Some suggest that fraud examiners could use computerized "avatars" to collect basic information. Here we look at potential technological advancements and the implications of avatars in the fraud-fighting profession. You decide.

The authors contend that little, if any, research exists on testing avatars for the interview component of fraud examinations. However, they're exploring the efficacy of applying avatar concepts from other fields to the anti-fraud profession. The views expressed in this article aren't necessarily those of the ACFE. — ed.

At the Nogales, Arizona, port of entry, travelers step up to a kiosk and an "avatar" (a virtual computerized human) greets them. The avatar then asks them a series of basic immigration questions, and the kiosk assesses the interviewees' responses and behaviors for credibility. The system detects changes in physiology through sensors that can measure millimeter changes in pupil dilation, temperature changes in the face, and pitch and tone changes in the voice.

This example isn't from a science fiction novel. The Department of Homeland Security-sponsored National Center for Border Security and Immigration at the University of Arizona (UA) has deployed and tested an avatar-based rapid screening kiosk at the Nogales port of entry. (See Deception Is Futile When Big Brother's Lie Detector Turns Its Eyes on You [http://tinyurl.com/ns9jwal], by Adam Higginbotham, Jan. 17, 2013, Wired.)
Do people feel comfortable when interviewed by computerized human images? Is the information obtained via avatars reliable? The Nogales' port of entry avatar's script is fairly static — it asks a hard-scripted set of questions and doesn't ask follow-up questions — but UA reports that it's helped relieve the immigration agents' interviewing workload at the U.S. border. Perhaps, more importantly, UA says that interviewees seem to treat the avatar like a human by interacting with fairly natural social manners.

While technology, obviously, can't completely automate and replicate the effectiveness of human interviewers, fraud examiners might be able to use it to perform some basic tasks.

Could these tasks help fraud examiners collect basic information that will benefit subsequent fraud examination stages, or is the idea too far-fetched? Will information collected via avatar interviews be admissible in court?

In this article, we'll look at the efficacy of avatars in interviews and techniques interviewers can use with avatars to possibly increase rapport-building capabilities and maximize information interviewees disclose to them.

The advancement of graphical avatar technology is sufficient enough that fraud examiners need to at least begin considering additional questions:

- How can fraud examiners adapt this technology for their needs?
- How can avatars help fraud examiners work more effectively and efficiently?
- What are the implications of using computer-assisted technology?

Our intent is to prime your thinking so you can explore this potential technological advancement. We're not certain of the viability and implications; research might find that using avatars during interviews in fraud examinations is useless. However, we feel it's time to at least explore the subject.

**Importance of the interview**

Interviews are integral to fraud examinations. Fraud examiners work hard to master this process. In addition to many books the ACFE offers (i.e., *Interviewing and Interrogation, 2nd Edition* [http://tinyurl.com/omfz5py](http://tinyurl.com/omfz5py), by Don Rabon, CFE, and *Persuasive Interviewing: A Forensic Case Analysis* [http://tinyurl.com/q7a2m65](http://tinyurl.com/q7a2m65), by Don Rabon, CFE, and Tanya Chapman), many ACFE seminars focus on making attendees better interviewers. Interviewers certainly become more effective with experience. However, could avatar-based automated interviewing augment fraud examiners' efforts?

Consider this scenario. A subject might have taken inventory from his place of employment. The fraud examiner, who's a loss prevention expert, tells the subject that he'll be collecting some general background information "via computer" before he spends any time with the fraud examiner.

The subject enters a room and sits at a desk that contains nothing but a computer. The fraud examiner is in the next room monitoring and using a computer to video record the subject's responses. A human-like face appears on the computer screen and provides instructions to the subject. The avatar repeats the fraud examiner's statement to the subject that the purpose of the meeting with the avatar is to collect some basic information.

The avatar then asks a series of questions. (The avatar will ask the same questions of all subjects related to the case.) Throughout the 10- to 15-minute session with the avatar, the fraud examiner begins to build a profile of the subject. He identifies body language changes as the avatar asks questions. He doesn't need to take notes because he knows he'll be able to watch this interview multiple times. When the fraud examiner later interviews the subject in person, he can compare the avatar interview to the subject's behavior.

In our opinion, the avatar interview can assist the interviewer with his calibration and provide him with a wealth of information that he can use when he begins the "actual" interview. The first set of questions tends to be the same in every initial interview, so an automated system might be proficient in gathering boilerplate information.

