Telexploration, OnSight, and HoloLens "on" Mars

MICHAEL OMAN-REAGAN

With the announcement of the Microsoft HoloLens project, it’s become clear that NASA is working with Microsoft on developing this technology for use in “telexploration.” Jeff Norris, who works for NASA, tweeted today: “I have spent a long time not talking about holograms. Now I’m not going to shut up about them!”

At Visualized in February 2014, Jeff Norris gave a talk about telexploration, i.e. using human interaction with robots and computers to explore.

In the talk, he says that telexploration gives field scientists the ability to engage in more immersive exploration compared to sitting at a desk and looking at a computer screen to see data from probes and rovers. In a recent article in Wired magazine, reporter Jessi Hempel described NASA’s early role in using the technology:

“NASA has already gotten an early crack at it. As the mission operations innovation lead at the agency’s Jet Propulsion Laboratory, Jeff Norris is charged with rethinking how we explore space, with a focus on the interface between humans and technology. He met Kipman nearly five years ago when he was creating Kinect. In Project HoloLens, Norris saw the potential for technology to help space explorers collaborate more closely and to provide them a quality known as presence. (“People make better decisions when they feel like they’re in the environment,” he says.) Last March, Norris and several members of his team relocated from Southern California to Redmond for a few months to build a Mars simulation.”

Wired reports that NASA has signed on as a “launch partner.” NASA reports they are partnering with Microsoft to develop OnSight software which will connect scientists here on earth with the Curiosity Mars rover. Norris says they plan to be controlling rovers on Mars using this technology by July 2015.
The Wired reporter describes her own experience using the system:

“I slip on the headset and find myself on the parched, dusty surface of the Red Planet. Behind me, the Curiosity rover towers 7 feet tall, its cameras recording the terrain. The illusion is so real my legs begin to quiver, unsure what to make of the disparate information I'm sensing. Norris appears beside me in the Mars-scape, represented as a 3-D golden human-shaped blob. A dotted line extends from his eyes toward what he’s looking at. “Check that out,” he says, and I squat down to see a rock shard up close. Project HoloLens allows me to work on a desktop computer while in the demo, something you can’t do in the Rift’s virtual world. It also makes it possible for me to pin holographic flags on the virtual scenario, and someday this will be able to set in motion real-world actions. With an upward right-hand gesture, I bring up a series of controls. I choose the middle of three options, which drops a flag. When scientists do this, the command could theoretically be transmitted to the actual rover so that the task can be accomplished in real life, on Mars. The simulation is so effective that NASA plans to deploy it on a mission by this summer.”

I can’t help but wonder right away if telexploration of this quality, likely only to improve exponentially, will result in enormous changes here on Earth – but also in space. Will anyone go to an office again? But also, will anyone leave the earth and go into space? With high quality simulation and better robots telexploration may at some point become indistinguishable from “being there.” At that point will humans see a need to send their fragile bodies away from the earth into the dangerous, extreme environment of space?

In my research on Indonesian activists I found virtual activism and engagement in online social media was just as meaningful to activists as offline action. Much of my early work has focused on exploring this aspect of virtual spaces, in understanding how cyberspaces are as meaningful and as real for users as other physical spaces and places. Even so, I can’t help but consider the problem of “being there” when I think about telexploration. Although in Norris’s descriptions of the technology what excites him and the scientists is that it brings them closer to being there – for them the HoloLens is a step toward something more like being on Mars even though the technology is about infusing data and user interfaces with simulated qualities of worldness. Is it a stop gap between today and the time when those scientists can easily take a research trip to Mars? Or will it replace that desire to go, to stand there – or to go and stand anywhere?

There’s something useful about thinking of the HoloLens as an online space and a virtual world. Even though it is mapping data onto the physical/real world not recreating it – in a way, it is recreating/creating an imaginary, constructed world for the user. When considering online spaces, Boellstorff et al (2012) suggest looking for embodiment and worldness to determine if they are “virtual worlds.” Boellstorff et al define virtual worlds as places with a sense of worldliness, including objects and environments that you can traverse and interact with; places which are multi-user in nature, containing shared social environments with synchronous communication and interaction; places which are persistent, in that they continue to exist when users log off; and which allow participants to embody themselves, usually as avatars (2012:7).

I propose instead that the virtual worldliness of an online space can be better understood by looking at how that space is used rather than only at the structure of the software or user-interface. Instead of focusing on the architecture of the space, or the perceived physicality of that interface, or what it allows, I suggest refocusing the assessment to look at the social structures emerging in dialogue with that space (Oman-Reagan 2013). In this way, I argue that when used in certain ways, Facebook becomes a virtual world. The same could be said of the HoloLens which can augment reality, add to the physical world – or transport the user completely. But even if the user is transported to Mars through an immersive holographic environment, they may not be engaging in a place with the kinds of social and cultural features involved in other virtual geographies.

Klastrup has proposed using immersion, presence, and engagement to understand the worldliness of a place (2009). But what happens when the “real” world, this world, becomes a virtual world through
immersive augmented reality? How will this change us, in light of the ways other digital technologies, online spaces, and virtual worlds have changed us? How does this development change the possible future of human culture, the possible future for human exploration and settlement in space?

Carl Sagan wrote in *Pale Blue Dot* that we are a species of wanderers. He suggested that our imagination and our dreams about far away places may be selected for by evolution. Of course they may also be socially constructed. Here are Sagan’s words on the way we’re drawn to new worlds, which Erik Wernquist so brilliantly and inspiring edited together in his short film *WANDERERS*. For now, films like this are how most of us can suspend our disbelief, and imagine that we are there, in space – imagine what it must be like to walk on another world. Will technology like HoloLens bring us closer to walking on other worlds? Like Jules Verne books and Star Trek films inspired scientists and astronauts, will holographic augmentation inspire the next generation of wanderers?

“For all its material advantages, the sedentary life has left us edgy, unfulfilled. Even after 400 generations in villages and cities, we haven’t forgotten. The open road still softly calls, like a nearly forgotten song of childhood. We invest far-off places with a certain romance. This appeal, I suspect, has been meticulously crafted by natural selection as an essential element in our survival. Long summers, mild winters, rich harvests, plentiful game—none of them lasts forever. It is beyond our powers to predict the future. Catastrophic events have a way of sneaking up on us, of catching us unaware. Your own life, or your band’s, or even your species’ might be owed to a restless few—drawn, by a craving they can hardly articulate or understand, to undiscovered lands and new worlds.

Herman Melville, in Moby Dick, spoke for wanderers in all epochs and meridians: “I am tormented with an everlasting itch for things remote. I love to sail forbidden seas…”

Maybe it’s a little early. Maybe the time is not quite yet. But those other worlds— promising untold opportunities—beckon.

Silently, they orbit the Sun, waiting.”

REFERENCES

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Klastrup, Lisbeth

Oman-Reagan, Michael Paul

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