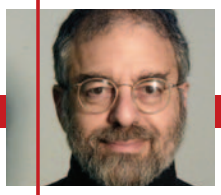

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CHI at the Movies and on TV

Can you remember the first science fiction movie you ever saw? What about the first science fiction program you ever saw on television? Can you remember what you thought about the user-interface design or user experience of any computer-based telecommunication system presented in these shows? And what about today? Do you cast a critical eye on the technology and its use whenever you watch the latest movie or video presentation about a world of the future?

I thought about these questions as I contemplated my own earliest memories. I am not the most dedicated sci-fi junkie, but I have been interested in visions of future worlds since I was small kid growing up in Omaha, Nebraska, more than half a century ago. Back then, I feasted on Marvel's *Weird Science Fantasy* comic books, *If* and *Galaxy* science fiction pulp magazines, and Ace double-novel science fiction softcover books (which had a front cover on each end of the book and half of the book printed upside down). It was also during this time that I discovered H.G. Wells's *War of the Worlds* and *1984*. Television was in its first decade and featured *Captain Video* and *Tom Corbett, Space Cadet*. Even then Buck Rogers had been featured in movies and appeared on television. Heroes and villains occasionally spoke to and from wall-mounted flat-video displays, although most of the communication took place with desktop microphones and the occasional loud speaker. Control panels consisted of elaborate dials and gauges. I remember during the days of live television when one of Captain Video's co-pilots accidentally knocked over the entire control panel (which probably consisted mostly of cardboard coated in metallic spray paint) and the entire desk-size apparatus fell over from the wall of their spaceship. Captain Video deftly picked it up and commented, "Luckily no wires were broken, Steve" (or whatever his copilot was named), then continued on with the show, as if nothing had happened.

These early experiences with *images* of future technology must have influenced my own early interest in user-interface design because when I was about ten years old, I built a "rocket-ship control panel" in the basement of my house, complete with blinking lights, plus dials, gauges, and clicking knobs salvaged from old radios, my father's odds and ends, or local trashcan treasures. I don't recall thinking about usability in my design; I focused more on the emotional impact of blinking lights. With this "sophisticated apparatus," my brother and I could make fantasy trips to distant planets and communicate with extra-terrestrials, at least in our imaginary use scenarios.

MOVIES AND TELEVISION, A 50-YEAR RUN

The earliest science fiction movie was George Méliès's 1902 *Le Voyage Dans la Lune*. This magician-turned-filmmaker introduced innovative special effects: disappearances, double exposures, other photographic tricks, and elaborate sets. However, his user-interface innovation was modest. Most of us working now probably first encountered the images of computer-human interaction and communication as it was imagined in the science fiction movies of the '40s, '50s, '60s, '70s, and '80s, depending on when we got started, as people and professionals. The experience growing up with television and computer games has been quite different for more recent generations.

For many past decades, Hollywood, which generated a majority of the science fiction fantasies of CHI, HCI, UI, UX, or whatever you might call it, often seemed somewhat timid about showing advances in communication/interaction. I do recall everyone marveling in 1968 that AT&T Picturephones had become a reality by 2001 (that was only one of the overly optimistic estimates of future progress). Later, we would look in awe at Star Trek's communicators while marveling at the lapel-pin-based *verbal* communication with the main computer systems.

Throughout the decades, the background technology would change and slowly upgrade. In the 1950s and '60s, twirling double magnetic tape reels and meaningless arrays of blinking lights were the metaphor for computer power. The lights became more and more sophisticated over the decades, but the communication media remained essentially the same. The *Star Wars* series beginning in 1976 innovated by making everything gritty and somewhat broken down, unlike the clean machines of *2001: A Space Odyssey*. The control panels harkened back to earlier times by making some of the rocket-fighter stations reminiscent of World War II aircraft cockpits, much as the action itself was modeled on movie versions of WWII aircraft battles. Likewise for the *Matrix* series, which relied upon somewhat clunky old battle-station controls, the kind that were satirized effectively in *Brazil* (one of my favorite romantic but frightening views of the future). Even Ridley Scott's eerie view of Los Angeles in *Blade Runner* showed essentially the same old urban displays, albeit larger, crustier, and more depressing than ever. One of the major visualization innovations was *Tron*, which didn't innovate so much in handheld communication devices as it did in trying to envision software environments themselves.

