
The Real Law of Virtual Reality

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Two thousand sixteen is the year virtual reality (“VR”) and augmented reality (“AR”) started to take off. We’ve seen a deployment of a number of major platforms. A lot of people are using VR. So far, they’re using VR for games. By and large, it is a gaming platform. There’s a tendency to dismiss it for that reason. I’ll talk more about that in a minute. I think that’s a mistake. Gaming actually is probably one of the most significant social phenomena of our time, and I say that in part because I’m a gamer. But in part it is because gaming has real economic significance and because it has real social significance.

That said, even if you don’t believe that, you still shouldn’t dismiss VR just because it is about gaming. It is about to be about a lot more than gaming. Virtual reality is already giving us immersive news reporting — the ability to actually put yourself inside a story in a way that the current media just doesn’t permit. It’s about communications, virtual interactions with someone in a distant part of the world. That can happen in ways you already can’t do on the Internet — even with a large video conferencing set.

It’s about the creation of 3D art, architecture, and design — the ability to stand inside your work of art, both in making it and experiencing it.

It’s about enhanced real-world information, about a near-future world in which I’m going to be able to walk up and say hello to you

[†] Copyright © 2017 Mark A. Lemley & Eugene Volokh. This is a transcript of a speech given by one of us (Lemley), and reads like it. It is based on an underlying co-authored work with Eugene Volokh at UCLA. Mark A. Lemley & Eugene Volokh, *Law, Augmented Reality, and Virtual Reality*, __ U. PA. L. REV. __ (2017). Eugene and I don’t necessarily agree on everything, so you shouldn’t necessarily attribute everything I say to Eugene. It is a sufficiently early work that you probably shouldn’t attribute this work to me either, because we are in the process of writing the paper as we speak. We encourage you to read the paper (available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2933867) for a more detailed analysis of these issues.

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and my glasses are going to remind me of your name and your spouse's name and your kid's names and maybe the last time we got together.

It's about the malleability of identity, about race; about gender; about disability.¹ It offers the ability to have a communication with someone, to introduce yourself to someone; to go into an interview without that person making a series of judgments about you based on the way you look or the way you talk because they don't know whether you're male or female, whether you're white or black, whether or not you can walk.

And, inevitably, it's also about sex. As always is the case for new technologies, one of the early things that drives adoption of a new technology is sex. VR is going to be no different. One of the things that every VR company is doing and no one wants to talk about doing is so-called haptic technology. Haptic is physical feedback technology. If you play video games with controllers, you have haptic controllers that will rattle or shake if you had to drive over bumps in the road. We are going to see a bunch of physical feedback mechanism built into our VR. In part for sexual reasons, in part for a bunch of other reasons, too.

I think existing VR is exciting, it's interesting, we can learn a bunch of lessons from it. But the stuff that's coming is more interesting in a legal sense, primarily because it's going to involve interacting with other people in the VR system in ways that you haven't previously interacted.

There are a bunch of legal issues presented by VR and AR. Some of these things are legal questions that will be fun and interesting, but they map to real-world issues. For instance, you've heard this morning from Molly Van Houweling, the fact that Pokémon Go causes trespass.² I might chase a Pokémon into the Holocaust Museum,³ or into someone's private property,⁴ or into the Brisbane police station,⁵ or off a cliff.⁶ All of those things have happened.

¹ See Mary Anne Franks, *The Desert of the Unreal: Inequality in Virtual and Augmented Reality*, 51 UC DAVIS L. REV. (forthcoming Dec. 2017).

² Molly Van Houweling, *Tempting Trespass or Suggesting Sociability? Augmented Reality and the Right to Include*, 51 UC DAVIS L. REV. (forthcoming Dec. 2017).

³ Andrea Peterson, *Holocaust Museum to Visitors: Please Stop Catching Pokémon Here*, WASH. POST (July 12, 2016), https://www.washingtonpost.com/news/the-switch/wp/2016/07/12/holocaust-museum-to-visitors-please-stop-catching-pokemon-here/?utm_term=.db6ea6d47b8c.

