

PERSONAL TECH

If You Like Immersion, You'll Love This Reality

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Farhad Manjoo

STATE OF THE ART

The news that Facebook paid \$2 billion for a virtual reality start-up, Oculus VR, might strike you as a bit zany. Like flying cars and robotic maids, the idea of donning a pair of computerized glasses and slipping into a digital world feels like a snapshot from yesterday's future.

Is something so self-consciously geeky really worth billions of dollars? What would a nontechie nongamer do with virtual reality?

The answer: pretty much everything.

"I don't worry anymore about whether it will be accepted by the mainstream — that will happen," said Jeremy Bailenson, a virtual reality researcher who directs Stanford University's [Virtual Human Interaction Lab](#). Like many in his field, Dr. Bailenson argues that virtual reality technology is advancing so quickly that it is certain to infuse just about every corner of our lives. After trying out the technology in Dr. Bailenson's lab this week, I believe he's more right than wrong. Virtual reality is coming, and you're going to jump into it.

That's because virtual reality is the natural extension of every major technology we use today — of movies, TV, videoconferencing, the smartphone and the web. It is the ultra-immersive version of all these things, and we'll use it exactly the same ways

— to communicate, to learn, and to entertain ourselves and escape. Dr. Bailenson says that it will even alter how society deals with such weighty issues as [gender parity](#) and [environmental destruction](#).

The only question is when.

Dr. Bailenson calls his lab's advanced VR rig "one of the most intense, immersive virtual reality experiences on the planet." In addition to running test subjects through the lab's technology to see how people respond to virtual environments, he regularly hosts business leaders looking to experience the future of virtual reality. Just a few weeks before Facebook announced the Oculus acquisition, Mark Zuckerberg, a co-founder and the chief executive of Facebook, dropped by for a visit.

This week, in an hour-and-a-half session, Dr. Bailenson offered a series of simulations similar to the ones Mr. Zuckerberg experienced. Sometimes his guidance was physical; when I "fell" into a virtual pit as I scampered across a virtual plank, my real-life body crumpled, and Dr.



A monitor shows the virtual reality being experienced by Jeremy Bailenson of Stanford's Virtual Human Interaction Lab in Palo Alto, Calif. Thor Swift for The New York Times

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Bailenson had to catch me. By the end of simulation, I was a little dazed, and my neck hurt from carrying the lab's five-pound, \$30,000 goggles, which offer a far more realistic simulation than can be achieved with smaller, cheaper headsets, like Oculus's Rift.

But I was hooked, too. I had experienced how an immersive virtual reality simulator can play strange tricks on one's body, mind and mood.

And I could see how Mr. Zuckerberg might have come away from the lab optimistic about the future of this technology.

As Dr. Bailenson [pointed out](#) in "Infinite Reality," a book he co-wrote about the future of VR, humans are an escapist lot. From books to movies to video games to iPads, whenever technology has presented us with ways to jettison our worries and slip into worlds of our own making, we've jumped at the chance. If the tech is good enough, virtual reality will be no different.

For years, the most convincing criticism of virtual reality was that the technology just wouldn't be good enough. That's still the main criticism. Virtual reality devices work by sending a computer-generated image to each of your eyes in response to your movements. The simulator's fidelity depends on how accurately it can track your movements, and how quickly it can adjust the image to match the motion. If the technology is just a little off, the simulation fails.

"If you turn your head and look over there, you'll notice a slight discrepancy, and your brain will feel it," said Tadhg Kelly, a game designer who writes the blog [What Games Are](#), and who has been [skeptical of VR's ability to go mainstream](#). "I wonder if that feeling of dislocation will ever quite go away, and if you'll ever be able to get immersed in the scene."

That gets to the Achilles' heel of VR. If you're aware of the simulation, virtual reality will feel gimmicky, and, from [Smell-O-Vision](#) to 3-D TV to the "[uncanny valley](#)" of animated faces, the history of media is littered with failed, gimmicky efforts to create better simulations of the real world.



"The biggest question we had was, 'Was this the right time?' " said Chris Dixon, an investor at the venture capital firm Andreessen Horowitz, which led a \$75 million investment in Oculus VR in December. "But we found that we're just at the right time for all the stuff to work."

Mr. Dixon pointed out that the rise of the smartphone industry had helped push down the cost of powerful displays and tracking components required for new VR headsets, putting virtual reality on the trajectory of mobile electronics and computers, which became cheaper and more mainstream as the technology improved.

He predicted that VR would be useful even before it was perfect, and said that gaming would not necessarily be its first breakout hit. "It's such a compelling experience that some games — especially shooting games — will be too real," Mr. Dixon said. "It would be as if you're actually getting shot at."

I know what he means. When I crashed into objects at Stanford's virtual lab, the impending impact felt so real that I often rotated my body to blunt the force. The sensation wasn't exactly enjoyable.

Rather than exciting physical feats, I was more thrilled by the simulator's power to push me to forge emotional connections with other virtual characters. In one simulation, I walked into a room in which there were a dozen or so people, all seated in front of me, staring at my eyes. The people didn't look realistic; they looked like video game characters, splotches of polygons.

Yet when the researchers asked me to walk toward the group, bend my

head down and touch one of the people nose to nose, I found it incredibly difficult. In a way that I've never experienced in a video game, I felt as if I were dealing with real people — and violating their personal space.

It's this ability to let us feel a sense of human connection that boosters say will make virtual reality a powerful communications platform. Today, companies spend billions on travel and videoconferencing, because even though we can all get our work done remotely, face-to-face meetings are powerful.

Yet researchers have shown that virtual meetings can be [even better than real-life encounters](#), because our avatars can be programmed to act perfectly manipulatively, in ways that we can't. For instance, in VR encounters, everyone can make eye contact with everyone else, suggesting a level of attentiveness that might be lacking in reality.

Another potential use is pure escapism. History shows that we've never shied away from such immersive experiences when they work. Since their invention, movies have offered a compelling, immersive world. These days, we go outside wearing big headphones to transport us through music. And we can't stop staring at our phones.

"If you use Oculus to look at a panoramic photo, it feels like you're there," Mr. Dixon said. "Who wouldn't want to do that after a long day of work — to change your mental state by escaping into a photo?"

He added, "In some ways, the biggest competitor to virtual reality might be a bottle of wine."

Email: farhad.manjoo@nytimes.com;

Twitter: [@fmanjoo](https://twitter.com/fmanjoo)

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