

Human~Computer Interaction

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Lecture 6

2017

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Introduction

The use of anthropomorphism in interaction design is an effective technique and should be exploited further. A controversial debate in interaction design is whether to exploit the phenomenon of anthropomorphism (the propensity people have to attribute human qualities to objects). It is commonly exploited in the design of technologies the creation of humanlike animals and plants in cartoon films, the design of toys that have human qualities).

What is anthropomorphism?

It is well known that people readily attribute human qualities to their pets and their cars, and, conversely, are willing to accept human attributes that have been assigned by others to cartoon characters, robots, toys, and other inanimate objects. Advertisers are well aware of this phenomenon and often create humanlike characters out of inanimate objects to promote their products.

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For example, breakfast cereals, butter, and fruit drinks have all been transmogrified characters with human qualities (they move, talk, have personalities, and show emotions), enticing the viewer to buy them. Children are especially susceptible to this kind of magic, as witnessed in their love of cartoons, where all manner of inanimate objects are brought to life with humanlike qualities.

Example of its application to system Design

The finding that people, especially children, have a propensity to accepting and enjoying objects that have been given humanlike qualities has led many designers into capitalizing on it, most prevalently in the design of human-computer dialogs modeled on how humans talk to each other. A range of animated screen characters, such as agents, friends, advisors and virtual pets, have also been developed.

ActMates

Anthropomorphism has also been used in the development of cuddly toys that are embedded with computer systems. Commercial products like **ActMates** have been designed to try to encourage children to learn through playing with the cuddly toys. For example, Barney attempts to motivate play in children by using human-based speech and movement (Strommen, The toys are programmed to react to the child and make comments while watching together or working together on a computer based task

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In particular, Barney is programmed to congratulate the child whenever he or she gets a right answer and also to react to the content on screen with appropriate emotions (e.g., cheering at good news and expressing concern at bad news).



(iv) Barney, an interactive cuddly toy that makes learning enjoyable.

Arguments for exploiting this behavior

An underlying argument in favor of the anthropomorphic approach is that furnishing interactive systems with personalities and other humanlike attributes makes them more enjoyable and fun to interact with. It is also assumed that they can motivate people to carry out the tasks suggested (learning material, purchasing goods) more strongly than if they are presented in cold, abstract computer language.

For example, Being addressed in first person Hello Chris! Nice to see you again. Now what were we doing last time? Oh yes, exercise Let's start again.) is much more endearing than being addressed in the impersonal third person (User 24, commence exercise especially for children. It can make them feel more at ease and reduce their anxiety. Similarly, interacting with screen characters like tutors and wizards can be much pleasanter than interacting with a cold dialog box or blinking cursor on a blank screen.



Evidence for motion

A number of studies have investigated people's reactions and responses to computers that have been designed to be more humanlike. body of work reported by Reeves and Nass (1996) has identified several benefits of the anthropomorphic approach. They found that computers that were designed to flatter and praise users when they did something right had a positive impact on how they felt about themselves. For example, an educational program was designed to say, Your question makes an interesting and useful distinction. Great job! after a user had contributed a new question to it

5.6 Virtual Characters: agents

As mentioned in the debate above, a whole new genre of cartoon and life-like characters has begun appearing on our computer screens as agents to help us search the web, as e-commerce assistants that give us information about products, as characters in video games, as learning companions or instructors in educational programs, and many more.

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The best known are videogame stars like Lara Croft and Super Mario. Other kinds include virtual pop stars, virtual talk-show hosts, virtual bartenders, virtual shop assistants, and virtual newscasters. Interactive pets (Aibo) and other artificial anthropomorphized characters (Pokemon, Creatures) that are intended to be cared for and played with by their owners have also proved highly popular.

5.6.1 Kinds of agents

Below we categorize the different kinds of agents in terms of the degree to which they anthropomorphize and the kind of human or animal qualities they emulate. These are (1) synthetic characters, (2) animated agents, (3) emotional agents, and (4) embodied conversational interface agents.

1~ Synthetic Characters

These are commonly designed as 3D characters in video games or other forms of entertainment, and can appear as first-person avatar or a third-person agent. Much effort goes into designing them to be lifelike, exhibiting realistic human movements, like walking and running, and having distinct personalities and traits. The design of the characters' appearance, their facial expressions, and how their lips move when talking are also considered important interface design concerns. Silas T. Dog is like cartoon creature and behave like a real dog.

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For example, he can walk, run, sit, wag his tail, bark, cock his leg, chase sticks, and rub his head on people when he is happy.

