

Belgian Lab. of Computer-Human Interaction (BCHI)

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ABSTRACT

This paper describes the BCHI research/development group at UCL-IAG and presents an overview of the main themes and projects conducted in this group.

KEYWORDS : computer-aided design of user interfaces, context-sensitive user interfaces, cross-platform user interfaces, heuristic inspection, model-based approaches, reverse engineering of user interfaces, tools for working with guidelines, usability engineering, user interface engineering, XML technology.

INTRODUCTION

The Belgian Laboratory of Computer-Human Interaction (BCHI) is conducting research, development, and consulting services in the domain of user interface engineering. This domain is located midway between software engineering, human-computer interaction, and usability engineering. Its long term goal is to be able to rely on a global approach for engineering the development life cycle of the user interface (UI) of information systems. This approach consists of :

1. A series of models pertaining to various facets of the UI such as : task, domain, user, presentation, dialog, platform, context of use, etc. Each model is manipulated through XML files governed by a common Document Type Definition.
2. A step-wise method towards computer-aided design of user interfaces (CADUI) based on any combination of the above models (fig. 1).
3. A suite of software engineering tools that support the developer during the UI life cycle according to the CADUI method. The CADUI logo (fig. 2a) gathers under its banner all initiatives towards a software support for model-based approaches to design and develop UIs.

The long-term goal subsumes at least three subgoals: (i) to ensure UI design in a flexible manner according to a model-based approach with explicit consideration of UI design guidelines to encourage a

logical process rather than a « rush to code » approach based on experience only ; (ii) to allow a continuous UI evaluation based on the same guidelines throughout the process ; and (iii) to maximise the recuperation of existing UIs by reverse engineering and inventorisation to increase UI components reusability and to migrate UIs towards modern UIs with advanced interaction techniques, including context-sensitivity.

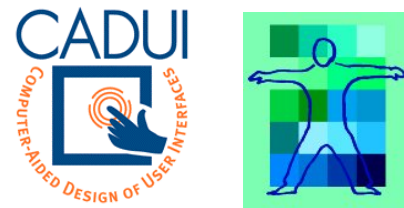


Figure 2. CADUI logo (a) ; BCHI logo (b).

DOLPHIN

Domain Ontologies Leading to the Production of Human-computer Interfaces (DOLPHIN) [5] consists of a user interface design assistant that helps designers and developers to solve the mapping problem between models involved in a model-based approach to designing an interactive application. In particular, it is aimed at producing dialog and presentation models from various task models regardless of their types. The mapping problem is solved automatically when validated algorithms exist and manually when no such algorithms or design heuristics currently exist to map models and their elements.

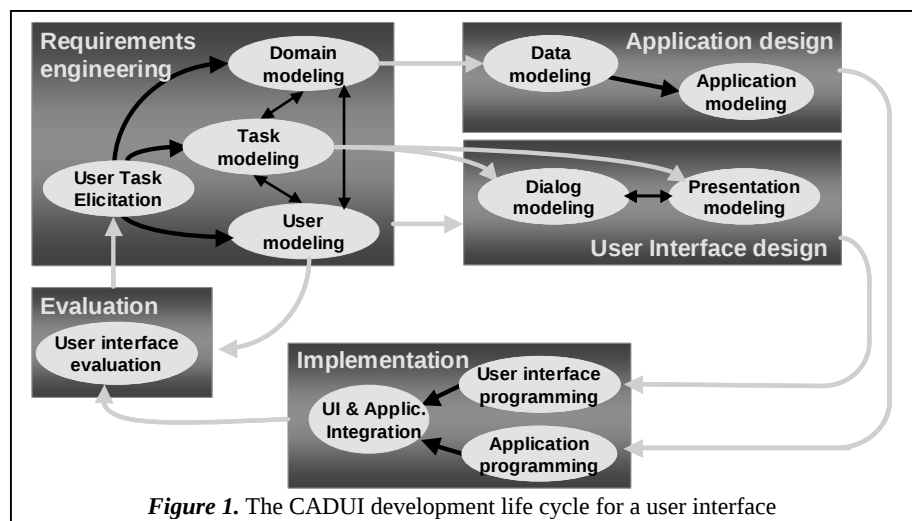


Figure 1. The CADUI development life cycle for a user interface

E-GUIDE

Electronic Commerce usability GUIDE (E-GUIDE) consists of a repository of design guidelines for electronic commerce web sites based on multiple types of criteria : ergonomic, graphic, and on-line marketing. Guidelines maintained in this repository are partially assessed through metrics aggregated from log files data regarding utility and usability [7]. When possible, the web pages to be evaluated are submitted to a static analysis for automated usability evaluation. In particular, guidelines for accessibility and for globalization are considered. Any localized web site evaluation should consider not only the localization of the guidelines, but also the localization of the software tool itself and of its evaluation report [1].

METROWEB

METROlogy of the Web (METROWEB) consists of both a method and a web-distributed tool to manage multiple guidelines bases towards evaluation of web sites [4]. It serves as a usability knowledge repository to conduct a web site evaluation based on heuristic inspection. The METROWEB web site supports the organizational process of creating a corporate-level guidelines base, including definition, reviewing, modifying, validating, and final acceptance. Evaluation techniques that facilitate the evaluation of any guideline are also recorded.

PIRATES

Methods and Tools for Dependable Transparent Distributed Programming (PIRATES) is a research program in Distributed Computing conducted by Dept. of Computer Science (UCL) in which we participate for context-sensitive user interfaces. This family of user interfaces is expected to work on several computing platforms, possible with different sets of constraints, and is able to automatically change its presentation and/or its dialog depending on the current set of constraints.

SALAMANDRE

SALAMANDRE [6] is interested to produce multiple UIs for different contexts of use from a task model describing these different contexts, while taking into account the current set of constraints which are posed in each context and design knowledge that addresses these constraints [2]. Guidelines related to different computing platforms are gathered in guidelines bases maintained in METROWEB. In collaboration with the Telecommunications Unit (TELE), mobile and multi-platforms UIs are considered in two case studies: telemedicine and multimedia narration

VAQUISTA

reVerse engineering of Applications through Questions, Information Selection, and Transformation Alternatives

(VAQUISTA) is a set of techniques established to reverse engineer UIs that were not designed according to a model-based approach to incorporate them in the same pipe-line and to allow migration of UIs from one computing platform to another. The current subgoal of VAQUISTA is to reverse engineer a web page onto a presentation model according to flexible heuristics. The flexibility of this process is of high importance considering the many design options that may have been decided at design time. Therefore, the process is guided by questions to the designer, information selection in the contents, and transformation alternatives.

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