⁴ Veronica Rocha, *2 California Men Fall off Edge of Ocean Bluff While Playing 'Pokemon Go'*, L.A. TIMES (July 14, 2016, 3:45 PM), <http://www.latimes.com/local/lanow/la-me-ln-pokemon-go-players-stabbed-fall-off-cliff-20160714-snap-story.html>.

Pokémon, therefore, might contribute to or induce trespass. Putting a Pokémon in somebody's private property might be contributory trespass. Maybe it is itself trespass. That is a somewhat more interesting conceptual question: can placing a virtual item in your physical space constitute trespass?⁷

We will have to deal with these property law issues. But they're not fundamentally new and different trespass or nuisance issues. Similarly, AR, like texting, is distracting. If I'm looking at something that isn't there while I'm driving or walking down the road, I'm going to drive into somebody, I'm going to kill myself. At some point, people will die using AR. At some point, people will die using VR, either because they have a headset on and trip over their cat or because they have a headset on while playing a zombie survival game and have a heart attack because the game is too realistic. To me, these aren't the most interesting legal issues. They are legal issues that fit into an existing tort framework, and they take that existing tort framework or criminal law framework and they apply it to new technologies. That doesn't mean they're not interesting, but they're not primarily what I want to talk about today.

I think some of the most fundamental challenges coming from virtual reality come from the fact that VR blurs the line between the virtual and the real. It blurs the line between information and the physical; between speech and conduct. VR is visceral. It feels real in a way that's hard to understand unless you've experienced it. There's a VR experiment program where you stand on a floor or wide-open space place. You put on the helmet and inside the helmet, you see a narrow beam over what appears to be a pit. About one person in three just freaks out at that point. They're not standing on the beam. The mere fact that I see that pit actually causes real feelings of vertigo. And they say: "Get this thing off me I don't want to deal with it."

Then they ask you if you want to walk out on the beam. You walk out on the beam and they say: "Step off it into the void." About another third of people say, "You know, no. My body is telling me, do

⁵ Hayley Tsukayama, *Pokemon Go's Unexpected Side Effect: Injuries*, WASH. POST (July 10, 2016), https://www.washingtonpost.com/news/the-switch/wp/2016/07/08/pokemon-gos-unexpected-side-effect-injuries/?utm_term=.07fbb65d3d94.

⁶ Ben Guarino, *Australian Cops to Pokemon Fans: Do Not Come Looking for Pikachu in Our Police Station*, WASH. POST (July 7, 2016), https://www.washingtonpost.com/news/morning-mix/wp/2016/07/07/australian-cops-to-pokemon-fans-do-not-come-looking-for-pikachu-in-our-police-station/?utm_term=.afe7c4b98df4.

⁷ See Donald J. Kochan, *Playing with Real Property Inside Augmented Reality: Pokémon Go, Trespass, and Law's Limitations*, 38 WHITTIER L. REV. (forthcoming 2017).

not fall into the void. I'm not going to do it. I know intellectually that it is not a void — that it's just another step here — but I still don't want to do it.”

Then about another third of people are willing to do it. I was one of those people. Here is perhaps the most interesting fact about this experiment. Those of us who have overcome this know, intellectually, that “I am only taking a step forward. It is not a void.” Nonetheless, the people who run the VR lab have learned to try to catch us because we all still fall forward. If you take the step into the void, even though you're not actually physically going down, everything in your brain is telling you that you were falling forward. Your body actually physically starts to fall forward.

That's because what is real to us is a response to our senses. What we experience as real is what we see, what we feel; what the environment around us signals to us.

There are other examples. Some of you may be familiar with the Milgram shock experiment, the classic psychology experiment⁸ in which Milgram recruited undergraduate students and then told them that they are administering electric shocks to remote people in other rooms and you can hear the screams of the people. We learned various disturbing things about this. One is that people will do it, even if they think they're actually causing real harm. Second is that they react in a way that really bothers them. Their emotional reactions are significant.

They repeated the Milgram shock experiments in virtual reality,⁹ where you are theoretically shocking a virtual person who you know is not in fact real. It turns out that people's psychological and physiological responses to virtually shocking non-existent people map to the way they actually behaved when they thought they were shocking real people.¹⁰ They were still willing to do it, but it caused the same psychological and physiological trauma to them even though they knew, to a certainty, the people they were supposedly shocking were not real.