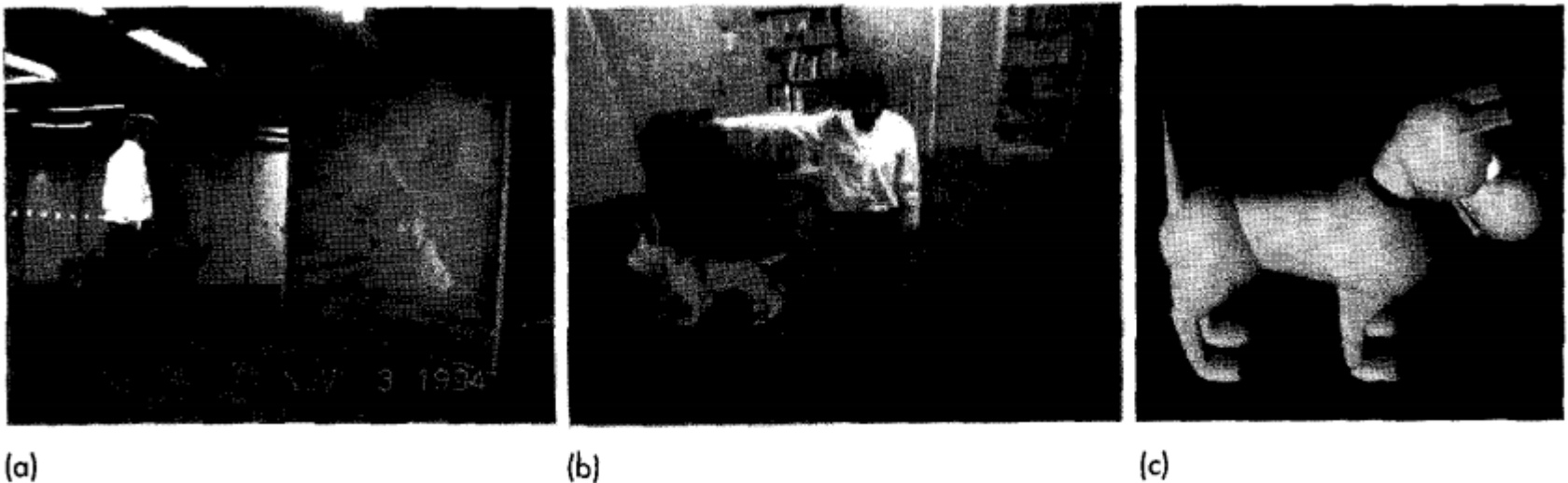


Figure 5.10 User interacting with Silas the dog in (a) physical world (b) virtual world, and (c) close-up of Silas.

2~Animate agents

These are similar to synthetic characters except they tend to be designed to play a collaborating role at the interface. Typically, they appear at the side of the screen as tutors, wizards and helpers intended to help users perform a task. This might be designing a presentation, writing an essay or learning about a topic. Most of the characters are designed to be cartoon-like rather than resemble human beings. An example of an animated agent is Herman the Bug. It is talkative, quirky insect that flies around the screen and dives into plant structures as it provides solving advice to students



Its behavior includes **30** animated segments, canned audio clips, of songs. Herman offers advice on how to perform tasks and also tries to motivate students to do them.

3~Emotional agents

These are designed with a predefined personality and set of emotions that are manipulated by users. The aim is to allow people to change the moods or emotions of agents and see what effect it has on their behavior. Various mood changers are provided at the interface in the form of sliders and icons. The effect of requesting an animated agent to become very happy, sad, or grumpy is seen through changes to their behavior. For example, if a user moves a slider to a scared position on an emotional scale, the agent starts behaving scared, hiding behind objects and making frightened facial expressions.



Figure 5.12 The Woggles interface, with icons and slider bars representing emotions, speech and actions.

4. Embodied conversational interface agents

Much of the research on embodied conversational interface agents has been concerned with how to emulate human conversation. has included modeling various conversational mechanisms such as:

- recognizing and responding to verbal and non-verbal input
- generating verbal and non-verbal output
- coping with breakdowns, turn-taking and other conversational mechanisms
- giving signals that indicate the state of the conversation as well as contributing new suggestions for the dialog

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In many ways, this approach is the most anthropomorphic in its aims of all the agent research and development. Rea is an embodied real-estate agent with a humanlike body that she uses in humanlike ways during a conversation (Cassell, 2000). In particular, she uses eye gaze, body posture, hand gestures, and facial expressions while talking. Although the dialog appears relatively simple, it involves a sophisticated underlying of conversational mechanisms and gesture-recognition techniques.

Activity 5.4 :
Which of the various kinds of agents described above do you think are the most convincing?
Is it those that try to be as humanlike as possible or those that are designed to be simple, cartoon based animated characters?



Figure 5.13 Rea the real estate agent welcoming the user to look at a condo.

5.6.2 General design concerns

1- Believability virtual characters

One of the major concerns when designing agents and virtual characters is how to make them believable. By believability is meant the extent to which users interacting with an agent come to believe that it has its own beliefs, desires and personality (Lester and Stone, 1997, p 17).

