Science &HEALTH

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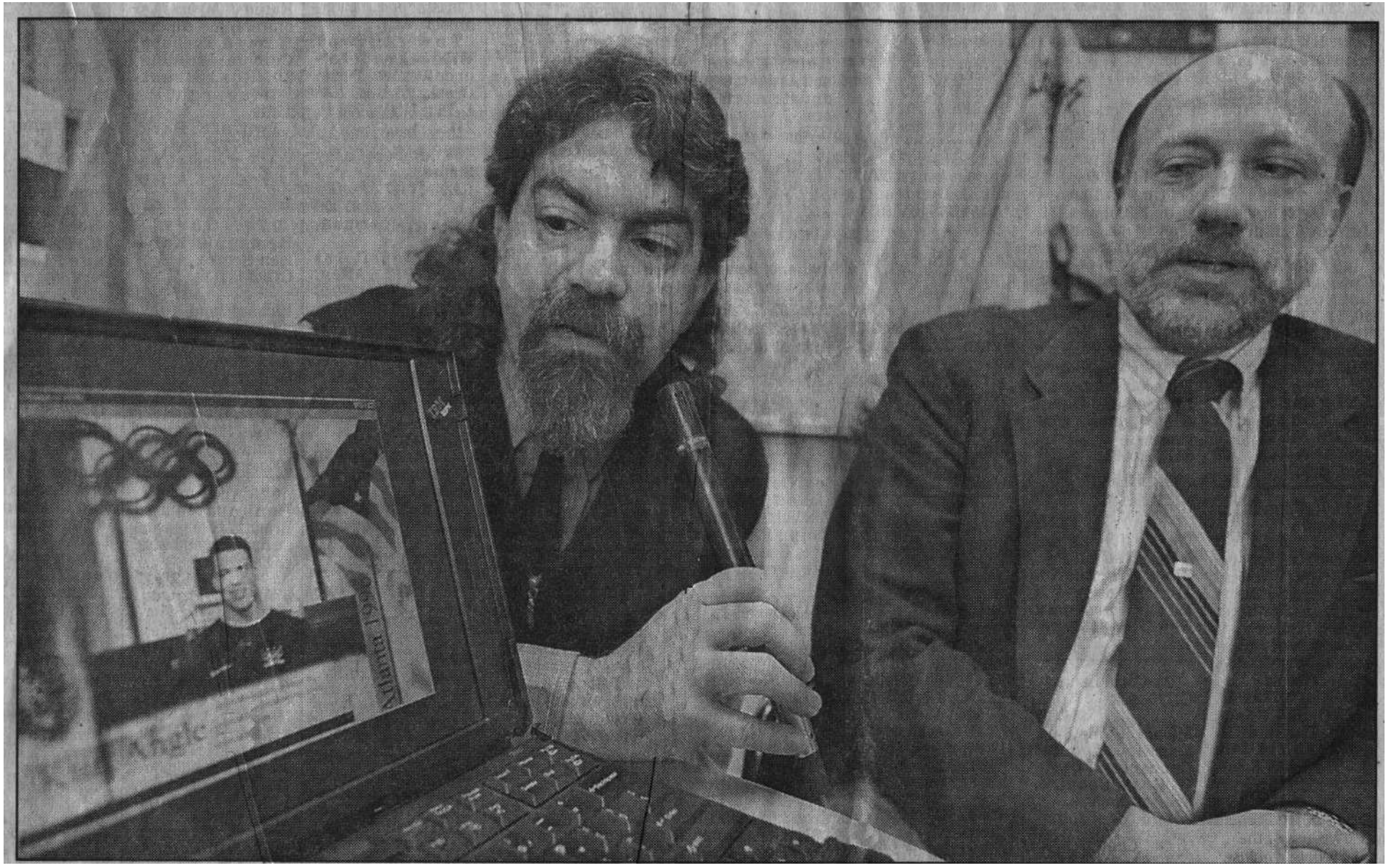

Donald Marinelli, left, and Scott Stevens show one of the examples of Synthetic video interview technology at CMU.

Darrell Sapp/Post-Gazette

Synthetic interviews

People can interact with information on computer as if talking with a person.

By Byron Spice

The hair is white, long and wild, just like Albert Einstein's.

"If I were to start taking care of my own grooming, I would no longer be myself," he says. "So to hell with it."

Just what the German-American physicist might say.

But it's not Einstein. The bass voice resonates without a hint of a German accent. The shock of white hair frames an un-Einsteinian double chin. Not to mention the great theorist died almost 42 years ago.

Whoever - or whatever - this is that peers out from the computer screen can hold up his end of a conversation, however.

Ask him to explain his famous equation, E=MC2, and he's off:

"Mass is frozen energy"

Want to know what happened when he died?

"My brain and eyes were removed and preserved for further study"

All of this is an example of "synthetic video interview" technology, developed at Carnegie Mellon University's Entertainment Technology Center.

It lets people interact with information stored by a computer much as they might talk with a person. The user speaks a question and, within a few blinks of the eye, the computer replies by displaying a suitable video clip..