The third example involves the gender and race malleability issue. There are nice studies that show that putting yourself in the avatar of someone who is a different race or gender than you, recognizing that, looking in a mirror seeing yourself as someone you are not and then

⁸ See generally Stanley Milgram, *Behavioral Study of Obedience*, 67 J. ABNORMAL & SOC. PSYCHOL. 371 (1963).

⁹ See Mel Slater et al., *A Virtual Reprise of the Stanley Milgram Obedience Experiments*, PLoS ONE, Dec. 2006, at 1, <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0000039&type=printable>.

¹⁰ *Id.*

interacting with people for even a few minutes has significant effects on empathy¹¹ and on the way in which you interact with other people. You are more likely to show empathy for people who are not like you if you have spent even a few minutes, and even in a virtual world, acting as though you were such a person. This also happens to be true with interactions with virtual animals, which affects empathy for the environment.¹² We don't know how long term those belief changes are, how much it affects you three years down the line, but we know that it actually changes your behavior because it changes a bit of the way you think about yourself.

Similarly, research suggests that people respond physiologically to an attack in virtual reality as if it were real. The elevated heart rate, the fight or flight response, the sweat, the heightened perception, triggers in virtual reality if someone, a zombie or another person, is attacking you. This response occurs while you're wearing the helmet, even if you're in a game, and notably the effect is not lessened even if the avatar you are using is not of your gender. Even if there is something that is a cue to you that says this isn't me, this is some projection, you still feel it.

The upshot of all of this is that people know intellectually that VR isn't real, but our bodies behave as if it is.

One caveat: this could be a transitional phenomenon. When movies were first created, there's a fabulous example: somebody took a film of a train coming towards the camera and when they first showed the film and the train came towards the audience on the screen, people panicked, they freaked out, because here's a train coming towards me and my body's telling me, "Oh my God it's going to hit me."

VR might turn out to be the same thing. It might turn out that we can quite quickly separate our experience of the real from the virtual once we have some experience with it. We don't know the answer to that question. I think it's going to be harder than that precisely because VR is designed to be immersive. It's designed to actually remove the cues to tell you that you are not in the real world. And it's going to be designed over time to do that better and better. The way VR will evolve will be precisely to signal to you that you are in this virtual world, not in the real world.

¹¹ See Tabitha C. Pecka et al., *Putting Yourself in the Skin of a Black Avatar Reduces Implicit Racial Bias*, 22 CONSCIOUSNESS & COGNITION 779, 784-85 (2013).

¹² See Jessica Leigh Hester, *What If Virtual Reality Can Make Us Better Citizens?*, CITY LAB (Oct. 4, 2016), <https://www.citylab.com/life/2016/10/virtual-reality-empathy-natural-world/502694>.

So, what does that mean for law? Well, the good news is that at the end of the day you're still in a virtual world. Lots of the bad things people can do to each other in the physical world won't happen in virtual reality. You will not be murdered in virtual reality. Or, if you are murdered in virtual reality, you will not die in real life. Physical remoteness — the fact that the person you are interacting with is in Bangladesh — may make bad acts both harder to enforce (where do I find this person in Bangladesh?) and also much less worrisome. We might actually find many types of conduct less troubling in the virtual than the real world.

I think this is going to be the reaction of the law, at least at first, for a wide array of things. Let's take an example: disturbing the peace.

Disturbing the peace is a crime in the physical world. So, let's say someone is screaming repeatedly in a public place in virtual reality. It's not part of a game, it is a place where people congregate for economic reasons — the virtual equivalent of a shopping mall or a business. You are minding your own business and here this person pops up and is screaming. That screaming is interfering with your ability to live your life, so you call the police.

Imagine this conversation:

"Officer, there is a guy screaming and bothering my kids and me."

"What's the street address?"

"Well, it's not on the street, it's a virtual reality world."

"What?"

"Well, we are playing a virtual game in a virtual park and this guy is bothering us."

"Well, but where are you, really?"

"I'm sitting in my bedroom, but that's not what's important. I'm wearing my virtual headset and it feels to me like I'm playing with my kids in the park, my kids are with my ex across the country but we're getting together and playing virtually, and this idiot is ruining it for us."

