete. During this period eleven European composers were commissioned to write works for five professional ensembles, partners in the project. As part of the composition process the composers were each paired with one of the eight research centres in order to develop the 'live electronics' of their compositions.

The process resulted in successful performances of all works involved including premieres at the first Integra Festival held in Birmingham in June 2008. However it also highlighted some important issues relating to the Integra project's scientific objectives, namely the development of a new environment for live electronics. The two following observations are particularly pertinent:

- The tool chosen by the majority of composers for the composition and performance of the live electronics was Max/MSP by Cycling74².
- The relationship between composers and research centres was primarily collaborative, but in many cases composers were highly dependent on the research centres for technical assistance.

We observed in some cases, that the traditional relationships of composer and musical assistant emerged, with the musical assistants interpreting, facilitating or simply executing the composer's artistic wishes on their behalf. Composers often employed other tools, for example Protools, Csound, VST plugins as auxiliary applications in the creative process. These were used for preparatory work such as pre-processing source material prior to incorporating into a 'live' context.

Since most of the compositions commissioned by Integra involved interaction between (acoustic instrumental) performers and the electronics, we were also able to observe the reactions of the performers to the live electronics systems devised by the composers and researchers. Reactions were

¹ www.integralive.org

² www.cycling74.com

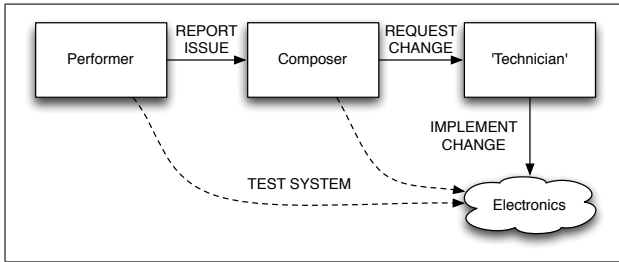


Figure 1. Diagram illustrating observed dependence between performer, composer and 'technician'.

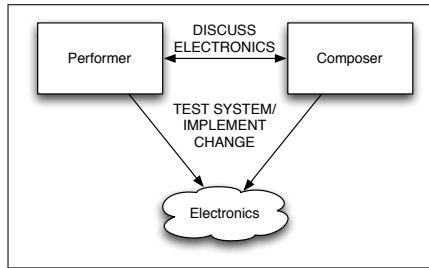


Figure 2. Diagram illustrating ideal scenario where performer and composer interact with the software on equal terms without technical assistance.

mostly positive, with performers showing a sense of discovery and excitement in 'playing' with the electronics. However, in some cases this was accompanied by a feeling of uncertainty, especially when the electronics seemed not to be working as expected. We also noticed a secondary level of dependence for technical assistance if changes were required in the electronics for musical reasons. This 'distancing' of the performers from the electronics is shown in Figure 1. We believe that if the software systems used for the live electronics were sufficiently humane and usable then the performer and composer would become empowered, and less dependent on the 'technician'. This would lead to the relationship shown in Figure 2.

3. Towards a GUI for live electronics

Overall, the Integra environment concept is based on a model view controller (MVC) paradigm, where the GUI forms the view, a shared library (libIntegra) provides the controller functionality and an online database (or local XML file hierarchy) provides the model. A conceptual framework for the user interface has been devised by analysing the requirements of composition, rehearsal and performance activity in practical music making observed throughout the first 3-year phase of the Integra project.

A number of user interface prototypes have been developed reflecting this model. We started with a small number of GUI mockups showing an initial layout and workflow. These mockups and supporting documentation are available on the project wiki³. UI prototypes have subsequently been developed in Java, Javascript/XUL, and Max/MSP/Javascript.

³ <http://wiki.integralive.org/integra2.design>

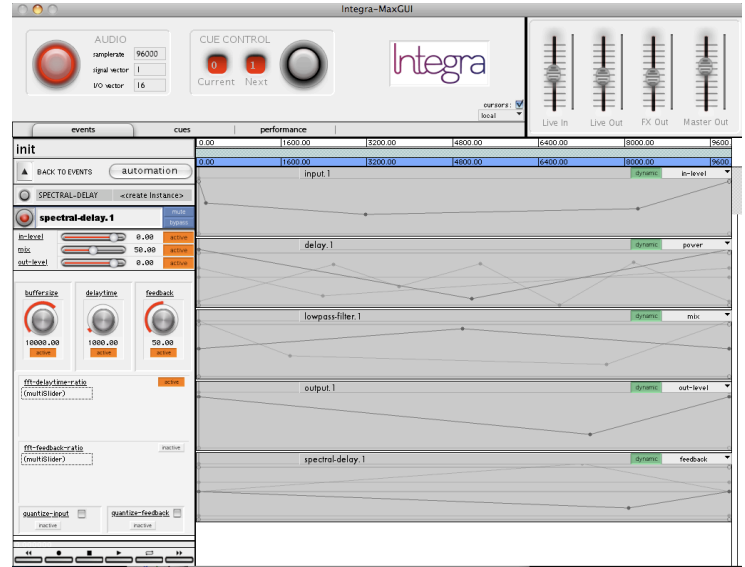


Figure 3. Integra prototype GUI developed in Max/MSP by CIRMMT, McGill University, Montreal.

Multi-platform development has been chosen in the early stages of the project in order to simultaneously develop UI ideas and evaluate development environments for the final product. The most evolved prototype was developed by Integra project partner CIRMMT and is shown in Figure 3.

This GUI is functionally compatible with libIntegra version 0.3.1[2] and is capable of loading, connecting and sending control data to Integra modules hosted in a supported DSP environment.

4. Future Work

Now that we have several GUI prototypes and a body of research in performer/composer HCI to inform our work, our next task is to implement the user interface in a more robust and full-featured manner taking into account any usability deficiencies found in the GUI prototypes. We are now working in partnership with usability and user experience consultants to ensure that we achieve our goals. We have obtained funding to achieve this and plan to make a public release in 2010. We intend to capitalise on our position as Conservatoire-based researchers to employ user testing early in the development process, through to release.

References

- [1] J. Raskin, *The Humane Interface: New Directions for Designing Interactive Systems*, Addison-Wesley Professional, 2000.
- [2] J. Bullock and H. Frisk "LibIntegra: A System for Software-Independent Multimedia Module Description and Storage" *Proceedings of the International Computer Music Conference (ICMC)*, Copenhagen, 2007.