Only in the past decade have some notably different visions emerged, perhaps because some set designers have hung around SIGGRAPH and SIGCHI conferences long enough, or because SIGCHI consultants are actually working with the movie and video production teams to provide new concepts.

In terms of new approaches, I am reminded of Tom Cruise dancing with data in *Minority Report*, of advertisements following his movements and directing targeted commercial announcements directly to him as he flees through a future cityscape. Here represented are interaction and environmental graphics that seemed thoughtful responses to what technology could deliver in the 21st century, not the 20th. These seem related to the transparent user interfaces of the recent television series *Farscape*, which also emphasizes more virtual than concrete physical equipment.

One exotic, memorable innovation in equipment was *eXistenZ*, a 1999 sci-fi crime thriller set inside a virtual-reality game world. Besides the innovative game-within-a-game-within-a-game premise of the movie, one of the more striking creations of this film seemed to be the organic devices that looked like mutant protoplasm combined with some metallic components. For example, a gun might look partly like a dead chicken leg, partly like fungus, and maybe a little like a traditional lethal device.

In the recent *AeonFlux*, we finally see ubiquitous computing products appear, like computation and communication built into clothing. One of the key figures actually talks into his sleeve, which lights up gently to let us know what is happening. At least he doesn't talk into his shoe like Don Adams as Maxwell Smart in the *Get Smart* series from 1968-70. In another *AeonFlux* scene, characters ingest tiny bits of chemical or mechanical substances (nano-pills?) that enable them to communicate with other beings once the substances are absorbed. In another scene, a character's ear lights up and we are thereby informed that the communication devices have been built into the ear itself. These are considerably more exotic visions of hardware and software than many contemporary films and videos.

Today, there are vast resources on the Internet and in print concerning the history of movies and video, specifically for the subject of science fiction. Amazon lists 1400 entries for sci-fi movies and 2200 entries for sci-fi television. However, most of these deal with the actors and actresses, the story lines, the directors and producers, even the locations. Almost none of these resources focuses on the human-computer and the computer-mediated human-human communication and interaction of these works. Extreme details abound, like those of the Internet Movie Database and the data collections of the American Film Institute. However, the history of user-interface design in movies and television, specifically in the science fiction genre, remains to be collected, researched, analyzed, and made available. This subject will, I hope, be a subject for future books, Internet offerings, and university course offerings, to say nothing of CHI and sci-fi conferences.

CONCLUSION

As some of you may recall, I organized two CHI panels, called "Sci-Fi at CHI," to which I invited leading science fiction writers to comment on what the future held in store for human-computer interaction and communication. I remember Bruce Sterling's typically outrageous and funny remarks about the future, in which he imagined that the ubiquitous computing and communication device of the future would look like a handkerchief that could copy anything it was placed over, could present whatever images or sounds one wished, and could connect to the Internet to provide all possible communication and computation support.

Hollywood is typically several generations behind the latest actual achievements of technology. Movies and television have the challenge of making hard-to-imagine scenarios make sense to people who often cannot imagine the full power of user-interface innovation and creativity harnessed to human-computer and human-human communication and interaction. Perhaps the CHI community could help educate the film and television community more effectively.

One recent collaboration is that of Alexander Singer, a Los Angeles film director who worked on Star Trek, with scientists and engineers to produce a short film sponsored by DARPA about augmented cognition. The film features elaborate scenarios using special headsets that can scan the user's brain and detect overload of certain regions, then shift the information media mix, say, from verbal to visual or from visual to acoustic, to enable the human being to think better. This represents a significant new direction for user-interface flexibility, somewhat reminiscent of the Japan Friend21 project in the late '80s and early '90s, which was reported on at CHI 1994. In that project, the researchers experimented with metaphor-management software that would change the entire paradigm of information display, in that case per user preference, not because some meta-system had determined that the users were having cognitive or emotional overload.

By studying the film and video representations of past decades, we may not only gain a better under-

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THE WAY I SEE IT

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provide graceful movement, flowing screens, semitransparent overlays, subtle colors: These are all components of the engaging interfaces. Are these the components that make them so compelling? Or is there something else?