The effect, if everything works right, is to get the computer user to suspend disbelief and begin to feel that he is talking with the computerized image.

The Einstein demonstration required an actor to play a role. But the same technology would be just as suitable for celebrity chat with Courtney Love or Gregory Peck, for professional advice from a neurosurgeon, or even a pitch from a car salesman.

"The possibilities are basically limitless because what we're capturing is two people having a conversation," said Don Marinelli, a drama professor and co-director of the Entertainment Technology Center.

Carnegie Mellon unveiled the synthetic interview technology last month at a computing conference in San Jose, Calif. Thousands of visitors attending the Association for Computing Machinery exhibition were able to ask questions of Einstein, as a unique 3-D projector supplied by New York's Dimensional Media Associates made it appear that the physicist was floating in front of them.

Some took delight in trying to trip up Einstein - "Why do dogs have black lips? What did you have for breakfast this morning?"

But when a maintenance worker at the convention hall playfully introduced Einstein to a friend of his, Marinelli and his co-director, Scott Stevens, took it as encouragement that they were beginning to break down the wall between the audience and the syn etic Einstein

The idea for synthetic interviews goes back several

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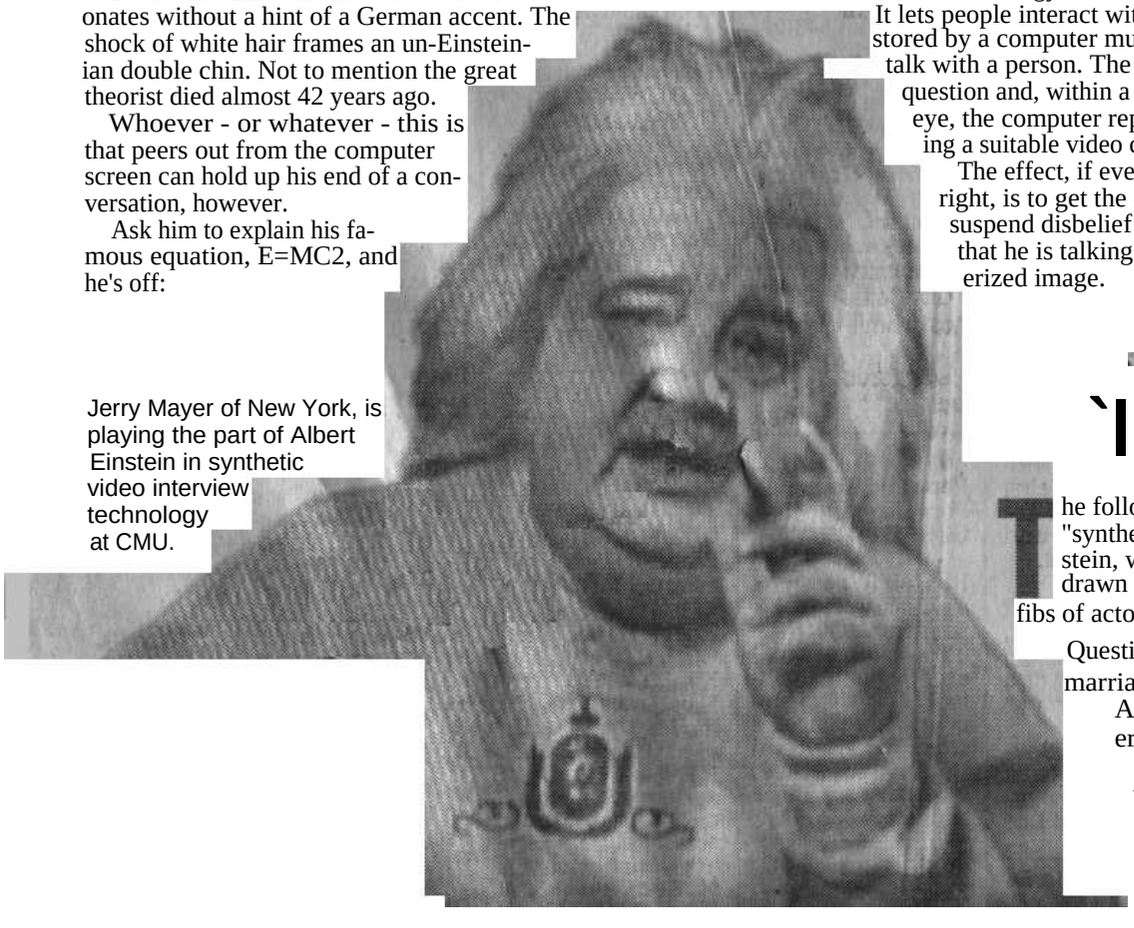

Jerry Mayer of New York, is playing the part of Albert Einstein in synthetic video interview technology at CMU.

`Interview' with Einstein

The following are excerpts from a "synthetic interview" of Albert Einstein, with the physicist's replies drawn from his writings and the ad fibs of actor and physicist Jerry Mayer

Question: What do you think of marriage?

Albert: Marriage is but slavery made to appear civilized.

Q: What do you think of women?

A: Very few women are creative.

Q: Do you like baseball?

A: I do not play games. There is no time for it.

