# On Dani Ploeger's *Hysteresis*

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## Introduction

This chapter is about a VR art installation called *Hysteresis* (2022) by Dani Ploeger and I want to relate this piece to three different genealogies, namely that of vehicle simulation, that of car pop culture and finally that of the fog machine.[1] I want to start with a helpful statement from Dani Ploeger's website:

> »HYSTERESIS consists of a bumper car that was modified in collaboration with drivers in Zeeland, a rural region in the Netherlands. The car is equipped with a virtual reality headset and accompanied by a video projection. After a virtual race in a Golf Mk4 along a dike road, a tuner talks about his car. Meanwhile, a video of a burnout is projected, repeating endlessly with a Mk4. Burnouts are performed to warm up the tires for a drag race, as a spectacular public intervention and in memory of fellow tuners who have died in accidents.«[2]

Or as Annette Urban, Julia Reich and Manuel van der Veen describe it:

> »In *Hysteresis* (2022), Dani Ploeger consolidates this merger between different media and between different senses: in addition to a VR in a bumper car, he installed incense burners, a video loop showing a Golf Mk4 doing a burnout, and a fog machine that enveloped visitors in smoke. Sitting in the

1 Regarding this work I have to make a disclaimer – unfortunately, I was not able to see it installed, that is why I have to take recourse to still images, videos and descriptions. See the website of Dani Ploeger for helpful materials and videos: https://www.daniploeger.org/hysteresis (last access: 10.07.2025).

2 Dani Ploeger (2022a): »Hysteresis«, in: daniploeger.org. Online: https://www.daniploeger.org/hysteresis-statement (last access: 10.07.2025).

> bumper car and with the VR goggles over the eyes, one found oneself, as expected, in the passenger seat of an accelerating car, while sound, smell and wet fog bridged the distance between the worlds. The virtual ride ends with a violent crash into a tree, which Ploeger uses to provoke the abrupt end of the passthrough. But despite the physical shock, visitors are not simply catapulted out of the VR; instead, they look back at the exhibition ensemble, which at first seemed intrusive, as if at a memorial ceremony for the virtual accident.«[3]

In the following I want to analyze this installation, especially regarding what it might say and show in relation to Virtual Reality. At first, it has to be remarked that the installation evokes at least three different genealogies – except from the history of installation art as such (which I will mention later, albeit shortly):

1. The genealogy of vehicle simulation
2. The genealogy of, what I call in lack of a better term, car pop culture
3. The genealogy of the fog machine.

In 4) I will describe the several structural oppositions that are central to Hysteresis. In 5) I will draw a short conclusion.

## 1. The genealogy of vehicle simulation

The use of a head-mounted display (HMD) in which a virtual ride is displayed while sitting in a real vehicle seems to quote the genealogy of vehicle simulation which has been a very important technology for many years. Many authors start the genealogy of virtual reality with flight simulation.[4] In the highly technologized world of modernity a ›simulation space‹, a simulation infrastructure, must partially and approximately duplicate this world – in order for this world to function at all, because we are surrounded by high-risk technologies.

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3 Julia Reich/Annette Urban/Manuel van der Veen (2023): »passthrough. Von Portalen, Durchblicken und Übergängen zwischen den (virtuellen) Welten«, in: kunstforum.de (07.2023). Online: https://www.kunstforum.de/artikel/passthrough/ (last access: 10.07.2025), n.p., my translation.

4 See for example the early book by Benjamin Woolley (1992): Virtual Worlds, Oxford: Blackwell Publishers, Ch. 2.

Airplanes, nuclear power plants, high speed trains and many more can only be used by trained subjects – otherwise catastrophes might occur.[5]

As Virilio emphasized, every new technology is inevitably accompanied by a new type of accident – like the car accident shown in *Hysteresis*. It is therefore equally to be expected that additional techniques will be invented to prevent accidents or at least make them less likely – simulators are such techniques, but Virilio does not mention them.[6]

The history of flight simulation is mostly dated back to the »Link Trainer«, invented around 1931.[7] Jeon remarks on simulative subjectivity:

> »[The] Link Trainer connected flight as action and flight as representation – flying and ›flying‹ – providing a space for the two forms to shape each other. […] Again, a new kind of pilot was implicated in the practice of instrument flying: those who could ›believe in their instruments rather than themselves.‹ It meant a transition from ›natural pilots‹ with feel and intuition to ›mechanical pilots,‹ […] For almost five years after its first invention, however, Link's own flying school was the sole user of the trainer for flying instruction. A majority of its early sales went to amusement parks, and there were only a few purchases from aviation-related organizations.«[8]

Jeon mentions an important point, that already played a role in Link's patent. Link introduced the trainer, besides many other potential uses, as »entertainment apparatus for profit«.[9] And obviously a lot of the entertainment media today, think of certain types of computer games, are based on simulations.

