The Making of Cross-Device Experiences: A Hands-on Workshop

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Abstract
Studies show that people often use several devices together to carry out everyday tasks, but there are tremendous challenges when it comes to building effective and usable cross-device experiences. In this workshop, participants will explore these challenges through collaborative prototyping. Specifically, this workshop explores a number of design and prototyping issues such as maintaining consistency between platforms, anticipating cross-device usage, prototyping testable cross-device experiences, and directing user attention in cross-device interactions. By bringing together researchers, practitioners, designers and makers in an intense but reflective day of prototyping cross-device experiences, we believe this workshop will advance the development of new frameworks, tools, and techniques for designing cross-device interactions.

Author Keywords
Cross-Device Experiences; Design Issues; Design Tools

ACM Classification Keywords
H.5.2. User Interfaces – Prototyping

Background and Themes
User experience designers increasingly need to consider human activities that span multiple devices, as recent studies have shown that people often use or attempted

Schedule - AM

9:00-9:15am: Welcome, introduction of the organizers, and overview of the schedule

9:15-10:00am: Quick introductions of all participants and basic interests. Brief review of available tools and methods (e.g., paper prototyping, Weave and XDStudio tools)

10:00-10:30am: Team formulation and project setup. Teams will sketch their core concepts on flipcharts

10:30-10:45am: Coffee break, participants look at each other's flipcharts

10:45-12:00pm: Project work. Teams will sketch 1-2 storyboards and key user interactions on paper.

12:00-12:30pm: Team project initial presentations--3-min lightning talks, feedback and Q&A

to use several devices together to carry out everyday tasks (e.g., [5,7]). Devices may be used in sequence (e.g., continuing to read an article initially found on a different device) or in parallel (e.g., checking information about a movie on the phone while watching it on the TV). Yet, there are tremendous challenges when it comes to designing cross-device experiences that are useful, usable, and enjoyable. Below is some of the questions this workshop will focus on:

- How do designers respect platform-specific UI standards but also maintain consistency of the user experience across platforms?
- How do designers anticipate and design for cross-device usage, with so many potential combinations of devices and use contexts, as well as users' needs and practices varying so much?
- How might designers effectively direct the user's attention to different devices at different steps in a cross-device workflow?
- How might designers create experiences that can move across or be dynamically split between devices, or shared between users?
- How might designers leverage the spatial layout of devices as a resource for interaction design?
- How do designers rapidly prototype cross-device interactions in a way that fits existing workflows and user testing requirements?
- How might the DIS community help close the gap between design and engineering in building cross-device experiences?

This workshop will explore these design issues by bringing together researchers, designers and makers in an intense but reflective process of prototyping cross-device experiences. To facilitate this process, we as co-organizers of this workshop will provide a collaborative space where attendees can get hands-on experience with prototyping tools (e.g., Weave [3] and XDStudio [6]), physical devices, and paper prototyping materials to explore creating cross-device experiences for different usage scenarios. Though this workshop encourages participants to create interactive prototypes, participants will have the option to do paper-based prototyping, which has been shown as a valid method in exploring cross-device designs [1,4]. We will also encourage attendees to bring their own tools and equipment along with a set of stated design challenges that they would like to work on during the workshop.

Going through the process of designing and prototyping cross-device experiences in a cross-disciplinary and cross-functional team will surface differences in perspectives and assumptions, limitations of existing tools, and open questions that await us to answer. We expect this enhanced understanding of cross-device design issues to help the field develop new design guidelines, bring previously under-considered and new use cases to the discourse, and inform requirements for new technical tools.

Pre-Workshop Plans

In addition to publishing the Call for Participation on our website (www.cross-device.org) and through various HCI mailing lists, we will personally reach out to researchers in the cross-device community, design practitioners in our organizations and professional networks, and university departments that offer mobile or ubiquitous computing design classes.

Schedule - PM

12:30-2:00pm: Lunch break with team members

2:00-3:30pm: Project work. Teams will refine their paper prototypes, and if they desire, start creating interactive prototypes

3:30-3:45pm: Coffee break

3:45-5:00pm: Project work. Teams will finalize their demo script and complete the remaining elements of their prototypes for the demo.

5:00-6:00pm: Team project presentations. Teams will give scenario-based demos of the experiences they prototyped.

6:30pm-8:30pm: Informal dinner in a nearby restaurant where discussions can continue

Prospective participants will apply to the workshop via a web form where they will describe their background, expertise, area of interest, and tools/projects they want to showcase or continue working on in the workshop. We will strongly encourage prospective participants to submit a short video or other multimedia materials to introduce themselves, showcasing their tools and projects if applicable, and state a concrete set of design challenges or personal goal that they want to tackle through attending the workshop. We plan to limit the workshop to 20 attendees broken up into 5 groups, each with at least one organizer.

