
New Media Collaboration through Wizard-of-Oz Simulations

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Abstract

The "Wizard of Oz" (WOz) method for supporting the evaluation of incomplete computer prototypes derives from the early days of the human-computer interaction community [5], and has subsequently been utilized by hundreds of researchers and designers to emulate technologies in interactive media systems [1,2].

Despite its popularity, we believe opportunities exist for expanding the method's use throughout an application's development and across system modules, including using multiple cooperating wizards, towards a broader range of wizard activities. Moreover, if it is applied effectively throughout an iterative design process, the WOz method can become the central point of collaboration between artists, HCI experts, and developers for creating interactive media endeavors.

We describe some of the challenges of an expanded WOz approach, and suggest that guidelines and design tools should be created to encourage the use of WOz techniques throughout the lifetime of the development cycle. We also seek to better understand how WOz simulations relate to the diverse perspectives collaborating on new media design projects.

Keywords

Wizard-of-Oz methodology, collaboration, new media, interactive computing, design research,

Introduction

One of the workshop goals is to examine and clarify disciplinary differences rising from the dissimilar traditions of artists, HCI experts, and developers. Collaborations can be challenging when various creators bring distinctive models, language, theories, and processes to the table. Likewise, the development environments for supporting the creation of new media projects often focus on the perspective of just one type of creator, providing limited support for an inherently collaborative process.

Our position is that design environments or tools can facilitate the relationship among diverse perspectives. We do not advocate a unified model for the creation process, but rather, a re-conceptualization of design tools and methods to account for diverse practices. To provide adhesion, we believe tools structured around Wizard-of-Oz (WOz) simulations can allow artists, HCI experts, and developers to work in parallel, and collaboratively, in constructive and meaningful ways.

The Wizard-of-Oz method is the practice of using hidden operators to temporarily emulate unfinished parts of a computing system during development [1,2,5]. Although this method dates back to the first days of the HCI tradition, we believe WOz studies can provide scaffolding throughout a design process for a variety of perspectives collaborating on complex new media endeavors. By maintaining an “always operational” system operated by one or multiple wizards, different modules and technologies can be formally or informally tested and critiqued at any time with potential users or members of the team. After the storyboards or sketches are first moved into digital form, we believe the development tools should make it

easy to maintain the system as a constantly evolving artifact propped up with an assortment of wizards.

Our position paper calls for an expanded WOz approach and illustrates the potential this provides for bridging disciplines. We describe our experiences with new media and WOz, highlight the prospects and problems for fully utilizing the WOz method, and raise questions for the workshop discussion.

Prior Experience

Our ideas for an expanded WOz approach are informed by years of creating and using non-trivial WOz interfaces to evaluate complex media experiences, and through in-depth reflection on the place of WOz studies in interactive system design and evaluation. In early work with colleagues and students in Computing and in the Center for New Media at Georgia Tech, our group has created numerous augmented and mixed reality experiences [2,3,6] and sought to support creators using this medium by developing the Designer’s Augmented Reality Toolkit, DART [7].

For example, our group created a location-based audio tour of historic Oakland Cemetery in Atlanta [2]. For this experience we exploited the WOz method throughout three phases of development, using a wizard for a variety of roles, from directly controlling audio segments presented to the participants to supervising a mostly complete interaction. Our reflections on the design process and our use of the WOz method led to specific changes in DART, including support for data capture and visualization of WOz simulations [2]. More recently, we used a wizard to facilitate our AR Façade experience [3] and realized that some wizard tasks are too cognitively and

perceptually challenging for one person. We should not only think about how WOz can be utilized across time in an iterative process, but how they can be distributed across multiple wizards and multiple system modules.

Prospects for Collaboration

Our vision for expanded use of WOz studies in the design and development process seeks to understand the relationship between artists/designers, HCI experts, and system developers. Much like the production process for modern films, the creation of innovative, interactive media experiences will require the collaboration of diverse individuals each with specific practices and needs. We suggest that an approach hinged on the WOz method speaks to these audiences.

For artists, an “always operational” system can provide a consistent canvas for generating and inserting media elements. In more traditional media, such as the web, a platform already exists for viewing one’s work (the web browser), allowing for constant critique and self-reflective practice. However, novel interactive media often require a mostly engineered system before an artist can “fine-tune” her work. An interactive system supported by wizard scaffolding may enable an artist to progress from early-stage sketch ideas to finished media within a skeletal interactive interface, in parallel with the work done by technical collaborators.

For HCI experts, WOz simulations directly inform the design and evaluation of human-computer interactions. By adopting an expanded notion of WOz, to be utilized throughout a design process and across multiple wizards and multiple technologies, HCI practitioners can think beyond usual limitations of technology and scale when exploring questions of usefulness and

usability. HCI experts can focus on optimizing WOz studies during a development process, asking the right questions of potential users, inserting wizards at various levels of control as necessary to mimic the fully functional system, and understanding the effects of wizard performance on the user experience. The WOz approach is agnostic in terms of a specific evaluation method, allowing HCI experts to assess human-computing systems, formally or informally, qualitatively and quantitatively.

For developers, the results of WOz studies provide a roadmap for how to develop a system. Early WOz simulations may only require a minimal system with one or multiple wizards emulating future software modules. This distributed cognitive system [4] implies a technical structure to be redistributed over time, shifting responsibility from human wizards to developed software. Developers essentially “fill-in” for wizards as the collaboration proceeds. Speculatively, we posit that the analysis of wizard action data can explicitly inform software developers’ requirements gathering process.

Challenges for an Expanded WOz Approach

While we support the notion of an expanded WOz approach in interactive system design, we foresee a number of challenges.

Creating WOz interfaces can be difficult; particularly those that can be maintained and kept functional as the application evolves. Because of their complexity, WOz interfaces are not conceived as being part of the main application, nor designed to integrate cleanly with other application modules as they evolve through a design cycle. Since, development tools do not generally include explicit support for WOz, it can be extremely

difficult to tack on WOz interfaces into a system. At the same time, such interfaces must be possible with relatively minimal effort or the WOz method will not be used, especially since the effort to create WOz code is typically seen as an additional cost above and beyond the development of the application itself.

Designers and researchers often spend little effort designing wizard interfaces, leading to cognitively and perceptually overloaded wizard operators. Inconsistent, mistimed, or inaccurate wizard performance can have a negative impact on the WOz evaluation and the actual application being created. Similarly, due to time constraints and the designer's attention on the user experience, the wizards themselves are rarely the focus of scrutiny, but their experience *should* be evaluated if the outcomes of the tests are to be trusted.

We are compelled to provide guidelines and tools to help designers realize the potential, and avoid the pitfalls, of the WOz technique. The workshop will provide an opportunity to get feedback on our vision for an expanded WOz approach, and ideally, help us discover ways to deal with the challenges.

Discussion Questions

We hope our position paper sparks discussion about the role of Wizard-of-Oz studies in new media design and development. The diverse group of workshop participants will undoubtedly have interesting perspectives on the following questions:

- Can WOz serve as *the* central hook for designing and evaluating new media? How does WOz relate to the practices of artists, HCI experts, and developers throughout a project?
- In general, does evaluation inhibit the development process and creativity? Is WOz simulation useful for informal design critiques?
- What is necessary to enable WOz to play a more significant role throughout iterative design for complex systems? What can and cannot be simulated with WOz?
- How can multiple wizards collaborate during simulation and how might this evolve over many phases of a project?

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