"And, where is here?"

"Well, I clicked on his avatar and it tells me he is hooked up from Dhaka, you know in Bangladesh. But it feels like he's right here."

At this point: dial tone. Police are not going to care.

Police are likely to feel the same way about virtual indecent exposure. Imagine you call the police because somebody has exposed themselves. "So," says the officer, "you're calling the police because you're voluntarily wearing a special headset and in that headset, you're looking at an image of an avatar that appears to not be wearing virtual clothes." Click, dial tone.

None of this should be taken to suggest that you can't be harmed remotely. You clearly can be harmed remotely in ways that the law currently recognizes. Defamation from three thousand miles away is still defamation. Copyright infringement from three thousand miles away is still copyright infringement.

And for some types of speech-related torts we do in fact create liability without any physical interaction. Some of those things will have interesting analogs in the real world. Copyright and trademark owners will try to enforce their rights in the virtual world just as they do in the real world.

The right of publicity is an interesting thing. One, because I think what we're going to see is not just the kind of challenges which we would expect to see against commercial uses, but you are going to see a whole bunch of circumstances in which if I can choose to be anybody I want to be in my virtual avatars, I'm going to choose to be a celebrity. A company can't actually make Taylor Swift or Lara Croft avatar images and sell them. But suppose I make my own. I decided I wanted to look like Lara Croft, and so the question of whether that's a violation of the right of publicity is an interesting question. It is also an interesting question because I'm likely to identify with my avatar, at least if that avatar is persistent, in a way that's far greater than the way you would identify with even persistent avatars in other contexts, like existing video games or online screen names. You will embody this avatar — this person — in a way that is more visceral, that feels more real to you. That means your connection to it is likely to grow.

Now, we have connections of that persistent sort occasionally in the real world. Samuel Clemens probably identified with Mark Twain in significant respects. But they have been relatively rare. They are about to be a lot more common and that's going to present some legal issues.

That said, as a general matter, the law treats information — data, pictures, name calling — as much less dangerous than face to face contact. We see this distinction in existing law in lots of ways. Indecent exposure in person is a crime. If I took my clothes off right now, I would be arrested. But on a screen, it's protected speech. If you send an email to someone that has an image of a naked person in it, it may be a real dumb thing to do, but it's not an illegal thing to do.

That may be because we actually fear physical presence in ways that we don't traditionally fear virtual presence. We fear consequences — that indecent exposure might lead to sexual assault or something of that nature, which is more possible in the physical world than in the virtual world.

But it might also be because of this visceral reaction. There is something about having a person take their clothes off right in front of you that feels very different than seeing a picture of someone somewhere on the internet not wearing any clothes.

Similarly, I think the law of intentional infliction of emotional distress draws this kind of distinction between the physical and the nominal, speech related. It says even if a thing that actually hurts me is emotional, is psychic, we want to tie it to some sort of physical contact. In the absence of that physical touching, we will not, in most states, allow liability unless the conduct is truly outrageous. We just think in the law that words and images sent from a distance don't have the same effect as physical interaction. It's based on the well-known legal maximum that "sticks and stones can break my bones but words can never hurt me."

But words and data sometimes *can* hurt me. Sometimes they can actually quite physically hurt me in ways that I think are going to blur this speech versus conduct, this physical versus virtual data line. So, if I trigger epilepsy in someone I know has epilepsy by deliberately using strobe lighting and interacting with them in VR, I've injured them remotely. The fact that I wasn't in the room doesn't mean I haven't actually caused them physical harm by doing something that involves the sending of information or data to them.

What if I hack a person's VR headset to change its location algorithm, and the result is that they walk into the wall or fall down the stairs? Then I have physically injured them, possibly even killed them, by sending data, by sending information in ways that have real-world physical consequences.

The development of haptic technology is actually going to substantially increase that potential for virtual interactions to have real physical consequences. So, we're going to want to be able to play a video game in which we actually feel the response. If I'm in a sword fighting video game and somebody hits me with a sword, I feel it — I get a small electric shock, maybe it just kind of jolts my arm, and I respond.