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5 Jens Schröter (2025): »Fictional Infrastructures«, in: Markus Gabriel/Marion Gymnich/Birgit Ulrike Münch (eds.), Wirklichkeit/Fiktion. Spannungsfelder eines Verhältnisses, Tübingen: Mohr-Siebeck, pp. 261–275.

6 Paul Virilio (2005): L'accident originel, Paris: Éditions Galilée.

7 See B. Woolley: Virtual Worlds, Ch. 2.

8 Chihyung Jeon (2015): »The Virtual Flier: The Link Trainer, Flight Simulation, and Pilot Identity«, in: Technology and Culture 56/1, pp. 28–53, here: p. 30 and 33.

9 E. A. Link Jr. (1931): »Combination Training Device for Student Aviators and Entertainment Apparatus«, US Patent 1,825,462.

*fig. 1: Dani Ploeger: Hysteresis, 2022, modified bumper car, VR headset, video projection, smoke machine, car tires, burnt rubber (above: VR view; below: installation view)*

Virtual Reality (VR), in a sense, emerges from such simulators, as its name already suggests. It is connected to reality, but it is virtual at the same time.

A simulated plane or car must behave like the real one, otherwise you cannot be trained for the real use. However, if you have an accident – as in the video in the HMD in Ploeger's installation – you should not die, otherwise simulators are useless. What we call VR today is mainly the fictionalization of simulated space, that is virtuality and fictionality are combined.[10] The reality effect is used, but combined with fictional content. That is basically still the dispositive of many VR artworks.

Although the HMD in Ploeger's work alludes to VR, it is of course not a simulator in any strict sense. The viewer in the bumper car does not steer the virtual vehicle. The person just sits there and watches the immersive video with the HMD. A structural opposition appears here between the real viewer and the implied viewer (because the implied viewer steers the virtual car). This is only the first of a series of structural oppositions that are constitutive for the whole installation, which is a kind of heterogeneous ensemble. Now, there are elements in the installation that obviously do not come from the genealogy of simulators, but clearly more from the genealogy of »amusement devices«.

## 2. The genealogy of car pop culture

Bumper cars are a well-known and, as far as I can tell, still existing amusement apparatuses. In a way they share some properties with vehicle simulation, although they are obviously not intended as »control environments«[11], as simulators are. They are fun environments. You drive a vehicle around, even bump into other vehicles – which would be an accident in the case of real cars. Bumper cars are not used to train anyone to not bump into other vehicles. Bumping is allowed, but of course that does not mean that no accidents can happen with bumper cars on a secondary level, actually they do.

10 See Jens Schröter (2004): Das Netz und die Virtuelle Realität. Zur Selbstprogrammierung der Gesellschaft durch die universelle Maschine, Bielefeld: transcript, pp. 211–215.

11 S. R. Ellis (1991): »Nature and Origins of Virtual Environments. A Bibliographical Essay«, in: Computing Systems in Engineering 2/4, pp. 321–347, here: p. 327. Ellis means with his notion »control environment« that simulator technology is normally used to train people to use potentially dangerous technologies (like airplanes, nuclear power plants, high speed trains, but nowadays even in some driving schools simulators are used). Simulators are used to control the future usage of such technologies, to discipline subjects into being appropriate users.

