

Toby Howard is spooked as **computer-generated humans** prepare to take over Hollywood.

## Breeding like robots

**W**atch out, there's a Virtual Human about. Or there soon will be. According to the researchers who gathered at the Virtual Humans Conference recently held in California, v-humans may be the future of the human-computer interface and will revolutionise the entertainment industry. Also known as "digital people" or "avatars", v-humans are highly realistic computer-generated



**Companies will offer to digitally preserve our dearly departed loved ones and sell us **HIGHLY-REALISTIC WALKING, TALKING, DIGITAL GHOSTS****

models of people, with faces which lip-synchronise with speech and show emotion. V-humans have only recently become feasible because of the sheer amount of computer power required to render them in real-time. In the movie industry, the use of entirely computer-generated actors, or "synthespians", is becoming big business. Many of the crowd scenes in the movie *Titanic*, for example, used only synthespians — not an extra in sight. But synthespians don't come cheap: the effects company responsible, Digital Domain <www.d2.com>, needed the computing power of a network of 160 433MHz DEC Alpha PCs.

**Entrepreneurs have not been slow** to realise the financial possibilities of v-humans. Virtual Celebrity Productions, a Los Angeles-based company which creates photorealistic digital reproductions of celebrities, has already signed up with the estates of stars including WC Fields and Sammy Davis Jr. Within three years, says founder Jeffrey Lotman, it will be possible to digitally graft a celebrity's synthetic face onto the head of a live actor so convincingly that it will be impossible to spot the digital fake. "Can you imagine doing a new film with Marlene Dietrich?" asks Lotman.

**The thought that the dead** can be recreated as digital mannequins is getting Hollywood hot under the collar, as the studios see the enormous commercial opportunities of making movies featuring stars of the past. One such film is already underway: later this year, George Burns

will rise digitally from his grave and star in another sequel to the film *Oh, God!*. But if you create a digital representation of a person, who owns the data? Questions like this are getting the lawyers excited. Nadia Thalmann of Geneva's Miralab was recently prohibited from using the likeness of Martina Hingis in a virtual tennis match against Thalmann's well-known computer-generated model of Marilyn Monroe <ligwww.epfl.ch/~thalmann>. V-human products are already on offer for the home market. Virtual Personalities sells "verbal robots" or "verbots" <www.vperson.com>, while Haptik offers a fully 3D "virtual friend" for your desktop <www.haptik.com>. In time, companies will no doubt spring up offering to digitally preserve our departed loved ones. Supplied with voice samples and home videos from which body shapes and gaits can be extracted, the digital cloners will sell us highly-realistic walking, talking, digital ghosts.

**As new display technologies emerge** we'll have life-sized portraits hanging on the wall — but the canvas will be an ultra-thin, high-res computer display and the image will be "alive". When the true 3D display finally arrives, capable of creating a solid image anywhere in space, these digital spectres will walk around and sit with us. And then things will get really spooky.

▲ SYLVIE, VIRTUAL PERSONALITIES' 'VERBALLY ENHANCED ARTIFICIALLY INTELLIGENT ENTITY' ▼ NEED A VIRTUAL FRIEND? HAPTEK WILL OBLIGE

### VIRTUAL FRIEND 1.0 - Enabler Option

## JUST ASK JAKE

The Haptik Friendship Institute has determined in *experiments* visually challenged shades that the most vital and fundamental function of friendship is to provide support and comfort in the face of pathetic non-performance and capriciousness. In fact, one of the most valued and statistically demonstrable features of true friendship is that it prevents mental shock.

Once again, Haptik has leapt to the forefront of the friendship automation field with its revolutionary Virtual Friend 1.0 - Enabler Option. Now, for the first time ever, Haptik's Just Ask Jake software lets you use the power of the computer to automatically satisfy your enabling friendship needs beyond your wildest dreams. Why bother? JUST ASK JAKE. (Actually, maybe you'd better finish reading this first.)

