World of Bots

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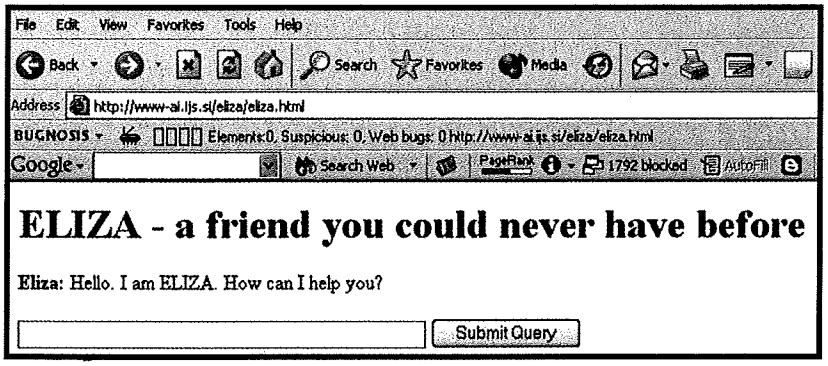
He suspects that the Librarian may be pulling his leg, playing him for a fool. But he knows that the Librarian, however convincingly rendered he may be, is just a piece of software and cannot actually do such things.
(Stephenson, 1993)

In Neal Stephenson's novel *Snow Crash,* the protagonist uses a virtual librarian in "The Library" located in his virtual home to answer reference questions and retrieve information for him. While this is in the realm of science fiction, technology is getting closer to such a reality in the form of bots. The word "bot" is derived from "robot." Whereas a robot is a physical machine, a bot is defined as "a computer application mimicking or embodying elements of human intellect." (Smith, 2002) There are a number of different types of bots, such as search bots, tracking bots, shopping bots, etc. A chatterbot consists of a textbox for user input. The bot always gives a text response and sometimes a synthesized vocal response. Many of the chatterbots use animation to appear more life-like.

Bots represent a branch of research in Artificial Intelligence (AI). An early attempt to mimic intelligence is ELIZA. (Weizenbaum, 1966) It was designed to act as a virtual therapist, and ELIZA is now considered an archaic "chatterbot." There are several Web-based versions of ELIZA and one such incarnation is http://www-ai.ijs.si/eliza/eliza.html.



It seems more primitive compared to the other chatterbots. A downloadable version called Elizabeth is also freely available for educational use at http://www.etext.leeds.ac.uk/elizabeth/. A program like this would be a better choice for experimentation on just a desktop computer.

In the context of the library, the types of bots used are known as "knowledge agents," software that sifts through data to retrieve answers to questions. (Moore, 2004) A few libraries have used these bots to help answer the types of questions often asked in libraries such as directions and hours. For example, the National Library of Medicine has had success with a bot named "Cosmo," which provides answers to patron's basic questions. Cosmo is a type of a chatterbot.

Available 24/7 Cosmo (http://wwwns.nlm.nih.gov/) consists of a textbox and "Enter" button.

Ask Cosmo about NLM.
24 hours a day, 7 days a week

Asking a question gives a response and usually some hyperlinks to click. If you ask it about hours, it gives you three links for schedules and hours. If you ask it where the bathroom is, it tells you that it is designed to answer questions about the library and to see its job description. If you ask it who made it, it tells you:

> Adam Glazer is a librarian at the National Library of Medicine. He's the one who led the effort to create my scripts and make me the vRep I am today. You can contact him by e-mail to the Library at custserv@nlm.nih.gov.

Unlike some of the other bots, there is no animated character and no speech generated.

Similar to Cosmo, Cybelle (http://www.agentland.com) is a chatterbot in that you can enter text and get a text response.

However, Cybelle is animated and moves when it is "speaking." Unlike Cosmo, this agent tries to be entertaining. I asked it to tell me a story. It replied, "Generic story: Situation... characters... crisis... resolution." The Web site is a little bit difficult to navigate, and unlike Cosmo, Cybelle does not give you URLs to click when searching for items.

ALICE (Artificial Intelligence Foundation—http://www.alicebot.org/) is another chatterbot that is animated, and, unlike the others just discussed, it can speak in a synthesized voice.

If you become a registered member (there is a fee) you can get chat with a speaking (audio) bot. The intended use seems to be for ESL students to practice conversational English. You can see a vocal iteration of ALICE at http://www.pandorabots.com/pandora/talk?botid=f6d4afd83e34564d.