Bumper cars may be viewed as part of a popular culture of the car, an important part of second half 20th century pop culture.[12] *A Streetcar named Desire* – such a movie title would not have been possible without that kind of popular culture. Of course, also McLuhan, in the car-crazed US, had to write some pages on the car in *Understanding Media* from 1964, with remarkable sentences like: »The simple and obvious fact about the car is that, more than any horse, it is an extension of man that turns the rider into a superman: It is a hot, explosive medium of social communication.«[13] At least it is true that in certain fan and tuning subcultures cars are an ›explosive medium of social communication‹ (and perhaps also when car drivers direct their aggressions against each other). In these cultures every property of a car is discussed and even a ›burnout‹, the smoking tires we can see in the video for *Hysteresis*, becomes a communicative tool, e.g. being a reminiscence to fellow tuners that have died in accidents. The use of the ›burnout‹ is also interesting because Ploeger wrote a book on »everyday technologies in extreme circumstances«:

> »I have been interested in the ways in which everyday technologies are used and appropriated under circumstances that their designers and manufacturers did not envisage and in ways that do not correspond with their usual representation in advertising and other media. […].«[14]

Although, unfortunately, Ploeger does not discuss car cultures, simulators, bumper cars or fog machines (I will come to that later) in his book, we can cling to his remark that one of his central interests is:

> »[e]xamining the ways in which technologies that were designed, produced and marketed for use in everyday consumer culture start to (mal)function, gain new meanings and are appropriated in these liminal spaces can give us hints at what technology beyond global consumerism could look like.«[15]

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12 See David Thomas/Len Holden/Tim Clayton (eds.) (1998): The Motor Car and Popular Culture in the 20th Century, Aldershot a. o.: Ashgate.

13 Marshall McLuhan (1994): Understanding Media. The Extensions of Man, Cambridge, MA/London: MIT Press, p. 221.

14 Dani Ploeger (2021): Deserted Devices and Wasted Fences. Everyday Technologies in Extreme Circumstances, Axminster: Triarchy Press, p. 1.

15 Ibid., p. 2.

That is: the way in which technologies were designed and how they are appropriated is a relevant perspective to understand his work – although admittedly simulators and bumper cars are not strictly everyday technologies, and an art installation is perhaps not the kind of extreme circumstance Ploeger envisions. Anyway: In the context of Ploeger's cooperation with the Netherlandish tuning community cars are brought into extreme circumstances. And his cooperation includes that community of practice, which is at the same time a fan community, into the installation. Moreover, the tuning of cars is an appropriation and modification of car technology, sometimes even beyond the limits of what is allowed by the law. A burnout is an extreme circumstance for a tire. The tuning community has without doubt a certain transgressive moment, which reminds one immediately of J. G. Ballard's novel *Crash*. This remarkable aestheticization of the car is often linked, because of its topic, people that become sexually aroused by having accidents, to McLuhan's thesis that media are extensions of men or even more, as he writes in his chapter on cars in *Understanding Media*: »[M]en have always been the sex organs of the technological world. The car is no more and no less a sex object than the wheel or the hammer.«[16] The central figure of *Crash*, Vaughan, is a kind of outlandish media studies professor and in one scene the characters view films of »slow-motion films of test collisions.«[17] The narrator speaks also of »simulated collisions we had seen at the Road Research Laboratory.«[18] In *Crash* ›simulated‹ is a quite frequent word, connected to the car-machine and the body-machine at the same time.[19] The exhaustion of the tire in Ploeger's *Hysteresis* is a metaphor for a Bataillian transgressive excess that undermines the purpose of simulation to produce controlled environments and the purpose of bumper cars to allow safe bumping. There is a tension between the symbolic taming of the real and the transgressive reconnection to real danger – the smoke of the burnout tire is a concise sign for this, since smoke has always been seen as an indexical sign for fire and fire is the danger for the stabilized normality par excellence, an all-consuming force that

16 M. McLuhan: Understanding Media, p. 220.

17 J. G. Ballard (1973): Crash, London: Jonathan Cape, p. 8.

18 Ibid., p. 147.

19 Ibid., p. 61, 73 (in relation to a haircut), 85 (in relation to wounds), 97 (»technology of accident simulation«), 98 (»simulated crash«), 133 (skin colours of whores), 140 (juvenile anuses), 147. Sometimes simulation is related to car technology, sometimes to the body. This shows how the machine and the body are part often the same discursive chain for Ballard.

disrupts every order. The represented smoke of the tire obviously connects with another element of the installation: the fog machine.