Never again will you have to wait for support in your wallowing until your enabling friends bother to pick up the phone. JUST ASK JAKE, the true friend substitute, will never fail to:

- 1) tell you that you're OK, no matter how bad you screw up; and
- 2) reassure you that anyone who's doing better than you is a) a jerk, b) a cheater, c) secretly miserable; or d) lying.

Just Ask Jake's calendar function verbally reminds you of all your daily appointments, then automatically explains why they're not worth the hassle.

Just Ask Jake is fully equipped to speak for you, any excuse, alibi or cop-out that you type into the computer. Conversations complete with a switchable, audible cursing function.

**FREE DOWNLOAD** - Check out Jake for real.

It just might be the last thing you ever bother to do!

On dead jake a different kind. And, hey, thanks a lot.

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Soon, says Roger Gann, **you won't be able to tell** if it's a person or a machine on the end of the line.

## Who said that?

In the next few years we will be chattering away not only to our PCs, but to a whole range of domestic devices – not to mention automated telephone services. When people call their bank, airline reservations centre or even BT, it will be hard to tell if a human is on the



▲ **SOON, WHEN PEOPLE CALL THEIR BANK OR AIRLINE RESERVATIONS CENTRE, IT WILL BE HARD TO TELL IF A HUMAN IS ON THE OTHER END OF THE PHONE LINE OR AN INTERACTIVE VOICE-RESPONSE SYSTEM**

other end of the phone line or some fiendishly clever interactive voice-response system. Recently, IBM and Voice Control Systems together announced a range of development tools to further this aim of eventually replacing touch-tone voice systems. The prospects are fascinating. When you call your tour operator to book a holiday, you'll be greeted by an

intelligent, computer-based agent. It might use a range of phone voice services, from limited vocabulary applications that recognise every word, to programs able to enter into complex conversations featuring natural language understanding, built-in intelligence and contextual memory. Such programs can improve the efficiency of an automated phone system and make it easier for remote workers to access phone registries, report generators and third-party phone systems. They have a useful role to play in businesses

where customer service is critical, such as call centres. And the cost savings can be huge.

AT&T's directory service has an automated voice operator that asks a directory enquiries caller "What city? What listing?" before connecting to a human operator. This saves AT&T \$200 to \$300 million a year in labour costs.

BT has been trialling Brimstone, a prototype corporate directory application, in its Martlesham Heath speech-recognition labs for some time. The system was developed to allow voice access to a subset of the BT corporate

internal telephone directory, Interview. This corresponds to approximately 5000 entries, resulting in a vocabulary of about 3000 surnames and 900 first names. The database and associated vocabularies are automatically updated from the central repository. Early research has shown that it may be fruitless to ask the computer to recognise every word and proceed from there to an understanding of what was intended.

**A better solution** is to let a dialogue system recognise as many words as it can, but formulate its responses on the basis of key words in a sentence. In effect, it looks for the words that convey context-sensitive meaning. Airline ticket booking is one obvious application. A caller can say the same thing several different ways, and still the meaning will be grasped. The system might return prompts such as "Day of travel?" "What time?" and "Which class?", progressively narrowing the focus in a way which makes the dialogue easy for the computer to master.

**Speech recognition software** can also be used for speaker verification. Voice Control Systems has developed SpeechWave Secure, which can recognise and verify a single, naturally spoken string of digits, allowing any application using continuous digit recognition to add speaker verification without altering the call flow. For example, the identity of telephone banking customers can be verified while they speak their account number, without the need to enter a password or PIN. As a

**AT&T's automated telephone directory service SAVES \$300 MILLION A YEAR in labour costs**

fallback, the system offers a Posi-Ident feature which fires personal questions at the caller if their identity cannot be confirmed by speaker verification alone.

**Not surprisingly, the sales prospects** for technology of this sort are rosy. According to US analysts TMA Associates, the total value of all speech-based telephony product sales will exceed \$11.6 billion by 2001. Most of these sales will be of limited-vocabulary systems. □