To make the one-day workshop a productive experience for everyone, we will start the team forming process shortly after we have sent out acceptance notifications. Specifically, we will create a closed online community where participants can view the self-introduction videos submitted by others and comment on all the potential project ideas categorized into themes. In addition, we will organize participants into teams according to topic interest as indicated in their applications, but will make sure that members of a team have a diverse skill set. We will also prepare two to three interesting cross-device scenarios such as trip planning and conference presentation, which participants may choose. Every participant should have a tentative team well in advance of the workshop. For participants who want to implement interactive prototypes during the workshop, we will host suitable services and give them access to cross-device authoring tools (e.g., Weave and XDStudio).

Workshop Structure

At the core of the workshop is hands-on project work in teams that will involve a combination of design and prototyping. The scope of the work is to produce an experience prototype [2] that shows how users might take advantage of multiple devices in a particular scenario instead of a complete application. The process of creating prototypes with which participants can showcase and reflect on will bring out key issues in cross-device design and foster discussion among participants. We also seek to foster collaboration and knowledge transfer across teams. We plan to do this by having periodic syncs and presentations so that all participants can collaborate and know what everyone is working on. We provide a tentative schedule in the sidebars.

Post-Workshop Plans

Following the workshop, we will create a poster showing the design activities in the workshop, the prototypes built by participants, and the lessons we learned. We will include a digital version on the workshop website. Furthermore, we will prepare a report overviewing the workshop activities and outcomes and share it with the community. Our plan for this is to involve workshop participants as much as possible. We will target Interactions Magazine or a similar venue to reach the wider HCI community, and chronicle the event with pictures/videos to show the progress and document the design steps and critical decisions.

Organizers

Tao Dong's current research focuses on challenges of designing and developing cross-device user interfaces. He is a User Experience Researcher at Google.

Michael Nebeling has built prototyping tools such as XDStudio for cross-device interactions. He is a Swiss

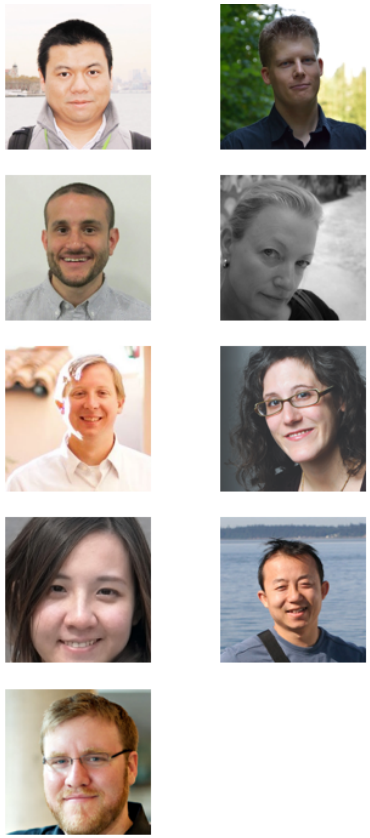

Figure 1: Organizers' Photos, from left to right: Tao Dong, Michael Nebeling, Dan Afergan, Elizabeth F. Churchill, Jeffrey Nichols, Elizabeth Goodman, Pei-Yu (Peggy) Chi, Yang Li, Daniel Wigdor.

NSF Advanced Postdoc. Mobility Fellow at the HCI Institute at Carnegie Mellon University.

Dan Afergan focuses on cross-device and adaptive interfaces. He is a Software Engineer at Google.

Elizabeth F. Churchill brings a user-experience focused lens to thinking about cross-device design. She is a Director of User Experience at Google.

Jeffrey Nichols currently leads a team exploring multi-device user interface design and development at Google, where he is a Senior Research Scientist.

Elizabeth Goodman's design practice, writing, and research investigate the consequences of ubiquitous computing and connected devices. She is a UX Lead at 18F, a design group within the US federal government.

Pei-Yu (Peggy) Chi designs the framework Weave and supportive IDE tools for scripting cross-device interactions. Peggy is a PhD candidate in Computer Science at UC Berkeley.

Yang Li is a Sr. Research Scientist at Google. He leads the Predictive User Interfaces group. He co-authored Weave, a cross-device interaction scripting framework.

Daniel Wigdor has worked in the area of mobile and multiple devices for nearly 15 years. He is an assistant professor of computer science and co-director of the Dynamic Graphics Project at the University of Toronto.

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