## 3. The genealogy of the fog machine

Another part of Ploeger's installation *Hysteresis* is a fog machine.

> »A fog machine, fog generator, or smoke machine is a device that emits a dense vapor that appears similar to fog or smoke. This artificial fog is most commonly used in professional entertainment applications, but smaller, more affordable fog machines are becoming common for personal use. Fog machines can also be found in use in a variety of industrial, training, and some military applications.«[20]

The military uses might be: you can use those machines to hide military structures on the ground by producing synthetic fog, or you can train soldiers on how to orient in difficult situations in which visibility is constrained. But most of us know fog machines from concerts of rock and pop bands and perhaps also from electronic dancefloor clubs etc. Kittler writes: »A fata morgana machine that can now be had around the globe. Without war, simply by paying an admission fee. For mechanization has also taken command over so-called times of leisure and peace.«[21] He then mentions the »discotheque«: »Deaf, mute, and blind, bodies are brought up to the reaction speed of World War n+I, as if housed in a gigantic simulation chamber. […] Every culture has its zones of preparation that fuse lust and power, optically, acoustically, and so on. Our discos are preparing our youths for a retaliatory strike.«[22] Again, the notion of simulation is used – simulators are of course also ›zones of preparation‹. Bumper cars are a perfect example for mechanization taking command over leisure and pleasure. And surely, in the discotheque, the combination of deafening loud music, flickering lights and a fog machine produces a war like atmosphere, in which the senses are overwhelmed by explosions. So, using a

20 Wikipedia (2025): »Fog Machine«, in: wikipedia.org. Online: https://en.wikipedia.org/wiki/Fog_machine (last access: 10.07.2025).

21 Friedrich Kittler (1999): Gramophone, Film, Typewriter, Stanford: Stanford University Press, p. 140.

22 Ibid.

fog machine evokes settings with potentially disturbing effects on the sense organs – another case of »extreme circumstances«.

The fog machine produces a simulation of the smoke of the burnout tire and itself quotes the genealogy of zones of preparation, in which visibility is reduced. By introducing this hindrance to visibility into the installation, Ploeger also thematizes the fundamental problem of all visual art – the relation of the visible and the invisible. It is worth remembering that the cloud, due to its fuzziness, its permanently changing shapes and its role in blocking to the view onto the sun, the moon and the stars – think of Damisch's impressing study *A Theory of /Cloud/* – also marks a special problem in the history of representation.[23]

## 4. The structural oppositions in *Hysteresis*

After discussing some of the elements that are used in *Hysteresis*, I want to delve deeper into the analysis of the installation. The work is organized around several structural oppositions:

- the opposition between the public visible projected video image and the first-person image in the HMD
- the opposition between the filmed fog of the burnout and the real fog of the fog machine, implying what Urban, Reich and van der Veen rightly pointed out when emphasizing »sound, smell and wet fog bridged the distance between the worlds«[24]
- the opposition between the filmed car and the real bumper car – and implying the opposition between car (›serious technology‹) and bumper car (›amusement device‹). A difference that is repeated in the VR setting between ›serious‹ simulation and (fictionalized) ›simulation for fun‹
- the opposition between the filmed car and the virtual car of the HMD animated video sequence
- the opposition between the space of the video, the simulated space and the real space

23 Hubert Damisch (2002): A Theory of /Cloud/. Toward a History of Painting, Stanford: Stanford University Press.

24 J. Reich/A. Urban/M. van der Veen: passthrough, n.p., my translation.

- the opposition between the bright light illuminating the installation and the filmed light in the video and the implied light in the VR sequence
- the opposition between visibility and invisibility

Why do I stress this complex ensemble of oppositions so much? Because I think that the art form of installation, under which I subsume Ploeger's *Hysteresis*, has a special affinity of exposing several medial oppositions. Installations spatially combine different media and materials, which allows for different spectatorial positions at the same time. One example: The person in the bumper car wearing the HMD and the persons watching the installation from the outside are perhaps asking themselves, if the video they see is the same video that can be seen in the HMD – what is often the case in VR installations.

