Conversational UX Design

Robert J. Moore
IBM Research-Almaden
San Jose, CA 95120, USA
rjmoore@us.ibm.com

Raphael Arar
IBM Research-Almaden
San Jose, CA 95120, USA
rarar@us.ibm.com

Guang-Jie Ren
IBM Research-Almaden
San Jose, CA 95120, USA
gren@us.ibm.com

Margaret H. Szymanski
IBM Research-Almaden
San Jose, CA 95120, USA
pegszymanski@hotmail.com

Abstract

From Siri to Alexa to Cortana, conversational interfaces are hitting the mainstream and becoming ubiquitous in our daily lives. However, user experiences with such applications remain disappointing. Although it is easy to get a system to produce words, none of the current agents or bots display general conversational competence. Modeling natural conversation is still a hard problem. But in order to tackle it, conversational UX designers must possess a technical understanding of the structures of natural conversation. This workshop explores the intersection of user interface design and the design of natural conversation. It seeks to outline principles and guidelines for Conversational UX Design as a distinct discipline. *Workshop participants will get their hands dirty building conversation flows.*

Author Keywords

Conversational systems; virtual agents; chat bots; UX design; interaction design; conversation analysis; ethnomethodology

ACM Classification Keywords

H.5.2. Information interfaces and presentation (e.g., HCI): User Interfaces.
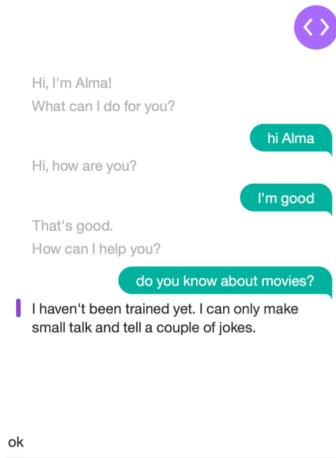
Figure 1: Example of a simple conversational interface

Background

While virtual agents and chat bots have been around for decades [1], there has been a recent resurgence of interest in them as major computer companies have released their own. Apple's Siri, Google's Assistant, Microsoft's Cortana, Amazon's Alexa, Facebook's M and IBM's Watson are just a few examples, not counting conversational agents by startups.

With persistent Internet connections and statistical algorithms, virtual agents are much smarter today than they were 20 years ago. While most of these systems accept voice input from users, a growing number accept text input, sometimes from standard applications like SMS and Instant Messaging. But although today's virtual agents are often touted as "easy to build," interactions with them are still awkward, confusing, limited and fraught with troubles in mutual understanding.

Conversational interfaces are very different from graphical user interfaces. In conversational interfaces, the graphical elements are generally minimal, for example, a chat history and text box or microphone button (Figure 1) or nothing at all. User interaction is conducted primarily through the words: typed or spoken. The interaction metaphor for these interfaces is the natural, human conversation.

Although natural language processing has given us powerful, automated tools for analyzing the spoken and the written word alike, it does not provide a model of how bits of language are sequenced by multiple parties into an interaction that is recognizable as a "conversation" [3]. Natural human conversation is a complex system [7,3], which Harvey Sacks called a

"machinery" in its own right [6]. How to create a user interface that mimics features of such a machinery is nontrivial. But rather than avoiding this complexity by producing simplistic interactions, we should embrace the complexity of conversational systems because it "mirrors the complexity of the world," while at the same time avoiding any complexity that is due instead to "poor design" [4].

The time is ripe for developing Conversational UX Design as a distinct discipline. Just as graphical user interfaces improved dramatically as visual artists became involved in development (1990s-2000s), so will conversational interfaces when conversation experts get involved. Rather than a background in the visual arts, conversation experts possess a background in the study natural conversation, for example, in the fields of sociology, communication, linguistics, psychology, etc. Conversation Analysis, in particular, offers over 50 years worth of rich, empirical studies of naturally occurring talk-in-interaction in a wide range of settings and languages, which offer formal, qualitative models of how natural conversation is structured. While the proposal to apply these findings to the design of dialogue interfaces may not be entirely new [1,5], it has become especially timely as new conversational technology platforms are becoming ubiquitous.

Conversation experts are keen observers of natural conversation and can articulate the mechanics of human conversation, which most others know only tacitly. For example, a conversation expert may describe the function of the word "oh" to mark speakers' realizations [2] or how the phrase, "to the what?," in response to "I'm going to the workshop," elegantly elicits a repeat of a single word "workshop"

[8]. Conversational UX designers use such observations of the machinery of human conversation in building conversational machines.

The goals of this workshop are to explore the intersection of UX design and the analysis of natural, human conversation in the context of text- or voice-based virtual agents and to begin to define a set of design principles and guidelines for today's conversational platforms.

Organizers

Robert J. Moore is an ethnomethodologist and conversation analyst who has been applying these disciplines to technology design for over 15 years in Silicon Valley (at Xerox PARC, Yahoo! and IBM). Over the past 2 years, he has been translating formal models from Conversation Analysis into conversation flows for virtual agent systems at IBM Research-Almaden.

Raphael Arar is an award-winning designer, artist and educator. In his role as Designer and Researcher at IBM Research, he focuses on the intersection of cognitive computing and design methodologies, and as a Lecturer at the University of Southern California in their Media Arts + Practice Division, he is passionate about bringing design and technology to the academic space.

