Introduction to Interface Accessibility

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Abstract

The objective of this course is to provide an overview of interface accessibility for people with disabilities. The course will focus on three areas: 1) technical foundations of accessibility, 2) user-centered design methods for accessibility in systems development, and 3) research methods for involving people with disabilities in accessibility-related research.

Author Keywords

Human-Computer Interaction, Accessibility, User-Centered Design, Research Methods, Disability, Web Content Accessibility Guidelines

ACM Classification Keywords

Human Centered Computing: Accessibility: Accessibility theory, concepts and paradigms

Benefits

This two-unit course provides an overview of interface accessibility for people with disabilities. The course provides both the technical details, such as interface guidelines and toolkits, as well as information on including people with disabilities in both development projects and research projects.

Learning Objectives

The objective of this course is to provide a basic understanding of research and practice related to interface design for people with disabilities.

Content

The course material is divided into three sections: 1) technical foundations of accessibility, 2) user-centered design methods for accessibility in systems development, and 3) research methods for involving people with disabilities in accessibility-related research.

1. **Technical Foundations of Accessibility** include an understanding of how accessibility APIs provide a bridge between software applications and assistive technologies. In this course participants will learn the basic concepts of accessibility APIs and how screen readers use this information to provide an alternative experience to the user. Participants will also learn about the need to support standard accessibility features of the operating system, including keyboard support, high contrast themes and keyboard focus styling. The course will review how the W3C Accessible Rich Internet Application (ARIA) 1.0 and HTML5 specification provide a vocabulary for describing a web application interface to users of assistive technologies and standardizing how the information is being communicated to accessibility APIs. Standards are needed to support interoperability to make web content more accessible to people with disabilities using a wide range of technologies. Participants will be introduced to the concepts of the W3C Web Content Accessibility Guidelines (WCAG) 2.0 and how WCAG2ICT is providing guidance for non-web technologies. Participants will also be introduced to other accessibility-related standards, such as EPUB3.

2. **User-Centered Design Methods for Accessibility** in Systems Development. User centered design (UCD) encompasses a range of techniques and approaches aimed at involving diverse users including users with disabilities in the system development process in order to ensure that the systems are usable for diverse user populations. UCD is an iterative process and includes user perspectives throughout the development process, from identifying and analyzing users' needs and context, to design, development, and evaluation. This course will demonstrate the basic concepts associated with UCD including methods for crafting personas and scenarios, user testing, and qualitative and quantitative data collection and analysis for ensuring accessibility. Participants will learn about the role of users in creating, testing and implementing accessible user interfaces. Participants will learn about methods for involving broad and representative groups of people in the system development process.

3. **Research methods for involving people with disabilities in accessibility-related research.** It is important that users with perceptual, motor, and cognitive disabilities be directly involved with human-computer interaction research. When researchers don't directly involve people with disabilities, they often make assumptions, which often wind up being inaccurate stereotypes. This course will cover the various inclusion criteria for different types of studies (level of disability, experience with assistive technology, communication method), participant recruitment, and figuring out the sufficient number of participants for different research goals. This course will also address methodological concerns, such as whether to use a standard technical environment or a user's own assistive technology setup, and determining when

interventions are appropriate. The course will discuss different ways to modify research documentation for participants who need it in different formats, and best practices in adjusting methodologies for people with cognitive disabilities. Methods and techniques will be illustrated by real examples from industry and academia.

Audience

The target audience for this course, is individuals who have limited experience in research or practice involving people with disabilities, but have experience with the basic concepts of human-computer interaction (such as interface design, input/output design, human cognition, and evaluation methods). The assumption is that attendees have a basic understanding of web programming languages.

Prerequisites

There are no prerequisites for this course. The assumption is that participants will have a basic understanding of HCI concepts and a basic understanding of web programming.

Presentation Format

The course is formatted as a lecture, including two hands-on exercises. One exercise will involve people trying out the already-existing accessibility features within their own devices. Another exercise will involve a role-playing activity for requirements gathering.

Instructors' Background

Jonathan Lazar is a Professor of Computer and Information Sciences at Towson University, USA, where he is director of the undergraduate program in Information Systems. He has published 10 books, including "Research Methods in Human-Computer Interaction" (co-authored with Feng and Hochheiser, 2nd edition to be published in April 2017), and "Ensuring Digital Accessibility through Process and Policy" (co-authored with Goldstein and Taylor), has published primarily on interface accessibility for people with disabilities, and he served as the Adjunct Chair of Public Policy for SIGCHI from 2010-2015, and was the recipient of the 2016 SIGCHI Social Impact Award.

Jon Gunderson is the Coordinator of Assistive Communication and Information Technology Accessibility in the Division of Disability Resources and Education Services (DRES) at the University of Illinois at Urbana/Champaign. He is the past chair of the W3C User Agent Working Group and currently involved in Web 2.0 technologies more accessible as part of the W3C Protocols and Formats and W3C WCAG Techniques working groups. He leads the development of the open source web evaluation tools Functional Accessibility Evaluator (FAE) 2.0 and AInspector add-ons for Firefox browser.

Weiqin Chen is a Professor of Human-Computer Interaction and Universal Design of Information and Communication Technology (ICT) at Oslo and Akershus University College of Applied Science where she is leading the research group of Universal Design of ICT. Her current research focuses on methodological issues for accessibility in system development.

G. Anthony Giannoumis is an Assistant Professor of Universal Design at Oslo and Akershus University College of Applied Science. His research focuses on technology law and policy. He is currently researching

the implementation of policies aimed at ensuring equal access to technology. His research interests include universal design, international governance, social regulation, and standardization, and he has also conducted research on assistive technology, and intellectual property.

Resources

Attendees are encouraged to consult the books listed below. Suggested readings for follow-up information will be given during the course.

References

[1]   Lazar, J. (ed.) (2007). *Universal Usability: Designing Computer Interfaces for Diverse User Populations*. Chichester, UK: John Wiley & Sons.

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[3]   Lazar, J., Goldstein, D., and Taylor, A. (2015). *Ensuring Digital Accessibility Through Process and Policy.* Amsterdam: Elsevier/Morgan Kaufmann Publishers.

[4]   Lowdermilk, T. (2013). *User-Centered Design: A Developer's Guide to Building User-Friendly Applications.* O'Reilly Media.