



BreachingVR: A Simple VR Software Demonstration to Reconstruct Harold Garfinkel's Inverting Lenses Tutorial Exercise

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Abstract

The article reports on a simple working demonstration in virtual reality (VR) of the inverting lenses tutorial exercise by the sociologist Harold Garfinkel. A user wearing a virtual reality headset can vertically invert their visual perception of the physical world around them (via the video camera pass-through) or invert their perception of a virtual world in which they can pick up virtual objects and use virtual tools.

Keywords

Ethnomethodology, Harold Garfinkel, Virtual reality, Head-mounted display, Tutorial exercise, Inverting lenses, Software

1. Introduction

We describe the background to, and motivation for, a simple demonstration in virtual reality (VR) of the inverting lenses tutorial exercise by the sociologist Harold Garfinkel. A user wearing a virtual reality headset can vertically invert (field reversal) their visual perception of the physical world around them (via the video camera pass-through) or invert their perception of a virtual world in which they can pick up virtual objects and use virtual tools. Thus, anyone with the relevant technology can experience the inverting lenses tutorial exercise from the comfort and safety of their own home (while in lockdown, perhaps). The demo is intended as an exemplar of how software combined with an immersive video technology can enable a digital reconstruction of a minor, but historically significant, methodological research practice in qualitative sociology.

2. Description

Inverting lenses have been used by psychologists and phenomenologists since the late nineteenth century (Linden et al 1999; Merleau-Ponty 1945/2012; Stratton 1896, 1897). Merleau-Ponty (1945/2012: 255) writes that “if a subject is made to wear goggles that turn the retinal images upright, then the whole landscape at first appears unreal and inverted. On the second day of the experiment, normal perception begins to be reestablished, except that the subject has the feeling that his own body is inverted.” It appears from the record that Garfinkel intentionally ‘misread’ Merleau-Ponty’s phenomenological account of the experience of wearing the inverting lenses for a long period of time. Quére (2012: 307) notes “a net continuity in Garfinkel’s use of a phenomenological background, despite the fact that there has been an evolution, even a twist, in such a use — his references being more and more to existential phenomenologists (Heidegger, Gurwitsch or Merleau-Ponty) and less and less to Schutz. Though Garfinkel tried to misread those phenomenologists’ texts in order to reach the Gestalt phenomena in the ‘phenomenal field’, those references show how deep was Garfinkel’s adherence (after the Studies) to the main catchwords of existential phenomenology, and to its use of Gestalt psychology.” Garfinkel (2002: 177) himself contends that his “purpose, by deliberately misreading Gurwitsch and Merleau-Ponty, is to appropriate to the interests of EM [ethnomethodology] investigations and its policies and methods, the topics and themes of Gestalt phenomena that Gurwitsch and Merleau-Ponty describe as the achievements of their investigations. I give them the EM name: ‘a figuration of details’.”

Instead, Garfinkel devised a tutorial exercise for his students to generate disruptions, some of whom have given anecdotal accounts. Ken Liberman (personal communication) reports that “What excites him [Garfinkel] most about the inverting lenses is that they bring attention to the *embodied* nature of our circumspective practices, as we stretch our hands along a wall in order to discover where we are and where and how we can go next, picking up clues from what sense our eyes are able to make of the hands against the wall. (Only after some time do ‘the’ hands become ‘our’ hands again.) Also, they reveal thinking as ALWAYS being *in-the-course* of doing something and never remote or independent from actions.” To illustrate this, excerpts from a technical and narrative description of Garfinkel’s inverting lenses tutorial exercise (from Garfinkel 2002: 207-210) in his own words are given below.

“Inverting lenses made available as revealed details of witnessable and inspectable demonstrations the phenomenal fields of ordinary human jobs. With them we came upon the properties of lived, phenomenal details of instructions and instructed actions, and that these details are chained to the hopeless embodiment of the parties to that setting.

The lenses made it possible to examine these jobs in and as chiasmically, stable, unremarkably achieved, cogent and coherent details of practical action.”

The photograph in Figure 1 shows the type of helmet and hood incorporating the inverting lenses that the students wore.



Figure 1 - The helmet/hood arrangement worn by students. From Garfinkel (2002: 208).
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Garfinkel continues with an example:

“In the photo [see Figure 1] Maryann has the mask on. She and Jerry are in a backyard; the low wall is alongside them. Jerry has said to her, “Maryann sit over there.” He does this gesture (points), “Maryann sit over there.” Maryann, with the lenses on, reports, “I can see Jerry, but I don’t know where he is.”

In Figure 2, a photograph shows one of the students being recorded while attempting to follow instructions, as Garfinkel elucidates below.

“In the photo [see Figure 2] she is alongside the wall; after Jerry says this she turns to the wall, and she is doing this (pats wall): she asks as she pats the wall, “Here?”, he says, “No.” She pats, “Here?” “No.” She is not looking at him. She pats, “Here?” “Yes.” She is trying to find by patting the wall what she cannot find when she goes looking to find Jerry and to see Jerry pointing to the place where she should sit. So, here we have a first thing that comes up about what it is to be finding the intelligibility, and by looking for and looking at something listened to and heard, to find the followability of an instruction as the most ordinary thing in the world.