Guang-Jie Ren is a Research Staff Member at IBM Research-Almaden. He leads the re*THINK Enterprise team with a passion in creating user-centric innovations to address industry challenges. Guang-Jie currently leads a project building conversational applications for the travel and transportation industry.

Margaret "Peggy" Szymanski is a conversation analyst and ethnographer who has recently joined IBM Research-Almaden and has spent 16 years at the Xerox's Palo Alto Research Center (PARC). She applies Conversation Analysis to talk and work practice in diverse settings, as well to the design of social, mobile and communications technologies.

Workshop Website

More information on the workshop can be found here: http://researcher.watson.ibm.com/researcher/view_group.php?id=7539

Pre-Workshop Plans

Prior to the workshop, participants are asked to write a 2-4 page position paper, which outlines their views of the workshop topics and the reasons they are interested in the area of Conversational UX Design. In addition, they should set up a platform of their choice for building conversation flows. If they do not already prefer one, participants may use the IBM Watson Conversation Service for free: console.ng.bluemix.net/catalog/services/conversation.

Workshop Structure & Topics

The workshop will consist of 3 parts: short talks, build session and design principles & guidelines.

1) Short Talks

Participants will give short talks or lead discussions on the following workshop topics or related topics:

a. **Usability of conversational interfaces** – What works well in conversational interfaces (e.g., Siri, Alexa, Cortana) from a user perspective? What

works poorly? What are the existing design principles and best practices?

b. **Design and creation of conversational interfaces** – How do you design and build conversation flows? How do the main parts of a conversation flow (e.g., intents/actions, entities, conditions, context variables, system responses, etc.) work? What makes this hard?

c. **Design of natural human conversation** – How are naturally occurring human conversations structured? How do speakers design particular turns-at-talk? What are the fundamental structures of human conversation and social action?

d. **Voice or Text?** – When should you use voice vs. text? What are the trade-offs in using each? What are the technical challenges with automatic speech recognition, and how can they be addressed?

e. **Conversational UX & Other Interfaces** – How do you incorporate chat with other interface paradigms (i.e., conventional GUIs, AR/VR)? How can designers envision conversation working in tandem with existing platforms?

f. **Overview of platforms** – What platforms are currently available for building conversational interfaces? What features are standard across them? What are the advantages of some over others?

g. **Capturing User Feedback** – How do designers learn from initial releases of conversational interfaces? What data and techniques should designers leverage when iterating? What are the best performance metrics?

h. **Conversation Design Notation** – How can conversational UX designers represent their designs at a level of abstraction? How can they share designs amongst themselves and across platforms? What might a notation system for representing conversation flows look like?

If you have another topic that is closely related to the usability or design of conversational interfaces, feel free to propose it.

Note: the use of empirical data/transcripts of actual conversations, human-computer or human-human alike, as well as conversational demos, is highly encouraged. Thinking at the level of sequences of turns-at-talk/text will greatly benefit the participants in the next section of the workshop.

2) Build session
After discussing challenges in conversation design, participants will break out into groups of 3-5 to build components of conversation flows. Participants may use their preferred platform. The organizers can also provide guidance in using the free IBM Watson Conversation Service.[1] Builds should attempt novel solutions to common problems in conversation design, such as, system fails to match any input, system matches input with low confidence, user lacks key information, user fails to understand output, user does out-of-scope or off-domain action, user abandons a request or the app entirely, etc. *Participants are strongly encouraged to seek solutions in the designs of the utterances themselves rather than in non-verbal, visual resources.* Groups will then reconvene and share

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[1] Setting up an account on the IBM Watson Conversation Service https://console.ng.bluemix.net/catalog/services/conversation or other platform *before the workshop* will save valuable time during the workshop.

their problem and solution(s) with the rest of the workshop participants.

3) Design Principles & Guidelines
As the last task in the workshop, we will reflect on what we heard and did throughout the day and create a first draft of a set of design principles and guidelines for the burgeoning discipline of Conversational UX Design.

Post-Workshop Plans

After the workshop, the design principles and guidelines generated during the workshop will be refined and developed into a guide for conversational UX designers.

Call for Participation

The goals of this workshop are to explore the intersection of UX design and the analysis of natural, human conversation in the context of text- or voice-based virtual agents and to begin to define a set of design principles and guidelines for today's conversational platforms. In exploring this space, the participants will give short talks or lead discussions on workshop topics related to the design of conversational interfaces and will get their hands dirty building conversation flows on the platform of their choice in the break-out session.

Participants should be those with some experience 1) in the design of conversation flows for virtual agents or similar systems or 2) in the analysis of natural, human conversation and an interest in applying it to conversational interfaces.

Interested participants should submit:

- A position paper formatted in the CHI Extended Abstracts Format. It should include the name, contact information, affiliation of authors, and must be limited to 2-4 pages, including figures and references. All submissions must be in English.
- A short biography of each author's background, their interest in conversational UX design, and their motivations for participating in the workshop. Note: at least one author must attend the workshop and that all participants must register for both the workshop and for at least one day of the conference.

Submissions should be sent by email to rjmoore@us.ibm.com by 11:59 p.m. Pacific Standard Time on Friday, January 20, 2017. Submissions will be acknowledged via email. For more information, visit the workshop website:
http://researcher.watson.ibm.com/researcher/view_group.php?id=7539

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