

Using avatars and robots to treat social disorders

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EU researchers are demonstrating how avatars and robots can be used to help patients suffering from schizophrenia, autism and other social phobias.

Schizophrenia, autism and other social disorders cause much suffering for both [patients](#) and their loved ones. Now the EU ALTEREGO project has developed a new clinical method, computer architecture and software to help patients adapt their behaviour by interacting with avatars and robots.

The ALTEREGO project has brought together many different kinds of professionals: doctors, psychologists, psychiatrists, computer and [human movement](#) specialists, as well as mathematicians and roboticists. It is rooted in the innovative rehabilitation of social disorders through the concept of similarity, a new cross-disciplinary theory combining movement neuroscience and cognitive science.

Avatar-led simulations

The similarity theory suggests that it is easier to interact socially with someone who looks like us. This resemblance can be morphological (the form of a person), behavioural (their actions) or kinematic (the way they move). In ALTEREGO, artificial agents such as avatars and robots have been used to manipulate these three components in real-time interaction situations with patients.

The researchers worked with around 40 patients in the first stage of this three-and-a-half-year project, recording their movements with cameras and creating their avatars in computers using virtual reality techniques. Using a 'mirror' game, involving the synchronized handling of coloured balls, which is known to increase affiliation, the patient took it in turns with the avatar to lead, as different variables were introduced in both the game and the movement of the avatar.

'Everyone moves in a very personal way and, using variables, we work with this to transform similarity into difference, by morphing the avatar and trying in this way to change the behaviour of the patient over time,' said project coordinator Prof Benoît Bardy, Director of the European Centre for Research on Human Movement (EuroMov) at the University of Montpellier, France.

Working with iCub

The patients have also been working with iCub, a humanoid robot developed as part of another EU project, ROBOTCUB. It has 53 motors that move the head, arms, hands, waist and legs, and it can see, hear and smile. 'The robot is different. It's not like the patient, so we could also test for the interaction with someone completely different.'

ALTEREGO, which aims to open the door to a new generation of social artificial agents in service robotics, includes research in fundamental and clinical neurosciences, interaction modelling, the development of new computer-vision techniques and human-robot interfaces, as well as evaluation of the scenarios with patients before, during, and after training sessions.

'We appreciate that this is a very sensitive project where the welfare of the patients comes first, so we are careful to continue to seek clearance for all our activities from national ethics bodies,' said Professor Ludovic Marin, the project's lead scientist.

Next steps

In the final six months of the project, the researchers are expanding the pool of schizophrenic patients to 100 to monitor longer-term evolution in interacting with the avatars. They are also developing software for the purpose of downloading by other projects and hope, in future projects, to test the technology on autism and other social phobia patients.

'We also believe it is possible to develop applications that patients can use on screens in the home, perhaps on a TV or home entertainment system, where they perform various exercises with their avatar that can teach them social skills over a longer period of time," added Prof Bardy.

The ALTEREGO project started in February 2013 and runs until 31 July 2016. It involves six partners in four European countries, and has received EUR 2.9 million in EU funding support.

More information: For more information please see the ALTEREGO project website: www.euromov.eu/alterego/

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