# Intelligent agents foi behavioural change

Identifying and modelling adaptive mechanisms

can provide a solution. Intelligence research group, intelligent systems to Dr Willem-Paul Brinkman of the Interactive practice often remains a challenge. According and relaxed lifestyle, but achieving this in We all know about the benefits of a healthy

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can also be used to teach skills such as negotiating or making practice with virtual characters, for example to help them reality systems that allow sufferers of social phobias to coaching to overcome their sleeping disorders, or virtual in all shapes and sizes, such as mobile apps that offer people research on mental health. Interactive Intelligence research group has focussed their decisions under pressure. During the past fifteen years, the get over their fear of giving presentations. These systems These so-called Behaviour Change Support Systems come

flying, but in recent years it has been expanded to include the fear decreases by virtue of habituation. In the early years the exposed to situations that are frightening for them, and their Most people will be familiar with the research into virtual abused in their youth. (PTSD) among war veterans or people who were sexually treatment of social phobias and post-traumatic stress disorder research focussed on the treatment of fear of heights or reality therapy systems. In a virtual environment, patients are

in order to trigger reactions similar to those produced by reflect on their goals and understand the progress they have them in the change process, but they can also help them to can provide information on a patient's health and motivate using intelligent virtual health agents. These virtual coaches Another means of stimulating behavioural change involves human coaches made. These agents are often given human characteristics

#### Stimuli

In addition, the system must be able to reason based on sensors, or directly by conducting a dialogue with the user cognitions and emotions. This can be done indirectly with able to observe the behaviour of the person; their perception translated into a computer system. These systems must be A key part of the research on systems like these involves knowledge, and user and progress models. identifying and modelling adaptive mechanisms that can be

> adapt its response to what it observes." understands what kind of individual it is dealing with can goals," explains Willem-Paul Brinkman. "A system that little different, it is important to personalise such stimuli. or stimuli to change their behaviour. Since everybody is a way to help the patient is through finding the right incentives steer the situation towards the intended objective. Often, the Finally, the system must also be able to respond, in order to "You need to have a clear understanding of these people's

### Room thermostat

deactivated once the desired temperature has been reached room thermostat, which is activated when it gets cold and of such a mechanism. He compares this mechanism with a Brinkman gives the negative feedback loop as an example fear level: if you are not afraid you will not benefit from "The treatment of a social phobia requires creating a certain

"Sometimes it is easier to talk flesh-and-blood person" to a machine than to a

level of fear." questions or responding more negative to the patient's dialogues more unnerving by asking more challenging is not afraid enough, it will make the virtual experience recognition software. If the system detects that the patient heart rate or by asking them questions using speech how afraid the patient is, for example by measuring their treatment will not work. Our system attempts to measure the experience of fear and if you are too afraid then the until it detects that the patient has reached the desired answers. The system will continue to increase the pressure

## Effect and acceptance

whether the system has the desired effect, the TU Delft an important part of the research. In order to ascertain researchers collaborate with clinical partners. Together with Testing the effectiveness and acceptance of the systems is



of events and a certain method of questioning, take the holiday memories. Can a virtual agent, with an ontology tic memories as part of their treatment." using a virtual agent to question PTSD patients about traumathat this is possible, then we will be ready for the next step: subject's memories to a deeper level? If we can demonstrate actually works. "For example, we are currently studying serve as a preliminary trial to test whether the mechanism are also being conducted in the faculty. These experiments Erasmus University Rotterdam they examine such computer computer-aided treatment of social phobias and with the University of Amsterdam they conduct a study into designers where they need to focus their efforts. Experiments such as convenience, confidence and safety, tells the Understanding this experience factor, involving aspects how do the patients experience it? What factors play a role?" support in the treatment of PTSD. "Acceptance is crucial here:

> computer, so that healthcare workers would have more time it. "It would be ideal if certain cases could be dealt with by a to provide this care in the future while more people will need

population and ageing - means that there will be less people The changing demography – reduction of the working than they used to and often suffer several chronic illnesses. tant social challenge for the future." People today grow older "Healthcare workers would like to be able to do the same, but the agent it can repeat the routine as often as required. always has time. And if the patient does not understand patients with a sexual abuse trauma." In addition, an agent

for those cases that require human interaction."

it is simply not always practically feasible. This is an impor-

#### Advantages

to a flesh-and-blood person. Consider as an example PTSD advantages. "Sometimes it is easier to talk to a machine than According to Brinkman, a virtual health agent has clear

The Interactive Intelligence research group is organising the Fifteenth International Conference on Intellige Virtual Agents (IVA 2015) in Delft from 26 to 28 Augu

1 laptieve mechanismen die vertaald kunnen worden in een computersysteem. Het is belangrijk dat het systeen adrag van de mens, zijn beleving, cognities en emoties kan waarnemen. Dit kan indirect met sensors, of direct

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