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This requires deciding what are appropriate behaviors (jumping, smiling, sitting, raising arms) for different kinds of emotions and moods. How should the emotion very happy be expressed? Through a character jumping up and down with a big grin on its face?

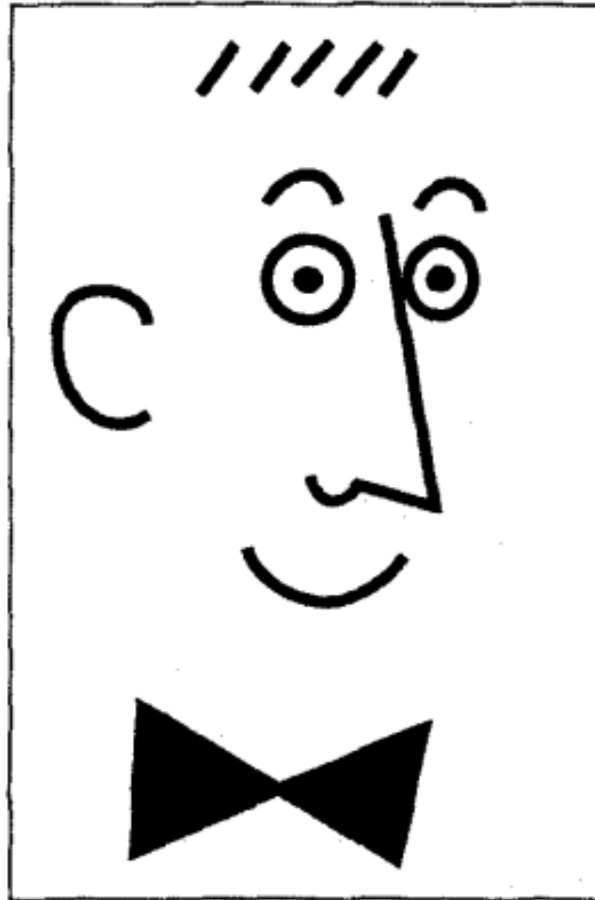
2~Appearance

The appearance of an agent is very important in making it believable. Parsimony and simplicity are key. Research findings suggest that people tend to prefer simple cartoon-based screen characters to detailed images that try to resemble the human form as much as possible (Scaife and Rogers, 2001). **Other research has also found that simple cartoon-like figures are preferable to real people pretending to be artificial agents.**

Project carried out by researchers at Apple Computer Inc. in the 80s found that people reacted quite differently to different representations of the same interface agent. The agent in question, called Phil, was created as part of a promotional video called “The Knowledge Navigator”.



(a)



(b)

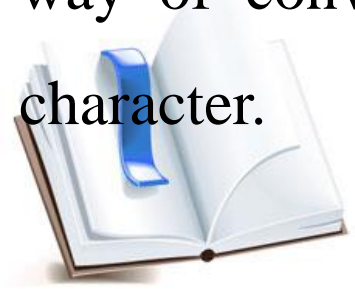
Figure 5.14 Two versions of Phil, the agent assistant that appeared in Apple's promotional video called the Knowledge Navigator (a) as a real actor pretending to be a computer agent and (b) as a cartoon being an agent. Phil was created by Doris Mitsch and the actor Phil was Scott Freeman. 27

3~Behavior

Another important consideration in making virtual characters believable is how convincing their behavior is when performing actions. In particular, how good are they at pointing out relevant objects on the screen to the user, so that the user knows what they are referring to? One way of achieving this is for the virtual character to lead with its eyes. For example, the dog turns to look at an object or a person before he actually walks over to it to pick the object up or to invite the person to play). A character that does not lead with its eyes looks very mechanical and as such not very life like (Maes, 1995).

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As mentioned previously, agent's actions need also to match their underlying emotional state. If the agent is meant to be angry, then its body posture, movements, and facial expression all need to be integrated to show this. How this can be achieved effectively can be learned from animators, who have a long tradition in this field. For example, one of their techniques is to greatly exaggerate expressions and movements as a way of conveying and drawing attention to an emotional state of a character.



4~Mode interaction

The way the character communicates with the user is also important. One approach has been towards emulating human conversations as much as possible to make the character's way of talking more convincing. However, as mentioned in the debate above, a drawback of this kind of masquerading is that people can get annoyed easily and feel cheated.

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Paradoxically, a more believable and acceptable dialog with a virtual character may prove to be one that is based on a simple mode of interaction, in which prerecorded speech is played at certain choice points in the interaction and the user's responses are limited to selecting menu options. The reason why this mode of interaction may ultimately prove more effective is because the user is in a better position to understand what the agent is capable of doing. There is no pretence of a stupid agent pretending to be a smart human.

Thank You

