# VR Experience Helps in Understanding and Treating Schizophrenia

Author: **Christian Keszthelyi**

*The University of Malta's Department of Artificial Intelligence and Department of Mental Health have teamed up to create a simulation to better understand and potentially help treat schizophrenia. **Christian Keszthelyi** steps through the looking glass to see what living with schizophrenia is like.*
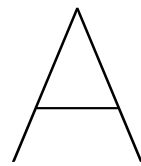
As the virtual reality (VR) headset kicks in, the player finds themselves in a commonplace office. The game prompts the player to carry on with mundane tasks: answer ringing phones, handle files, talk to the receptionist. But then, all of a sudden, voices start calling to the player from unknown sources. The voices get louder, berating the player for being unworthy, flooding the player's mind so much that completing the humdrum tasks is almost impossible.

While this might sound like an interesting premise for an indie game, it is also an incredibly useful educational tool. It allows healthcare students to safely experience symptoms of psychosis and schizophrenia first hand, helping them to better empathise and treat their future patients.

Many patients with psychosis experience everyday social situations as anxiety-provoking. The fear patients experience in such situations may force them to withdraw from social activities. This jolts them into a self-generating cycle of isolation that alienates them from their communities, which in turn, leads to the further deterioration of physical and mental health. This is an issue that can be tackled with a two-pronged approach: actually helping patients and educating their surrounding communities on how to support people with psychosis.

BEGIN SIMULATION

In this context, researchers at the University of Malta are looking into VR and, in the longer term, augmented reality (AR) solutions to tackle both aspects of this issue. Achieving progress in this field would be a game changer for our societies at large. Breaking the cycle of isolation requires direct, highly active treatment in troubling situations so that patients learn how they can safely and confidently enter them.

Early studies established that people could distinguish between physical and virtual realities. Researchers found positive indications that participation in virtual experiences, applied with customised care to the patient, did not worsen the symptoms. Researchers have considered safety risks to ensure that experiences in VR will not trigger psychotic episodes in either healthy individuals or patients.

The project started as a niche exercise. 'We had been approached by the Faculty of Health Sciences, as they were looking for a solution to help their students understand what it means for someone to live with schizophrenia. ●

Voice: Do not trust him. Why is he speaking to you?

Left and right: Screenshots from a VR simulation showing auditory hallucinations in red text.

Traditionally in class, a student would stand behind a peer and every now and then say something in their ears to imitate auditory hallucinations. We decided to simulate this with virtual reality,' Prof. Alexiei Dingli, Professor of Artificial Intelligence at the Faculty of Information & Communication Technology, says.

DID YOU HEAR SOMETHING?

The VR environment mimics a normal day in an office scenario. The 'player' is tasked with mundane missions such as carrying boxes or sorting out some files. But then auditory and visual hallucinations start intervening, sensations that have been modelled based on research into how schizophrenic patients experience their days.

The VR experience moves beyond interactive, three-dimensional video footage. It is fully responsive and specifically customised to the player by artificial intelligence (AI). No single session provides the same set of events.

'You are immersed — not just watching a 3D virtual-reality clip. You are free to roam in this office-based environment, where we have plenty of occurrences to simulate, from a telephone ringing to organising documents in a storage room or taking orders and executing commands,' Prof. Josianne Scerri, Associate Professor of Mental Health at the Faculty of Health Sciences, says.

The project was piloted on mental health nursing students. They care for and support, or will do after their studies, individuals with schizophrenia. The (to-be) nurses have had an overwhelming experience during the pilot.

What does the 'player' of the VR game experience, though? 'We simulate one of the main symptoms of schizophrenia: hallucinations. Obviously, hallucinations refer to different senses; there are five types of hallucinations. But here we are focusing on auditory and visual hallucinations,' Dr Alexei Sammut, Lecturer of Mental Health at the Faculty of Health Sciences, says.

Hallucinations impact all the five senses: auditory, hearing sounds and voices; visual, the second most common type when people see things that are not there; tactile, when an individual feels a sensation of touch; olfactory, such as smelling malodour; and gustatory, when tasting is affected by hallucinations.

Additionally, this project can be included in therapy. If a schizophrenic person becomes the 'player' of this experience, they can learn how to accept and function with their chronic condition. 'Once you do not resist these voices but start understanding and accepting these voices, then their impact is reduced, which can improve quality of life,' Sammut explains in a nutshell.

ARTIFICIAL INTELLIGENCE AND MENTAL HEALTH

But how does AI tie into the big picture? Using smartwatch technology or similar monitoring, AI can learn about the vitals, such as heart rate or blood pressure, of the 'player' to make sure that the environment they are experiencing is just as engaging as it should be. 'If the player is getting bored, the AI will pump up the game a little bit. If they are super excited, the AI will wind it down a little bit,' Dingli says.

When using the technology with schizophrenic people, it is necessary to be very careful and alert. 'If the individual is experiencing hallucinations and we are actually

increasing these hallucinations with the VR environment without being mindful about and reactive to the patient's needs, that will have a detrimental effect,' Scerri explains. Normally the virtual experience would focus on the hearing voices approach because that is where a dialogue can be built between the person and the different voices. AI can also help here in making sure that the conversation between the individual and the generated voices is just demanding enough to be manageable for the person.

In such a scenario, a psychologist can monitor and intervene when they see fit. In fact the voices can also be controlled by a psychologist, ensuring that the discussion between the individual and the voices is in reality a discussion between the patient and the medical professional, while the VR world represents it as if it was reality.

The AI also helps in making sure that the user cannot avoid unpleasant experiences. 'Imagine that first you,

Following the user input from the first project, and the experiences the researchers have gathered, the potential of a further developed digital solution is limitless both for patients and the general public.

as the player, go and speak to the receptionist, which triggers hallucinations. But if you decide to ignore the receptionist and keep going to your desk, something else will happen, like a telephone will start ringing, which will eventually trigger a hallucination,' Dingli explains. Therefore, even though the users are unaware, the AI is triggering the educational, awareness-raising, or therapeutical — depending on the player — events.

Showing such results, the project has immense potential to move beyond professional education toward raising awareness among the general public. Bringing such an experience to people would help with fending off the stigma of mental health issues.

Unfortunately, the follow-up project which targeted a much wider audience for awareness-raising never received funding, and development is still pending. Today, this is the most crucial issue for progressing the project beyond education to the education of the public and therapy for individuals with mental health issues.

Following the user input from the first project and the experiences the researchers have gathered, the potential of a further developed digital solution is limitless both for patients and the general public. The immersive experience of the VR solution can illuminate people on how schizophrenia manifests in the everyday life of their peers. Additionally, it can be implemented in therapy to help schizophrenic people handle and live with their condition. Moving beyond VR and utilising AR in the long run, which would mean that the real, physical world is embellished by virtual objects and sensations, could expand the beneficial effects of the technology exponentially. T