ARTICLE
Configuring the Other: Sensing War Through Immersive Simulation

Lucy Suchman
Lancaster University
l.suchman@lancaster.ac.uk

Abstract

This paper draws on archival materials to read two demonstrations of FlatWorld, an immersive military training simulation developed between 2001 and 2007 at the University of Southern California’s Institute for Creative Technologies. The first demonstration is a video recording of a guided tour of the system, staged by its designers in 2005. The second is a documentary created by the US Public Broadcasting Service as part of their “embedded” media coverage of the system while it was installed at California’s Camp Pendleton in 2007. I critically attend to the imaginaries that are realized in the simulation’s figurations of places and (raced, gendered) bodies, as well as its storylines. This is part of a wider project of understanding how distinctions between the real and the virtual are effectively elided in technoscientific military discourses, in the interest of recognizing real/virtual entanglements while also reclaiming the differences that matter.
Modernity produces its other…as a way of at once producing and privileging itself. This is not to say that other cultures are the supine creations of the modern, but it is to acknowledge the extraordinary power and performative force of colonial modernity. Its constructions of other cultures—not only the way these are understood in an immediate, improvisational sense, but also the way in which more or less enduring codifications of them are produced—shape its own dispositions and deployments.


It is Monday, 2 April 2012, and I am sitting at a Peet’s coffee shop in Marina del Rey, California talking to Jarrell Pair, former lead designer for FlatWorld (2001–2007), a flagship project of the University of Southern California’s Institute for Creative Technologies (ICT). In his book *Virtuous War* (2009), political theorist and United States military chronicler James der Derian identifies the ICT’s opening in 1999 as a founding moment in the emergence of what he names the military-industrial-media-entertainment network. Committed to strengthening the synergies of the entertainment and defense industries, the US Army allocated $45 million for five years to USC to create a research center for advanced simulation development. The US Department of Defense’s rationale for investing in new simulation technologies at the beginning of the twenty-first century is set out by retired Air Force Colonel Jack Thorpe, hired by the ICT at its 1999 founding. In an early concept paper, Thorpe puts forward the idea of “exploiting emerging technologies from theatrical set design [to] improve the fabrication of mockups for planning and rehearsing military operations in close-quarter spaces” (2000, p. 1). Der Derian embraces the credibility of this idea when he proposes that “[b]y its very task and potential power to create totally immersive environments—where one can see, hear, perhaps even touch and emotionally interact with digitally created agents—the ICT is leading the way into a brave new world that threatens to breach the last fire walls between reality and virtuality” (2009, p. 167). Along with its endorsement of sensory presence as a ground truth for
knowledge-making (see Cohen Ibañez, 2016), der Derian affirms the potency of digital research and development. At the same time, he conceives the relation between the real and the virtual as a difference—a boundary—that is increasingly under threat.

My own exploration of the ICT’s landscapes proceeds differently. Instructed by feminist technoscience studies, I take the real and the virtual to be always already entangled. Rather than a progressive assault on the real, the turn to virtualization technologies rematerializes imaginaries of lived reality, with real, material consequences. I take seriously the imaginaries informing virtual reality projects, while maintaining a critical skepticism regarding the extent to which the technologies actually realize their imagined promises. Both attitudes are crucial for articulating the performative agencies of the technosciences of the artificial, without reproducing their mystifications. This skepticism extends beyond the technologies, moreover, to the premise of rehearsal as a means of war’s rationalization and management. On the one hand, rehearsal is always a virtual exercise, informed by remembered pasts and realizing events in an imagined future. On the other hand, rehearsal is not simply preparatory but also performative, and training articulates the real in ways that have consequences. Configurations of real bodies and virtual realities open up sites of slippage and resistance, and it is in the irremediable gaps between rehearsals for war and the lived realities of embodied conflict that counter-stories emerge.

**FlatWorld’s absent presences**

As recounted by Timothy Lenoir and Henry Lowood (2005) in “Theaters of War: The Military-Entertainment Complex”:

At the opening ceremonies of the ICT, Richard Lindheim, the executive director, outlined several projects the institute would be pursuing. Among those he described was a construction of what he referred to as “the holodeck.” The idea, Lindheim explained, is to leverage new media technologies of virtual reality to link immersive
virtual environments with interactive synthetic agents…that are
elements of simulation- and game-based learning exercises. (p. 35)
As a first instantiation of the holodeck, a single room FlatWorld prototype
was installed in November 2001 in a warehouse space near the ICT in
Marina del Rey. Paramount Studios, with assistance from Herman
Zimmerman, production designer for *Star Trek: The Next Generation*
(Figure 1), created the installation’s physical walls and props.

