

Teaching User Interface Development to Software Engineers

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ABSTRACT

Teaching User Interface Development to Software Engineers is an overview of the analysis, design, implementation and evaluation topics to teach and the resources to teach them to software engineers, the people who make most of the user interface design decisions. The goal is to improve the quality of user interface development instruction for software engineers and in turn improve the quality of the user interfaces they build.

KEYWORDS

[K.3.2] Computer and Information Science Education, Curriculum; [K.6.1] Project and People Management; Staffing, Training, Human Factors, Management, Education, Software Engineering, User Interface

INTRODUCTION

There are not many specialists in user interface development, so most software user interfaces are designed and built by software engineers. These engineers need training about how to build usable and useful user interfaces, but the scarcity of user interface specialists is correlated with the lack of educators ready to train user interface developers. The materials presented here are designed to improve the quality of user interface development training. A software engineer who has been trained in user interface development should have gained perspective, learned about methods and tools, and gained an appreciation of their limits. Their **perspective** should include: the importance of the user interface, the impact of good and bad user interfaces, and the diversity of users and applications. About **methods and tools** they should know: the tradeoffs of design decisions involving different dialogue types and input/output devices, the information resources available for design, the benefits and costs of

developing tools for user interface implementation, the need to integrate training materials with the user interface, the need to evaluate system usability, and information about some design and evaluation tools. Finally, software engineers building user interfaces must know the **limits of their knowledge**: when and how to work with human factors engineers as consultants for design and evaluation, when and how to work with technical writers for implementation of a system of user guidance, when and how to work with a statistical consultant, and the difficulty of measurement and the complexity of making decisions based on data.

CONTENT

The material in the tutorial is organized around the curriculum module developed by the instructor for the Software Engineering Institute at Carnegie-Mellon University. The first computer science course suggested by the ACM SIGCHI report on Curricula for HCI closely matches this organization. The tutorial will stress the content of a first course to be offered to computer science majors and software engineers. The content focuses on an iterative development lifecycle of practical cost-effective methods for the analysis, design, implementation, and evaluation of user interfaces. There will be treatment of lecture material, motivating demonstrations, and reinforcing exercises. Widely available and economical Mac and PC hardware and software will be discussed, with some references to common workstation environments.

OBJECTIVES

- To develop realistic expectations of what can be taught, at what cost, to what benefit, in what period, to whom.
- To increase awareness of resource materials for teaching user interface development.
- To improve the quality of the teaching of user interface development by discussing content, demonstrations, exercises, and projects.
- To help attendees design their own course materials on user interface development for practically-oriented industrial and academic students.

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AUDIENCE

Different audiences will get different benefits from this tutorial and will view the material at different levels. There are no prerequisites, other than an interest in the topic of educating software developers about user interface development. This tutorial is best viewed as intermediate level because it assumes some general knowledge of the field of HCI. The intended audiences include:

- **Educators** who want to integrate user interface development into their software engineering courses or who want to teach material on user interface development.
- **Industrial** user interface and human factors specialists who wish to disseminate their expertise throughout organizations by presenting tutorials on selected topics.
- **Managers** who want to increase awareness of what can and should be common knowledge on user interface development in software development environments.

RESOURCES

Much of the tutorial is an overview of resources for HCI education, most of which are in electronic form and freely available on the Internet. The tutorial will cover how to access these materials using FTP (file transfer protocol), electronic mail services, WWW (World-Wide Web) browsers such as Mosaic and Lynx, and even floppy disk distribution. Also covered will be the uses of the SIGCHI mailing list for educators: `educators.chi`. Several of the resources are listed in the bibliography for this summary, and all the resources can be found in issues of *ACM interactions* magazine.

TOPICS

Issues in Teaching UI Development
 Resources for Teaching UI Development
 The SEI Curriculum Module
 The HCI Bibliography
 ACM SIGCHI Curricula in HCI
 ACM SIGCHI Education Survey
 UI Development Content
 User Interface Analysis and Design
 User Interface Implementation
 User Interface Evaluation
 Demonstrations and Readings
 Exercises and Projects
 Priorities in Teaching
 Reflections on Past Experiences
 Recommended Readings

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