We are going to want it not just for games. We are going to want it for virtual handshakes. Let's say I want to have a real interview, have a real business interaction with someone, that feels as real as possible. One of the ways to make it feel more real is that we can actually touch each other. We can shake hands and we will feel that we are shaking hands. That affects and drives the perception because it makes us understand it.

And, of course, there is sex. People will want to have sexual relationships virtually, and haptics are going to make that possible and more realistic.

The presence of haptics blurs the real versus virtual line even further. If I get a physical shock when someone hits me with a sword or a different physical sensation in virtual sex, triggering those haptic responses without permission is more physical and therefore feels more real than just sending a message or communicating that information.

Courts are likely to see the harm more easily when there is a physical touching, even a remote one. Say you hacked somebody's VR system and made them fall down the stairs. If you took control of someone's haptic system and actually gave them an electric shock that you were not authorized to do, those are things that we understand to be physical.

But maybe we ought to be worried about conduct even when it doesn't actually create physical, but only psychic, harm. You heard this morning about the Belamire example of virtual groping.¹³ And when you take that and you combine it with the literature that I talked about earlier, it suggests that the things that happen in VR feel real, that people react to it physiologically as well as psychologically, and that they identify with their avatar. That's a problem. It may or may not be as upsetting as being physically groped, but it's surely more upsetting than receiving a lewd tweet or email expressing a desire to grope you. All of those things are really upsetting, but it's a lot more upsetting in virtual reality than on the internet.

Maybe the law will want to treat things like virtual groping more seriously. The more people that are invested in VR, the more we believe it is real. The more we react to it as if it is real, the more seriously the law probably ought to take it. But I think at least for the foreseeable future, and for most of the harms I've talked about, courts aren't going to take it seriously. This is in part because VR today is primarily used for gaming and courts tend to treat gaming as not important. It's only in 2008 that gaming was recognized as getting the protection of the First Amendment, for instance.¹⁴

In gaming there is also the lack of physical presence, the fact that in some kind of technical sense only information is being transmitted.

¹³ See Sara Ashley O'Brien, *She's Been Sexually Assaulted 3 Times – Once in Virtual Reality*, CNNMONEY (Oct. 24, 2016, 11:01 AM), <http://money.cnn.com/2016/10/24/technology/virtual-reality-sexual-assault/index.html>.

¹⁴ See *Brown v. Entm't Merchs. Ass'n*, 564 U.S. 786, 790 (2011) (holding that "video games qualify for First Amendment protection").

Another contributing factor may be the lack of jurisdiction; the fact that we can't find the defendant at all, and if you find them they might be a long way away. And for a while, there will also be a lack of widespread judicial experience with VR. I think these factors combined will mean that the courts are going to say: "It's not real, it's not important, it's not significant."

I actually had a debate relatively recently with a federal judge who is probably the single most respected federal judge in intellectual property ("IP") issues. He is a really smart judge who swore up and down that it wasn't possible to defame an avatar because avatars aren't real. He believed that you can't defame an in-game character because it's just a game, it's not a real thing. I think that's nonsense under existing law. For example, you can clearly defame a pseudonym now. But I couldn't dislodge him from his position because he put avatars — he put games — in a box of kid's stuff: things we don't actually need to care about in the law. I think that's a mistake, but I think it is a mistake that courts are likely to make for the foreseeable future. We will slowly start to change as we encounter circumstances where we actually do understand the harm because it has good real-world analogs. But right now, I think the law's answer to virtual reality is largely going to be: "Eh, we don't see it as a problem."

Furthermore, all of the potential law of virtual reality is going to take place in a context in which everything that happens, happens on a privately-owned corporate server. There is no public VR system; there are a bunch of currently incompatible private VR systems.¹⁵ That means everything that happens will happen subject to terms of use which you, by putting on the helmet, have agreed to. And I guarantee you those terms of use will disclaim the company's liability for virtually anything.

Now, that itself seems to be a problem that the law needs to address. The fact that by walking into an environment I am deemed bound to contracts written by other people that I can't see, and couldn't change if I could see them, is a major failing of modern contract law. But it is modern contract law for better or for worse. And it is true that we limit the ability to disclaim liability in some circumstances. Where we actually perceive in the courts real physical injury, we might say your ability to disclaim liability for that physical injury is limited as we do with physical injuries in the real world.¹⁶ But the enforcement of terms

¹⁵ The primary VR platforms at this writing are Facebook's Oculus Rift, HTE's Vive, Sony's PlayStation VR, and Microsoft's HoloLens.