Finally, we are moving from static pages to dynamic displays, where the movement is a major part of the charm.

I'd like to see this studied through controlled experiments with valid behavioral and subjective measures. Meanwhile, while waiting for the science to reveal the secrets, there is a mad rush of developers, all anxious to explore Rich Internet technologies, all anxious to add movement and overlays to their pages. We've seen this type of overenthusiasm before, so be prepared to go through a phase where everything shimmers, where panels shrink and expand, where you will never know whether to left click, right click, or center click (even for those with a one-button mouse). Some objects will have to be dragged and dropped, others waved over while saying a mystical chant. But the end result of this experimentation should be a richer, far more engaging Internet.

We are moving from static pages with their clunky, slow repainting of the page to fluid, dynamic displays, where the movement is a major part of the charm. We are moving from behaviorally effective designs to ones that add emotional engagement. ✦

Disclaimer for this article: Microsoft, Macromedia, and Google are or have been clients of the Nielsen Norman Group. Yahoo! once bought me dinner.

FAST FORWARD

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standing of past illusions and delusions, but we might gain a better understanding of how to present new concepts to the general public and bring them up to date on the future of human-computer interaction and communication. ✦

URLs

The following is merely a starter kit of Web sites devoted to the individual offerings or analyses of them:

A Bibliography of Science Fiction in Film and Television
www.geocities.com/Hollywood/Lot/2976/SF2-crit.html

Science Fiction entry in Wikipedia
http://en.wikipedia.org/wiki/Science_fiction_film

Timeline of Influential Milestones and Important Turning Points in Film History, Tim Dirks
www.filmsite.org/milestones1900s.html

Internet Movie Database
www.imdb.com

Museum of Television
www.museum.tv

The Future of Augmented Cognition*, an Alexander Singer Film showcasing techniques soon to be improving performance on an exponential level everywhere*
http://interactive.usc.edu/members/sfisher/archives/2005/09/im_forum_speake_2.html

ON THE EDGE

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of the MobiTip system compared with other similar recommender systems is that it requires no infrastructure and runs on commercially available devices, and therefore it was possible to release it for testing in a local shopping mall.

Another example of local interaction is the Future Application Lab's Push!Music. What would happen if the songs on your iPod had a mind of their own? In Push!Music, all MP3 files are "media agents" that observe the music-listening behavior of the user and other people in the vicinity. The songs are free to move between devices that are connected in a wireless network, which means that a song can "jump" from one player to another, where it thinks it would be appreciated. For instance, after taking the bus to work, you might discover that several new songs have appeared on your player-and if the algorithm is good enough, chances are that you will even like them! The project raises many questions of security and intellectual property, and to be viable it will also need a robust payment model, either as a subscription service or using one of several emerging peer-to-peer payment systems.

In face-to-face interaction we can use a multitude of means to express feelings and attitudes, such as facial expression, body posture, and tone of voice. An SMS message on a mobile phone, on the other hand, has to be composed using a keypad, can only contain 160 characters, and in general does a very bad job of catching the nuances of human communication. The eMoto project by the Involve group extends the possibilities of mobile messaging by adding an emotional component. By shaking, squeezing, and otherwise mistreating the phone's stylus after you have written a message, you generate a colorful background pattern that expresses the emotion you want to put across. The stylus contains sensors to catch movement and pressure, and the interaction model is based on a psychological model of emotion as well as the emotional value of colors and shapes.

Those who still worry about the "limited" interaction possibilities of mobile devices should note that all the applications mentioned above could be used on a standard mobile phone today (with small modifications). Yet at the same time they drastically expand the interaction parameters of mobile devices by taking advantage of local interaction, observations of the user's behavior, physical input, and so on. Although the computers we interact with in the future may look like the mobile phones of today, they should be much more than that. Only when interaction designers and researchers acknowledge this will they make applications and services that are not just mobile computers, but a natural part of mobile life. ✦

LINKS

The Mobile Life project
www.mobile-life.org

Mobile Life brochure
www.mobile-life.org/mobilelife.pdf

MobiTip
www.sics.se/humle/projects/mobitip

Push!Music
www.viktoria.se/fal/projects/music

eMoto
www.sics.se/~petra/eMoto