**Less apprehension in avatar-based interviews?**

Obstacles can prevent a subject from willfully disclosing important information in an interview. Therefore, it's important to help the subject feel comfortable. Subjects might be concerned with their long-term or immediate reputations. Though it might sound trite,
people often manage their reputations in social situations by disclosing or concealing information. When they don't feel the need to manage their reputations, they often speak more candidly. (See Why Does Someone Reveal Highly Personal Information? Attributions for and against Self-Disclosure in Close Relationships (http://tinyurl.com/qb32a6k), Valerian J. Derlega, Barbara A. Winstead, Alicia Mathews, Abby L. Braitman, April 18, 2008.)

This is when an avatar might be advantageous.

Whether computer- or human-driven, the virtual nature of avatars might convey a sense of aloofness that allows people to discard their inhibitions. Compared to a face-to-face interview, the avatar might create a diminished presence. If the avatar is computer-driven, then the interviewee might be overtly aware that the computer isn't capable of moral or social judgment. The virtual interface also might provide a sense of social distance that protects the interviewee from any immediate negative verbal or non-verbal feedback (e.g., a flash of disgust or disapproval on the interviewer's face).

Sometimes even the most emotionally disciplined subjects leak their feelings. An interviewer's leaked non-verbal feedback can be detrimental in an interview. Regardless, when a subject is burdened with shame, guilt or fear, it could be comforting knowing that the person listening to his or her confession is hidden in another room.

An avatar might give the interviewee the opportunity to get something off his or her chest without the shame of telling a real person. If a fraud examiner simply wants to perform an interview remotely, a less-than-human avatar could embody the interviewer. This provides the same reduction in the subject’s evaluation apprehension.

AN AVATAR MIGHT GIVE AN INTERVIEWEE THE OPPORTUNITY TO GET SOMETHING OFF HIS OR HER CHEST WITHOUT THE SHAME OF TELLING A REAL PERSON."

Even when the situation doesn’t require a confession or the disclosure of sensitive information, avatars might still be beneficial because they could elicit higher quality information from subjects. Virtual job interviews are a case in point. While online job fairs and interviewers haven't replaced traditional settings, they do allow employers to reach out and get to know candidates in a more informal scenario. [See Marketing and Consumer Behavior: Concepts, Methodologies, Tools, and Applications (http://tinyurl.com/payrwwf), Information Resources Management Association (USA), December 2014, page 881.] Candidates might give more candid and helpful responses in an online setting than via face-to-face interviews. Therefore, virtual job interviews could be a useful tool for narrowing candidate pools.

In more hedonic settings, many of the participants who find entertainment in virtual worlds, such as Second Life, or in massive multiplayer online games, such as World of Warcraft, might consider themselves socially awkward. Yet they’re able to fulfill their need for social interaction in these “safer” virtual environments. (See The virtual therapist will see you now (http://tinyurl.com/n66evk6), by Samantha Murphy, SunSentinel, Nov. 9, 2010.)

Let’s broaden our thinking: during face-to-face settings in which risk or guilt is part of the social equation (e.g., confessions, interrogations, audits), interviewees might have a tendency to be socially awkward. Avatars then might reduce some of the social awkwardness, perceived risk and apprehension associated with interviews.

Building rapport with avatars

Without question the success of an interview relies heavily on the fraud examiner's ability to build sufficient rapport with the witness or suspect. Establishing rapport in an interview decreases anxiety and allows the subject to open up and speak freely. Are avatars capable of building a sense of rapport? While much research is still needed in this area, the existing evidence suggests that subjects might be ready to accept and respond to computer-controlled avatars' attempts to build rapport with them.
Have you ever caught yourself mimicking the movements, facial expressions, postures or even speech patterns of someone who was telling you an engaging story? Researchers refer to this as the "chameleon effect." From birth, humans are wired to mimic the actions of those they observe. Though people rarely notice when others mimic them during a conversation, empirical research has shown that mimicry increases the mimicker's likeability and persuasiveness. (See The Chameleon Effect: The Perception-Behavior Link and Social Interaction (http://tinyurl.com/q6cxxv4), by Tanya L. Chartrand and John A Bargh, 1999, 76(6), 893–910.)

Imagine an avatar that copies your movements. You move your head left and a few seconds later the avatar subtly tilts its head in the same direction. As you talk, your head or hands bob in rhythm with what you're saying. The avatar subtly mimics those same motions. You aren't cognizant of the avatar's mimicry, but it does increase the avatar's likeability and persuasive effect. Researchers have created avatars that are able to do just this. (See Virtual Peacemakers: Mimicry Increases Empathy in Simulated Contact with Virtual Outgroup Members (http://tinyurl.com/lcvtcod), by B.S. Hasler, G. Hirschberger, T. Shani-Sherman, D.A. Friedman, Cyberpsychology, Behavior, and Social Networking, Dec. 2014.)

