

Experiencing dementia symptoms in VR (Demo)

Video Link: <https://www.youtube.com/watch?v=b-G7ZTk5Mtk>

PROJECT DESCRIPTION.

This project consists of a single room for the experience and aims to serve as a demo to showcase the potential for a full-fledged experience with additional rooms, events, effects, and dementia-related situations. The experience will use a kitchen scenario where the user enters after getting up for breakfast. An AI-generated voiceover will narrate (in first-person style) what might be going through the mind of a person with dementia, aiming to express directly to the user what it feels like to live a moment like this in the life of an affected individual.

During the experience, the user will appear in the kitchen after having closed the door upon entry. There will be key points in the room to move to in no predefined order, where events will unfold to represent first-person narrated situations. This will bring the user as close as possible to how these situations are experienced by an elderly person affected by dementia. Once all events are experienced by the user, the experience will conclude with a first-person reflective narration, where the character will comment that they should call one of their sons/daughters to tell them he might need someone by his side for additional help in his day-to-day life.

The symptoms and situations to be represented are described below.

- **Spatial confusion and disorientation:**
 - Alteration of objects and environment in such a way that surfaces, like the kitchen table, slowly change while being observed. There will be a narration in the first person about what is happening.
 - Objects on the table change position, causing the user difficulty when trying to interact with them. First-person narration will convey the attempts and disorientation.
- **Difficulty remembering tasks or recent events, as well as recognizing faces:**
 - The kitchen door opens or closes automatically at intervals to depict short-term memory loss, with first-person narration about the attempts to recall if the door was closed or not.
 - A picture frame with a family photo will be in the room. At a certain point, upon looking at it again, the faces become unrecognizable, and the narration expresses the momentary forgetting of family members' names.

- **Sensory distortions:**
 - Dementia can cause certain sounds to be perceived as disturbing or distant. This could include a faucet that suddenly starts running after it was previously turned on but forgotten (merging the inability to remember completed tasks) with the sound of water increasing in volume and becoming distorted before returning to normal after a few seconds, accompanied by the task of turning it off again. All of this will be narrated in the first person to give the user a better understanding of the symptoms.
- **Language and communication issues:**
 - To simulate aphasia (difficulty understanding of speaking and written words), a note left by a grandchild in the kitchen says how much they love him and that the grandchild will return tomorrow for a visit. The reading initially appears clear and orderly, gradually becoming chaotic and disordered, making it nearly impossible to discern the message from the grandchild.
- **Mild anxiety and paranoia:**
 - To simulate the anxiety or paranoia some people with dementia feel when in familiar environments perceived as hostile, visual and/or auditory elements will be generated at a certain point to create a feeling of “being watched” or “followed” (without reaching total fear), accompanied by first-person narration describing that feeling.
- **Throughout the experience, elements of symptoms affecting vision will also be incorporated, such as:**
 - Changes in brightness and light intensity.
 - Distortion of the field of vision, creating a vignette around it.
 - Shifts in color intensity perception.
 - Visual acuity changes, including grain or noise at certain points in the experience.

TECHNICAL DETAILS

The experience will be created in Unreal Engine 5.3.2, using the Oculus Quest development version from their GitHub fork.

For the demo, assets from the Epic Store (FAB) will be used to create the kitchen environment, resembling the look shown below (given the performance limitations of the Oculus Quest 2, the environment's detail and quality may need adjustment).



The environment will be navigable with Oculus Quest 2 controllers, allowing the user to move around the kitchen, grab and release certain objects, and interact with necessary items for the experience.

The first-person narration voice will be created with AI from Elevenlabs (Text to Speech), a leading provider, to ensure detailed and humanized narration of high quality with a professional subscription.

This VR experience will be fully compatible with the following VR headset models (as long as they maintain the current Android system):

- Oculus Quest 2
- Oculus Quest 3
- Oculus Quest 3s

The project will be delivered in a compressed GIT repository with the full commit history and corresponding branches, including an APK package installed on Oculus Quest 2 VR glasses provided by the client, which can be installed on as many VR headsets as necessary using Oculus software.