A virtual 'Lolita' on the hunt for paedophiles

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Children have come to make up a significant proportion of the active users of the Internet, but the presence of paedophiles marks them out as potential victims of abuse. With the aim of preventing such abuse, Spanish researchers have created a computer programme capable of passing for a fourteen-year-old girl to detect these predators in chats and

social networks. The Ertzaintza (Basque Country police force) has already shown its interest in Negobot, as the fake victim is named.

One of the major scourges on the Internet is that of paedophiles, with examples as extreme as child pornography or sexual exploitation. Children, who are very active users of the Internet, are potential victims to these predators.

With the aim of automatically detecting the behaviour of paedophiles on the web, researchers from the University of Deusto have created Negobot, a conversational agent that simulates a fourteen-year-old girl and uses game theory to hunt for possible paedophiles.

"Chatbots tend to be very predictable. Their behaviour and interest in a conversation are flat, which is a problem when attempting to detect untrustworthy targets like paedophiles," as explained to SINC by Carlos Laorden, researcher at DeustoTech and member of the team responsible for Negobot's creation.

"What is new about Negobot is that it employs game theory to maintain a much more realistic conversation," Laorden goes on. As such, they have managed to produce a bot that varies its behaviour over time and the course of the conversation.

Negobot is a set of seven conversational agents in one. Each one has a different way of behaving. Given that the most dangerous paedophiles can hide their intentions for days, the programme begins with a neutral stance (level 0), which it can maintain indefinitely.

If the subject shows no interest, he is tempted with a topic of conversation to his liking without entering into personal topics. This corresponds to levels -1 to -3, in which the bot appears insistent, almost offended, so as to capture the subject's attent.

In contrast, if suspicious behaviour is detected, for example requesting personal information, or indifference concerning the age of the virtual girl, the level rises to +3, which attempts to obtain personal data from the suspect.

"The most dangerous paedophiles are very careful about giving out information," says Laorden. "These days it is sufficient to obtain a social network profile, mobile number or email address, information that is provided to authorities in order to open an investigation."

Useful for social networks

Nevertheless, Negobot does have certain limitations, such as language, because although its conversational abilities are very wide-ranging, it is unable to detect linguistic phenomena like irony. "It can be seen as a filter that helps analysts from government safety bodies and forces," Laorden affirms.

To avoid raising suspicion in the alleged paedophiles, Negobot keeps a record with information on the subjects in order to conduct conversations separated in time, in addition to techniques to vary response times, take the lead in the conversation on occasions or employ colloquial or even poorly written language.

As for its use, "Negobot has already been implemented and trialled actively on Google's chat service and could also be translated into other languages," Laorden explains. "We do not discard the possibility of bringing it to new channels in the future and we believe it could be a very useful tool for social networks to incorporate. In fact, we have already reached a collaborative agreement with the Ertzaintza, who have shown considerable interest," he concludes.

More information: Laorden, C. et al. Negobot: A conversational agent

based on game theory for the detection of paedophile behaviour, *Proceedings of the 5th International Conference on Computational Intelligence in Security for Information Systems* (CISIS). Ostrava (Czech Republic), 5-7 September, 2012.

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