Avatars capable of conveying non-verbal cues at appropriate times during the speaker's dialogue might encourage them to talk longer. Next time you're listening to someone, observe your own actions. Do you employ programmatic behaviors to indicate you're listening? What is it that prompts you to provide a non-verbal cue to encourage the talker to continue or to assure them that you're listening? A pause in the dialogue? A look on the face? A change in the pitch of the voice? Or do you have a socially driven internal timer that prompts you to occasionally provide the encouraging head nod or smile? How do those behaviors change when you're sincerely listening as compared to wishing they'd just stop talking?

As you observe yourself, you might discover that your listening actions actually are quite automatic and programmatic. You also might find that the events that trigger your listening "behaviors" are quite easy to articulate. As technology advances, computers' ability to sense and respond to exactly the same cues you detect will only increase. A microphone currently allows computers to detect pitch changes in the voice or pauses in the dialogue. A camera allows computers to track facial and hand expressions. So, imagine talking to an avatar that, when you pause for a few minutes, says, "Mmm, keep going." Or an avatar that nods occasionally in acknowledgement to what you have to say? Would you feel a tendency to keep talking?

We're also attracted to people and things that seem similar to us because it reinforces concepts of ourselves. We tend to be more pro-social towards and influenced by people similar or familiar to us. What's more familiar to a person than his or her own face? Several software packages, like FaceGen (http://facegen.com) or HeadShop (http://tinyurl.com/ms9h79z), make it easy to create avatars from photos of other people.

At the University of Arizona, during mock job interviews, students indicated that they liked and felt more rapport with an avatar that looked like them. This was compared to avatars that didn't look like them and a human interviewer that interfaced with them on a video conference call. (See Persuasive Embodied Agents: Using Embodied Agents to Change People's Behavior, Beliefs, and Assessments (http://tinyurl.com/lvkqsm), by Matthew D. Pickard, The University of Arizona, 2012.) Also, students referenced themselves more often when they spoke to the "familiar" avatar. Is it possible that subjects in a fraud examination interview would react similarly when speaking to an avatar that looks like them? Researchers need to specifically test these phenomena in investigative scenarios.

**Time-saving techniques**

Interviewing is a crucial, but time-consuming part of an examiner's work. To review, an avatar might have the potential to:

- Offload the time a fraud examiner spends on basic, boilerplate interviews.
- Help enlarge the sample of subjects an examiner reaches during the data collection stage of the investigation.
- Allow fraud examiners, in a web-based deployment, to quickly interview witnesses and suspects without having to travel to distant locations.
- Free fraud examiners' cognitive resources, which could allow them to focus their full attention on the subjects' behavior and subsequent behaviors. Fraud examiners can plan more informed strategies if they're able to study interview recordings before
Implications for fraud examiners

We’ve attempted to highlight some of the benefits and possibilities of an avatar-based automated interviewing system. However, there’s a host of issues associated with the use of avatars. First and foremost, we haven’t addressed the legal and forensic aspects of data collected through avatar interviewing in this article. We recommend that fraud examiners consult with legal counsel before implementing any of the innovative ideas suggested here.

It’s also unclear under what circumstances witnesses or suspects will open up, if at all, to an avatar. The authors of this article and other researchers are still exploring this. This is a rather complicated area because the possible combinations of avatar characteristics (e.g., gender, ethnicity, voice, demeanor, personality), subject personalities (e.g., extroverted vs. introverted) and states (e.g., moods, motives, beliefs) are infinite.

We also suspect that fraud examiners might be reticent to adopt avatar-interviewing technology for a number of reasons. They might not trust the avatar or know how to use it. Fraud examiners might rely too much on the technology and stop thinking critically on their own. Again, we emphasize that we don’t believe avatar-interviewing technology will completely replace human interviewers — humans will always need to keep their thinking caps on.

Lastly, even though technology has made it easier to create avatars, there’s still a fairly steep learning curve for customizing and animating avatars — 3D modeling and animation isn’t a layman’s sport. Firms most likely will find the process of installing and maintaining an avatar interviewing system to be complex and initially costly.

Research in this area is just beginning. How can fraud examiners use pre-interviews? What questions would fraud examiners like avatars to ask? What questions will aid fraud examiners in the calibration process? What other issues do we need to address to collect useful evidence with avatars? As researchers develop experimental studies, we’ll more clearly see the benefits, if any, of this technology in the interviewing process in fraud examinations.

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