Q: What was your starting salary at Princeton?

A: My starting salary at the Institute for Advanced Study at Princeton was $15,000 a year.

Q: What do you think of Adolf Hitler?

A: A man with limited intellectual abilities. He picked up human flotsam on the streets and in the taverns and Organized them around himself.

Q: Do you have any second thoughts about your role in the development of the atomic bomb?

A: I have done no work on the atomic bomb. No work whatsoever.

Q: But didn't you write a letter to Franklin Roosevelt advocating research that might lead to an atomic bomb?

A: I made one mistake in my life - I signed that letter to President Roosevelt.

Talking with-computer as if with a person

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years to when Stevens was at the Software Engineering Institute and was part of Carnegie Mellon's Informedia project, a federally sponsored effort to develop a digital video library.

The goal was to enable computers to search and analyze video and audio information the same way computers can sort through text. This meant designing software-to analyze speech for key words and concepts that might be of interest to a student, researcher or other user. Likewise, software was developed that summarized key elements in an image or series of images.

Some of the raw material they used for the project was a filmed interview with author Arthur C. Clarke. WQED talked with Clarke for four or five hours to produce a 60-second clip for one of its programs.

When Stevens and his colleagues used their software to analyze the content of the interview, they realized their computerized search engine could quickly scan through its contents to find the answer to a question.

If computers were fast enough, they realized, users could "interview" Clarke themselves, asking only those questions that interested them and asking the questions in any order they liked.

Combining that search technology with speech recognition programs already under way at Carnegie Mellon would complete the illusion.

"We realized a couple years ago that the type of machines being sold today were just about powerful enough," Stevens said. A recent demonstration of the synthetic Einstein interview in Stevens' office, for instance, used a computer with the same 200-megahertz MMX Pentium processor available at most retail electronics shops. "You can't buy a machine today that isn't powerful enough to do this."

To make synthetic interviews seem real and compelling, however, requires theatrical tricks as well as computer wizardry. The Entertainment Technology Center, drawing both from Carnegie Mellon's computer science and drama departments, is qualified for that task, Marinelli and Stevens said.

"The idea is to take technology and make it so refined that it seems like a normal, human interaction;" Marinelli said. "We're getting closer."

To reincarnate Einstein, Marinelli tapped an old acquaintance, Jerry Mayer, a New York actor and former physicist who had written and performed a one-man play about Einstein, "You Know Al He's a Funny Guy," in 1980 at New York's Public Theater.

Mayer, who also has written a book, "Bite-Size Einstein," was intimately familiar with many of Einstein's scientific and philosophical writings and also knew enough Einstein lore to ad lib answers to questions.

For several days, Mayer was taped as he answered questions at WRS Film and Video Laboratory in Robinson.

Though faithful to Einstein spirit the project couldn't duplicate every detail.

"You have to take theatrical license! ... because the audience demands it," Marinelli said. A thick German accent would not have aided audience interaction. And May is expertise on Einstein outweighed the fact that Mayer, um, er ... outweighs Einstein.

Einstein is the most fully developed synthetic interview so far, but Stevens and Marinelli have experimented with other subjects.

Olympic wrestler Kurt Angle, for instance, submitted to an hourlong interview about his life and his experiences at the 1996 Olympics ("I was sleeping when the explosion happened.")

Dr. Julian Bailes, a neurosurgeon at Allegheny General Hospital, has taped answers to surgical questions, enabling him to communicate with other doctors not only by speech but by pointing out features on brain scan images.

They also taped an interview with a recent Carnegie Mellon drama graduate that they think could be a prototype for celebrity interviews.

"This could be the next generation computer chat room," Marinelli said. Today, computer users can participate in online chats with celebrities that might attract hundreds or thousands at a time. Each user theoretically has a chance to ask questions of the celebrity, but the sheer volume of users tuning into the chat ensures that most will be little more than voyeurs.

Replacing these live online chats with synthetic interviews will not be practical until Internet connections are fast enough to transmit video in real time, Stevens said.

But synthetic interviews might actually have more immediacy than these live online chats, he and Marinelli suggest. Rather than seeing typed replies by celebrities to other people's questions, each user could ask the questions that interested them and get what seems to be a personal reply.

An hourlong taped interview probably could provide answers to most of the questions that users might pose, Marinelli said. Most people tend to ask the same questions of celebrities, he explained, and many questions might be anticipated based on the celebrity's latest film, book or recording.

Machine translation programs also allow people to ask questions in, say, Italian, and see the person reply while an Italian translation of their speech appears at the bottom of the computer screen.

Synthetic interviews could be used in education, not just for presenting the ideas of historical figures such as Einstein, but for recording entire college courses. They might even be a link between generations, such as a grandmother recording her remembrances for great-great-grandchildren not yet born.

The first applications, however, are likely to be linked to advertising. A kiosk at a sporting goods store; for instance, might let shoppers ask questions of a star such as Michael Jordan while also giving them information about Nike shoes.

Or rather than simply parking a new Saab in an airport terminal, car dealers might grab the attention of by -installing a virtual salesman who could answer specific questions about the car.