

Health avatar could become modern version of doctor's house call

January 7 2016, by Eric Barton

It's happy hour, and there's a man, a man with a drinking problem, headed to his favorite bar. He turns into the parking lot, and his phone comes to life. It's an image of a woman, her voice calm and reassuring.

"I noticed you're headed to the bar," the woman says, using the GPS in his phone to track him. The man explains that he's had a bad day and just needs a drink or two.

"How about instead I call a friend for you?" the woman asks, knowing that the man's friends have talked him out of destructive behavior before. The man agrees, and the woman on his cellphone dials up someone who can talk him out of a bad decision.

This may all seem like something from a far-in-the-future science fiction movie. But a researcher at FIU is close to making it a reality.

Professor Christine Lisetti has developed a medical avatar, an [interactive computer program](#) that can help people better understand a host of medical issues and avoid [destructive behavior](#). Next year, the program will be tested in a clinical setting, and Lisetti believes it will stand in when doctors and nurses aren't available.

Lisetti's program is far more than a dry computer program. Her team has created an animated character capable of advanced human responses to questions.

"We want to create a social companion you can relate to long-term," said Lisetti, director of FIU's Affective Social Computing Laboratory in the School of Computing and Information Sciences. "We want it, or her, to know you long-term and understand your health patterns."

Lisetti began her work as a graduate student in the 1990s. She helped found what was then a new field of study called affective computing, or programming computers to understand the nuances of human emotion. The field works to develop a simulated emotional intelligence that can interact with a person in a realistic way. In the early 2000s, Lisetti helped develop a road safety program that could detect when a driver falls asleep, technology that's now being used by car manufacturers.

After joining FIU in 2007, Lisetti began developing a virtual health assistant. It started with a simple question-and-answer program, which could make determinations about a person's problems with substance abuse.

The next step was designing an avatar, a computerized figure that could be emotionally expressive and have a conversation with the user. Lisetti's team calls her Lola, and since then, they've been tinkering with ways to give her realistic reactions and emotions.

Recent additions have endowed Lola with non-verbal behaviors, something Lisetti's team has determined are key to making her seem more human. To accomplish this, they recorded video of addiction counselors interacting with clients.

After studying five hours of tapes, the researchers noticed how often the counselors would look down or simply turn their attention to something else in the room, as is common in normal conversation. "It may seem obvious, but when we had her stop staring directly at the user, it dramatically improved the program," Lisetti said.

Lola can also now understand some of the nuances of human behavior. For instance, she can smile during a light moment of a discussion. Lisetti's lab has run internal tests on the program, but Lisetti knew that before Lola could be used by medical professionals, the avatar would need to be tested in a clinical setting.

Just how that would work wasn't clear until Lisetti had a chance encounter at FIU's Faculty Club. She shared a table one day with Mark Williams, then-interim dean of the Robert Stempel College of Public Health & Social Work. Fascinated with Lisetti's research, Williams offered to help put together a clinical trial.

Williams and Lisetti submitted their idea to the National Science Foundation and received a \$497,000 grant to conduct the trial, which is expected to begin next year. Similar programs using a text-message-based interface have proven helpful in the past. A text-message system meant to reduce alcohol consumption among problem drinkers worked for half of users after a year, a high success rate for substance abuse counseling. Lisetti thinks the number could be even higher with a computer-based avatar.

Williams thinks the avatar will be beneficial especially for those who don't have access to in-home medical care.

"For people whose insurance doesn't cover in-home care, or simply just don't have access to it, the avatars can serve many purposes," he said. For instance, the avatar can help remind patients about when and how much medication to take. The avatar can also store other information given to the user by a doctor, so the patient can ask follow-up questions of the avatar once back at home.

Lisetti imagines the avatar becoming a companion that users interact with for years. The benefit is that a computer program never forgets, so

the avatar will have the user's full medical history any time a new issue comes up. If the user, for instance, is diagnosed with cancer, the avatar would know that a previous immune disease might become a problem in chemotherapy.

Lisetti, who says it might be a few more years before the [avatar](#) is ready to go live, gets help from five undergraduates who work in her lab, along with a research assistant and one or two Ph.D. students. Affective computing is a profitable field now, and three of Lisetti's former lab workers this year took jobs at software companies working on avatars.

"We are just beginning to understand all the benefits of this," Lisetti said. "We are creating a program that can fill many needs."

Provided by Florida International University

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