I would suspect that the whole concept of such installations is exactly to expose the viewers to such oppositions. Bishop speaks of »the multiperspectivalism implicit in installation art.«[25] Otherwise, the co-presence of heterogeneous elements would make no sense. But what might be the specific operations in this case? Since it is a VR installation we can assume that one central concept is to contrast and compare real and virtual space. However, that is in a way true for all such installations that combine a VR presentation, displayed through a HMD, with other elements – and to recall: we can find at least three central themes in *Hysteresis*:

- Simulators as training- and disciplinary-technology, but also as entertainment
- Popular car culture
- The fog machine and its cultural repercussions

The general contrast and comparison of virtual and real is realized here in a specific way: Although the use of HMDs and of virtual space always connotes its genealogy in simulation and simulators, these connotations are combined here with bumper cars, popular car culture and the fog machine. Thereby entertainment and the use of technology against the grain, so to speak, is foregrounded. At the same time, e.g. the contrast between the filmed fog and the real fog underlines the distance between real space and the diegetic space of film as does the HMD in the bumper car underline the distance between real space and the virtual space of simulation. Also, the filmic and the computer-generated space

25 Claire Bishop (2005): Installation Art, London: Tate Publishing, p. 54.

are put into contrast. None of this really fits together: The fog in the video is also chemically different from the fog of the fog machine. The bumper car cannot be steered, as is possible when used as an amusement vehicle; the virtual space witnessed in the HMD is not an interactive space as it normally is. Moreover, the fog from the fog machine temporarily clouds the scenery in the installation and problematizes the role of visibility as such. The fog of the fog machine therefore also evokes, when related to the hyper-perspectival HMD again, the extreme opposition between order and its other. That these different oppositions cannot be smoothly reconciled is not a deficit of *Hysteresis,* but the precise way in which the installation holds open the meanings of the real and the virtual and puts them in constant exchange.[26] We have several – multiperspectival – different subject positions accordingly: We have the driver in the video who burns out the tire, the POV of the camera, we have the person in the bumper car, the POV of the virtual image in the HMD, and finally the observer of the whole installation. In that sense the installation multiplies different points of view. This may be read as a meditation of the complexities of simulative subjectivity.

## Conclusion

Finally, the questions of all questions: Why is it called *Hysteresis*? In a text on Ploeger's work we can read:

> »Hysteresis – ›The energy that is lost and not returned when tire materials are stressed in either direction. The lost energy is converted by molecular interaction into heat, and since rubber has poor heat conductivity, the internal temperatures of a tire can increase rapidly‹ (The Automobile Lexicon)«[27].

In a technical paper on »Vehicle dynamics with brake hysteresis« we can read: »Braking is a key action to ensure the safety and stability of vehicle motion; a

26 Cf. Gilles Deleuze (1995): Difference and Repetition, New York: Columbia University Press, p. 100: »We see both that the virtuals are deducted from the series of reals and that they are incorporated in the series of reals.«

27 Dani Ploeger (2022b): »Hysteresis, Dani Ploeger«, in: art-claims-impulse.com. Online: https://www.art-claims-impulse.com/de/hysteresis-dani-ploeger-de (last access: 10.10.2025), my translation.

reaction delay due to hysteresis can be very critical.«[28] Again: the accident and the possibilities to react are centrally relevant. We can interpret hysteresis as a kind of deferred resistance of materials – in that sense it is similar to the notion of feedback, to the answer a system gives to a subject (or to another system), depending on earlier interactions. In that sense, with the title »Hysteresis« the installation points to the resistance of non-human actors that can even be dangerous and at the same time to its own interactive elements. In emphasizing dangerous materiality, the limits of virtual simulation are highlighted. Actually, after a crash in a virtual car race, like the one that can be seen in the HMD in *Hysteresis*, one can start all over again. That is the whole point of simulation – to be reversible. The same is with the fog: The fog from the machine dissipates irreversibly; the fog in the projected image can be repeated again and again. The installation is not just a memento mori for a potentially crashed driver transferred to the gallery space. And why should this be interesting? Rather, I think, it can be read as a complex meditation on the place of virtual space, of simulation, of training, between serious uses and entertainment, between the virtual and the real.

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28 Barys Shyrokau/Danwei Wang/Klaus Augsburg/Valentin Ivanov (2012): »Vehicle dynamics with brake hysteresis«, in: Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering 227/2, pp. 139–150, here: p. 139.

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fig. 1: Courtesy the artist