¹⁶ See Mark Geistfeld, *The Political Economy of Neocontractual Proposals for Products Liability Reform*, 72 TEX. L. REV. 803, 816 n.40 (1994).

of use takes the deepest pocket, the easiest defendant to find, off the table for most torts. And it effectively eliminates indirect liability claims, at least those indirect liability claims brought not by copyright owners, but by the VR users themselves who “signed” the contract when they put on the VR headset.

The combination of a reluctance of courts to take this seriously and a legal system that’s basically allowed people to waive themselves out of liability means that the real law of virtual reality for the foreseeable future might not actually involve much law.

On the other hand, the fact that VR occurs in both privately-created VR hardware as well as software systems means that things that can and can’t happen in the virtual world are a function of design and can potentially be altered, not only by the VR company itself but by user choice.

Maybe we can solve the problem by having the hardware and software companies take up some of the slack. They could solve these problems in the design of their systems. Alteration by VR companies and users is especially likely if the law is unlikely to intervene. VR companies or users could intervene if they see something that they think might be a problem and know that the law’s not going to do something about it in the short term. Mary Anne Franks talked about the QuiVr example and their response to the Belamire incident.¹⁷ They could do it by creating norms. For example, X and Y are permissible in this virtual reality environment, but Z is not. Or, certain actions are permissible here, but not there. VR companies can create those norms and best practices. They could even create in-system dispute resolution processes. So, in that way, my response to harm that I’ve experienced might actually happen within the system. Alternatively, there is the VR death penalty: getting kicked off the system in which you’ve used your avatar for a long time. That could be quite effective as a deterrent. And quite possibly easier to use than calling the police and saying this person is disturbing the peace.

Better still, many of these problems can be affected by self-help or software programming the user can control even if the platform is agnostic about it. So, if I’m bothered by you yelling in a virtual public place disturbing my ability to get work done, I’m likely going to be able to mute you. Click a button, wave a finger in a certain way, and now I can’t hear you anymore. Maybe I can make you disappear from my experienced reality altogether. Wipe you away and suddenly you’re

¹⁷ See Franks, *supra* note 1 (describing the creation of a one-foot personal bubble feature as one way to combat sexual harassment in the virtual world).

not there anymore. I don't want to be affected by indecent exposure? Well, we can program VR systems so that I don't see anyone nude. You might think you're appearing to me nude. But I have virtually dressed you. Problem solved, right?

Maybe.

Systems may have an incentive to allow that sort of thing for conduct that looks like it will be socially problematic. Even if they don't, I will likely be able to download a mod that will do it for me.

We might actually be able to solve virtual groping in the same way. Creating a personal bubble that can prevent anybody from touching me until I consent to open the bubble, until we enter into some sort of a handshake agreement — a computer handshake agreement that says, “Yes, we will enter into a physical interaction.” I might be able to prevent anyone from touching me. I might be able to flick my finger and send the offender far, far away. So, I can turn on the ability to come near me, to touch me — certainly to trigger haptics — only in certain circumstances: in voluntary interactions, when I'm playing a game, when I want to do it, when it's beneficial.

I think this is, at best, only a partial solution. For some truly harmful conduct, banning you after you take this bad act towards me doesn't sound sufficient. You don't get to put the burden on me to ban you only after you grope me once. So, we might want to set some defaults that limit behavior by strangers. The law might do so. If it doesn't, the systems might.

Nonetheless, the ability individual users have to prevent unwanted experiences by controlling the terms of consent actually seems to be a good partial solution to the problems of law and VR. Not only that, it also seems to me like a big step forward from the real world. I'd love to have a personal bubble space to prevent unwanted touching in the real world. I would really love to have the ability to mute some people by swiping my fingers. So this sounds great.

Perhaps the most significant philosophical thing for law about the virtual reality experience is that unlike systemic limitations on what can happen, these self-help systems change only my lived experience and not yours. As far as you know, you're naked, in front of me. It's just that I see you as clothed.