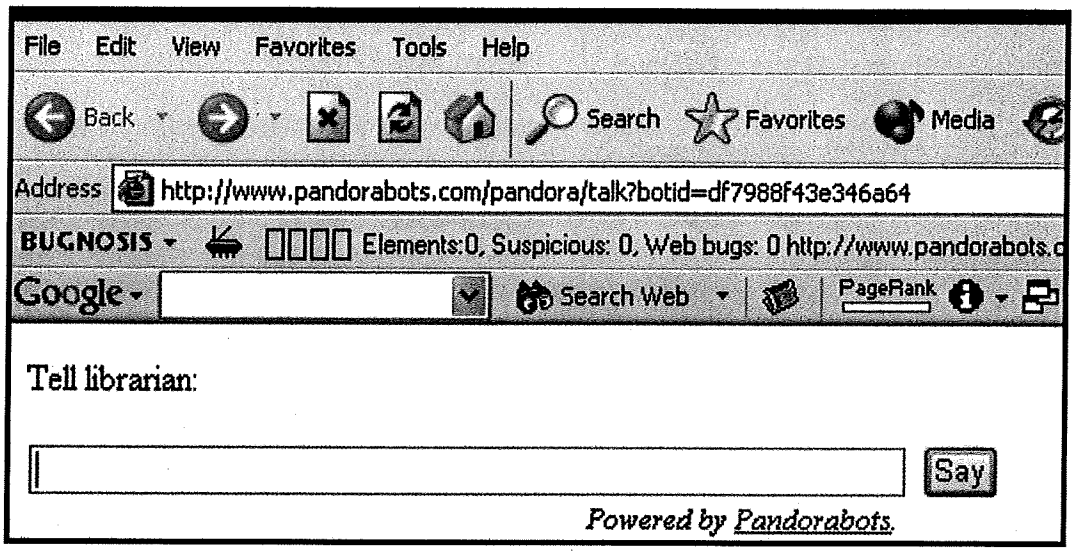
The free version of ALICE is silent. It uses the Macromedia Flash plug-in to enable the animation. It can sense where your mouse pointer is pointing and moves its head and eyes to track the movement. The ALICE Foundation makes its code available freely on the Web so that others can develop their own chatterbots. The markup language they use is called AIML. According to their Web site, AIML (Artificial Intelligence Markup Language) is an XML-compliant language that's easy to learn, and makes it possible for you to begin customizing an ALICE bot or to create one from scratch within minutes. (http://www.alicebot.org/aiml.html)

Many of the chatterbots that you'll encounter are powered by Artificial Intelligence Foundation's software. An easy way to tell is to say, "aiml," to a chatterbot and see if it responds with an explanation as to what AIML is.

Unfortunately, the software has very obscure names, such as Program D. Program D is the ALICE bot written in Java. Program E is written in PHP and works with a SQL database. Program P is the same AIML interpreter written in PASCAL. Program V is written in Perl but it requires mod_perl to work. Furthermore, one would need to know programming to implement any of these programs on his/her own Web site. Also, the download page is not very user friendly to navigate.

I asked ALICE to tell me a story. It replied,

> The relationship between Author Jessica Mitford and John Barrymore became increasingly strained. John Barrymore felt something was missing, and Author Jessica Mitford felt the relationship was flawed. John Barrymore became more and more depressed, but Author Jessica Mitford just got angry and left.



Another chatterbot is called Librarian. (http://www.pandorabots.com/pandora/talk?botid=df7988f43e346a64)

If the following conversation is any indication, we have a long way to go before we are replaced by machines:

Human: Where is the library?
Librarian: The library? Where is it?

Human: Help me.
Librarian: How can I help you?

Human: What is full text?
Librarian: Too much recursion in aiml.

Human: How can I find a book?
Librarian: Should not be judged by its cover.

Finally, a good list of articles about bots in libraries can be found at http://www.aaai.org/AITopics/html/library.html. Google Directory also has a list of various Web sites dealing with agents at http://directory.google.com/Top/Computers/Artificial_Intelligence/Agents/Directories/. A sample from that list is http://agents.umbc.edu/. A long A to Z list of chatterbots can be found at http://www.angelfire.com/trek/amanda/botlist.htm. Another popular portal is BotSpot at http://www.botspot.com/.

While computers are nowhere near ready to replace humans, they can help make our jobs easier. By the time computers are smart enough to answer reference questions as well as people can, humanity will have bigger problems than losing jobs to robots.

References

Moore M. et al, 2004. Using an automated knowledge agent for reference and customer service. *Journal of the Medical Library Association* 92 (2): 271–3.

Smith C.B., 2002. In Search of Blessed Bots. *School Library Journal* , 34–5.

Stephenson N., 1993. *Snow Crash*. Bantam Spectra, New York.

Wizenbaum J., 1966. ELIZA—A computer program for the study of natural language communication between man and machine. *Communications of the ACM 1966*, 9 (1): 36–45. Available at http://i5.nyu.edu/%7Emm64/x52.9265/january1966.html.