So, you come to the party, the hostess greets you, “Please sit down”, and there’s the welcoming gesture. What Maryann cannot see is what Jerry is doing with his eyes that makes up seeably when she looks for it the fact that his eyes in an examinable gazing have a destination. Also, she cannot see when he points that the pointing is a gesture such that she is trying to *pick it out* of an assemblage of phenomenal details that can be examined to find the *direction* of the point, and that the direction itself has a followable and findable destination. She cannot see from where she is standing that a wall alongside her finds Jerry positioned in a place at the end of it and there he is seeably facing her relative to the wall that runs alongside her to her right, alongside him to his left. With the lenses use we come upon here, this collection of what? We’ll gloss them



Figure 2 - Following instructions. From Garfinkel (2002: 208).
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as directional and orientational properties -- of path, wall, furniture, bodies, heads, faces, arms, ‘sounded doings’, hands fingers, gaze-glossed and thereby not seen or seeable again as the ‘garden setting’.”

Garfinkel concludes:

“But the inverting lenses promise that indeed there is an invariant. There is a structure in those phenomenal details. There are constancies. But they are not to be found by introducing generic representations into the *in vivo* stream of practices. Instead, they are endogenously provided for by the local parties who staff the achieved phenomenon.

And because they are so provided for, they are somehow, by us, to be found, endogenously.”

Lightweight versions of such goggles with physical inverting lenses are available nowadays (see Figure 3). Despite the availability of a specialised mechanical solution, there is some merit in reconstructing the equipment needed for such a tutorial exercise within a generalised immersive technology (VR) for persons in both a physical and a virtual world. That is the motivation for our demonstration, a simple application of digital maker culture to an ethnomethodological or phenomenological problem.



Figure 3 - Demonstration of how blinking looks in upside down goggles.
en.wikipedia.org/wiki/File:Blinking_in_Upside_Down_Goggles.gif

3. How to use *BreachingVR*

The software demo is called *BreachingVR* (v2.0.2) for the simple reason that the name has more descriptive force than *TutorialExerciseVR* or *InvertingLensesVR*. Arguably, there is some overlap between the phenomenologically inspired tutorial exercises as a methodological spur and Garfinkel’s breaching experiments that rupture trust in the social order.

3.1. Requirements

To try the demonstration software, a commercial VR headset (and controllers) is required. Note that this demo is designed to work specifically with the *HTC Vive Pro* VR headset. It should be installed with SteamVR on a VR-ready PC or laptop with

Windows 10. *BreachingVR* may work with other headsets compatible with SteamVR, but the real world demo is dependent on the external 2D video camera feed from the VR headset. Not all headsets have a 2D camera feed and not all 2D video camera feeds are interceptable by the software in the same way.

3.2. How to install and use

Download the latest release build from GitHub and run the “breachingVR.exe” file.¹ Note that you may have to give permission to let the Windows operating system execute it as an unregistered executable programme. Use the keyboard to control the user interface in the HMD:

- Switch between virtual scene and physical camera with the RETURN key on the keyboard.
- Flip or revert the image with the SPACE key.
- Use the left and right arrow keys (← →) to adjust the disparity when the 2D camera pass-through images for each eye are not correctly aligned.

Since the VR headset is designed to stop light from entering, you will find that you do not get any extra *visual* cues about your bodily orientation in the physical world. This is desirable. The inverted viewport in the virtual world is undistorted. However, you may find the camera pass through on the VR headset to be distorted whether or not it is inverted.

In the spirit of Garfinkel’s narrative, enrol others to give you instructions, such as “Please sit down here” if there is furniture within the physical play area that the VR user can move inside safely. Try and move about the virtual space and pick up and manipulate objects (see Figure 4), such as a bow and arrow, blocks, handles, switches, etc. Unless you wish to wear the VR headset for a substantial period of time so that you can notice adjustments in your vision, it is recommended that you take frequent breaks.

¹ <https://github.com/BigSoftVideo/BreachingVR/releases>.



Figure 4 - Trying to pick up a virtual object while vision is inverted in BreachingVR.

It does not take long inside *BreachingVR* to experience the disruption in our perception of the physical world that Garfinkel is after. Unfortunately, it can be stressful for those who experience *both* VR sickness *and* a visually induced motion sickness that one can also suffer from while using mechanical inverting lenses.

If you have any bug reports or fixes, then please add an issue and/or pull request to our public GitHub code repository.²

4. Conclusion

The goal of this article is to introduce and document an uncomplicated application of digital maker culture to an intriguing sociological exercise. How a reader wishes to use the software beyond the embedded performative re-enactment of a novel and original demonstration is not for us to say. We will conclude with one methodological point drawn from our experiences. After trying it yourself as a tutorial exercise, it is demonstrative that “a first collection of things we learn with them is the massive

² github.com/BigSoftVideo/BreachingVR.

relevance of the achieved coherence of phenomenal details of embodied jobs. These are practical activities. Think of these as jobs of bodies – not anatomists’ bodies, or biologists’ bodies, but work’s bodies. The *bodies of practices*. These bodies have eyes that are skills; eyes that are skills in the ways that eyes do looking’s work. Where seeing is something more, other and different than formal analytically describable positioning the orbs to assure certain retinal registration of a perceptual field, let alone a visual field” (Garfinkel 2002: 210). In addition, we would argue, the exercise also reveals the jobs of *virtual work*’s bodies and the *virtual* bodies of virtual practices that immersive VR technology attempts to sustain *as if* by aligning computationally the “formal analytically describable positioning the orbs to assure certain retinal registration of a perceptual field”, with varying degrees of success as a practical, achieved figuration of details, always in-the-course of doing something. Given that the ‘something’ is open-ended, we propose that immersive *virtual* reality technology is a productive platform for generating a range of tutorial exercises with regard to audio-visual perception, embodiment and social action.

Acknowledgements

We wish to thank Jacob Davidsen for testing *BreachingVR* and not complaining too much about the resulting sickness he experienced.

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