Now we might be okay with that difference. We might say: “Hey, you know what, this is a libertarian ideal, it's live and let live, we have a freedom of experience in which if I want to see the world in a certain way and make you all look like Donald Trump, more power to me. If you want to not look like Donald Trump, more power to you,

everybody's happy." We might even think freedom of experience should be a baseline legal norm of VR.

But, maybe not. The real fundamental legal question is whether the ability to prevent my perception of bad things happening to me solves the legal problem. And that turns out to be a hard legal question that leads to some pretty fundamental issues around the nature of harm. If the harm is my experience, my physical and physiological reaction, my psychological injury when you've done a bad thing to me or exposed yourself to me, we can solve that problem by giving me control over how you appear and how you can interact with my avatar. But if we think the problem is the bad behavior in itself, whether or not it affects a victim, it doesn't matter that the victim can't see themselves being groped. The tendency of the law to punish attempt even when the attempt could not possibly have succeeded suggests that we think that conduct is problematic even when it has no real-world consequences.

There may also be harms that happen because of the presence of third parties. Consider defamation. If you say bad things about me to third parties, I'm injured in a way that I can't prevent merely by not hearing them. If you dress up as me, you appear to be me and do bad things for which I am blamed, that too is a harm that I can't just wish away.

But I think there are reasons we might still be worried even about second-party perception. If I can superimpose clothes over your naked avatar, you can presumably do the opposite. You can view me as naked even when I'm subjectively wearing clothes or make me appear to you as Donald Trump. Now, I think that should be defamation *per se*, but that's another matter.

Well that's kind of creepy. It's creepy in VR. It's even more creepy in AR if the person who's wearing Google Glass and actually standing in front of you in the real world can find your most embarrassing Facebook picture. And look at you as if you are your most embarrassing Facebook picture. Or they can superimpose somebody else's naked body on you. People do this sort of thing all the time in internet porn, for instance.

Similarly, the fact that I have a personal bubble in VR in which you can't touch me from my perspective doesn't mean that you aren't offensively touching me from your perspective. And the question is: should the law care about that?

Creepiness isn't illegal of course. People do creepy things in their own fantasies and we don't punish them. The interesting question, though, is why we don't. Perhaps we don't punish them because we can't — we don't know about them — or because we can't consistent

with the notion of personal autonomy, if we have to get into their head to do it. Or perhaps it's because we think there is something different about your experience and my experience and we care only about the victim's experience. I think that there are some reasons to think that we might not care only about the victim's experience. We might worry that the subjective and unshared experience of the perpetrator has corrosive effects on the real world.

If someone can virtually undress you in VR while interacting with you, or in the physical world while interacting with an AR, they may treat you differently. Certainly, if they can virtually assault you, even if you don't experience it because you've got a personal space bubble, that may affect the way that they behave with others. It may affect the way they behave towards you.

It's not clear that the law can or should regulate that behavior. But it is awfully clear that society should worry about the effects of that behavior. And I think this question, to which I don't have a great answer, in turn, requires us to think seriously about some distinctions we take for granted in the real world of law. The distinction between harm caused by presence and harm caused by remoteness and the distinction between harm caused by speech and harm caused by conduct require us to interrogate what it is that we think is real and what's merely perceived.

We take for granted that we understand the difference. One of the interesting things that virtual reality does is make it clear what we don't. That our reality is, in fact, our perception of the world around us, and people's perception of the world around them may well be very different than our perception. I have no other way to explain the outcome of November 8 than the fact that we all already live in something that we pretend is a shared reality, but in fact is a very different reality.

It may turn out that the reason we ban indecent exposure — the reason we care — is not just about the physical presence, the possibility of a physical threat, but about perception and psychic harm. If so, maybe that causes us to rethink legal harm not just in virtual reality, but in real reality.

It may turn out that we care about the perpetrator's subjective perception of reality, and that we're troubled by the way the perpetrator views things, even if it causes no objectively manifested harm to the victim. That too suggests a much broader notion of what we would punish if only we knew about it, if only we could. And that has implications not just for the virtual world, but also for the way we think about law and harm in the real world.