

# Methods and Tools for the Design of Multi-Platform Applications and Remote Usability Evaluation

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**Abstract:** The main objective of this tutorial is to disseminate results in research on methods and tools for universal usability. To this end, we show how automatic tools, models and related methods can support the design and development of interactive applications that can be accessed through various platforms (PDAs, Mobile phones, Desktop systems, ...) and their remote evaluation (when users and evaluators are separated in time and/or space).

**Keywords:** Multi-platform Applications, Remote Usability Evaluation, Models and Tools.

## 1 Introduction

The rapidly increasing availability of a large spectrum of interaction devices that can be accessed from many types of environments risks creating chaos because designers of interactive applications have difficulties in managing all the relevant factors. Whenever there is some complexity to manage, humans tend to create models to highlight the important aspects to consider. In human-computer interaction a number of models have been used to support designers and developers by highlighting relevant aspects that they should take into account and providing logical descriptions of such features. For example, task, user, domain, context, presentation, and dialogue models, as well as scenarios have widely been used. Such models can also be useful to address the new challenges, such as those raised by the increasing platform variability. However, we need at least two key elements to take advantage of them: automatic tools and transformations for moving from one model to another or to the system implementation and vice versa. The basic idea is that the design and evaluation process can be effective if it is supported by a flexible set of tool-supported transformations.

There are many potential transformations, but we do not need all of them in all situations. The choice of which transformation to perform depends on the current goals, the material and time available, the

characteristics of the application domain, and so on. For example, in some cases designers have to start from scratch and so they need to envision the main features of the new system, whereas in other cases there is an existing system for which the underlying abstractions must be identified in order to evaluate it and determine suggestions for improvements. The goal of this tutorial is to provide an introduction to these problems and their possible solutions, as well as a number of examples of transformations and tools supporting them, most of them developed at the HCI group of ISTI-C.N.R..

## 2 Learning objective

Achieving the goal of universal usability poses a number of difficult issues. This tutorial addresses some of them. It is to be held as a half-day tutorial and is designed as a stand-alone event for anybody who wants to learn about tools and methods for the design of multi-platform applications and remote evaluation of user interfaces.

The main learning objective is to disseminate results in research on methods and tools for multi-platform user interface design and remote evaluation. To this end, we plan to show how automatic tools, models and related methods can support the design and development of interactive applications that can be accessed through various platforms (PDAs, Mobile phones, Desktop systems,

...) and their remote evaluation (when users and evaluators are separated in time and/or space).

One key aspect of the tutorial is to enable attendees to directly practise the use of the above mentioned methods and tools through some interactive exercises in order to provide hands-on experience with the state of the art.

### 3 Tutorial Structure

The tutorial starts with a description of the structure and objectives of the tutorial itself and an introduction to the models that are relevant in the design of multi-platform applications and remote evaluation. We devote particular attention to task models, how to represent them and analyze their content and their combined use with informal descriptions, such as scenarios.

Next, we move on to discuss how the information contained in the models described can be used to support the design of user interfaces of multi-platform applications that allow users to access data through various types of devices, including mobile ones. Criteria for selecting the most suitable interaction and presentation techniques will be introduced. We also discuss the use of XML-based representations in order to represent the relevant modelling concepts and manipulate them.

Another issue that is considered is how to support remote evaluation, in particular by leveraging the information contained in task models. For example, we discuss Web usability analysis with tool support by considering user interaction logs and the task model of the application.

The state of art in the area of multi-platform application design and remote evaluation is reviewed in order to provide a broad view of the issues considered, as well as the current trends and problems. We also discuss a research agenda in the field and leave some time at the end for open discussion with participants.

### 4 Audience

The issues considered in the tutorial have been discussed widely, though mainly in a research context. Now they appear mature for broader dissemination. Indeed, the first tools for the design of multi-platform applications are starting to be made available, and there is a need for disseminating their potentials, features and advantages).

This is an area that can be interesting for interactive software developers and designers who want more support than that currently furnished by

most current visual editors and toolkits. Likewise, user interface designers could benefit in that they could perform their work more effectively, making their design choices more explicit. In addition, other researchers who would like to have an update on the state of art in the field can be interested in the tutorial.

Tutorial participants do not need to have any specific background knowledge to reap benefits. However, general familiarity with some HCI design principles or with some user interface development tool would be helpful.

### 5 Instructor

Fabio Paternò received his Laurea Degree in Computer Science from the University of Pisa (Italy) and his Ph.D. in Computer Science from the University of York (UK). Since 1986 he has been working at C.N.R. in Pisa, currently at ISTI, where he is senior researcher and head of the laboratory on Human Interfaces in Information Systems.

He developed the ConcurTaskTrees notation for specifying task models and has also designed an associated environment (CTTE) to support the development and analysis of task models specified through this notation, which has been used in various industries and universities. The tool has been implemented mainly during the GUITARE R&D Esprit Project. In these years he has also been working on methods and automatic support for usability evaluation. This work has produced a number of tools (the last one is WebRemUSINE) that perform their analysis using information contained in task models and logs of user sessions automatically created. Recently, he has also turned his attention to how to integrate usability and accessibility issues, a research area for which he has engaged a blind Ph.D. student.

He is the coordinator of the CAMELEON R&D IST Project, a three-year project started on October 1 2001, which aims to develop methods and tools for the design of context-dependent interactive applications. During this project the TERESA tool is being developed to support designers of multi-platform interactive applications. In this area, an ongoing collaboration with the Marble Museum has led to the deployment of a location-aware, infrared-based, handheld guide that is available to all museum visitors.

He has published over one hundred papers in refereed international conferences or journals.