Figure 1. FlatWorld Installation, 2001. Archive photo courtesy of Jarrell Pair, FlatWorld
project, ICT, demoimages/l.jpg

The designers’ goal was to create virtual environments that are
“indistinguishable from their real world counterparts” (Pair, Neumann,
Piepol, & Swartout, 2003, p.14).\(^3\) Citing the Universal Studio theme park’s
seamless integration of physical and virtual spaces, FlatWorld’s “mixed
reality” approach promised an improvement over earlier virtual reality
systems requiring head mounted displays tethered to cables, or immersing
the user in exclusively digital projections. Over the ensuing seven years,
FlatWorld developed as part of the US military’s re-orientation from force-
on-force to counterinsurgency training, in tandem with training exercises employing live actors and set in outdoor and purpose-built environments (see Magelssen, 2009; Rice, 2016; Stone, forthcoming). Large “digital flats” running real time computer graphics were augmented by physical props that acted as portals into the virtual world (physical doors open onto a virtual square), along with sensory effects cued to relevant virtual objects and ambient environments (floor speakers simulate the sound and vibration of explosions) (Figure 2). Culminating in the Infantry Immersion Trainer deployed at Camp Pendleton in 2007, the system was subsequently “disassembled to make way for new projects” (J. Pair, personal communication, 29 August 2012).

So what are the portals through which we, as feminist scholars of technoscience, might access simulation projects like FlatWorld, created within the military-entertainment complex? Cohen Ibañez’s (2016) critical consideration of the trope of “sensorial presence” in immersive simulation reminds us that the senses “cannot be divorced from the political, economic, historical, technological and linguistic realities that govern the sense we make of them” (p. 23). And as Lenoir and Lowood (2005)
observe, the relationship between military simulation and commercial entertainment has a long history. Since the early 1880s, when Major W.R. Livermore of the US Army Corps of Engineers imported gaming from the Prussian military for officer training, the relationship of gaming and training has become further entangled through the incorporation of digital media into commercial game design, Hollywood film production, and war fighting itself. Andrew Marshall, chief spokesperson for the Revolution in Military Affairs (a new world of network-centric warfare), set the challenge in 1977 at a workshop with game designers and defense analysts (Lenoir & Lowood, 2005, p. 5). Throughout the 1980s, the expense of “live” exercises and the expansion of computing made simulation increasingly attractive. By the 1990s, academically based computing research found new funding sources to develop high-end simulations for military training, and over the past twenty years researchers have increasingly turned to the game and film industries for advice on scripting and production effects. In 1992, STRICOM, the Army’s Simulation Training and Instrumentation Command, was established under the banner “All but War is Simulation” (Lenoir & Lowood, 2005, p. 22).

Back in the coffee shop down the road from the ICT in 2012, Jarrell Pair and I have spent the last hour discussing the life of the FlatWorld project over its seven year existence. Where is the project’s archive, I ask? Well, I suppose I have most of it, he replies, and then generously offers to make it available. Four months later he sends me three gigabytes of material, over 1,000 files tracing the FlatWorld project from its precursors to its last implementations. It is this fortuitous archive that comprises my current field site.

One video from the archive documents the FlatWorld system in 2005, in the form of a guided tour by its lead designer (see transcript in Appendix). The tour opens as a filmic event: we see the designer, J, his hand on the door leading into the FlatWorld simulation, addressing the camera with the query “Filming?” We then hear the canonical cinematic command “Action.” Before the door opens, we hear sounds that seem to come from somewhere else than the studio space in which J and the
cameraman are standing: a combination of Islamic calls to prayer and gunfire in the distance. J explains that this walkthrough is not “a story-based demo,” but rather demonstrates the system’s technical capacities, with the viewer invited to extrapolate its uses “in operational settings.” As we will see, however, the demo’s technical system is saturated with stories.

As the beginnings of an analysis, I focus on how J enacts his own position in relation to this environment, remaining outside of it even as he walks us through it. Considered as what John Law has named a method assemblage (2004, p. 14), J’s walk through the simulation makes some things present by making others absent, or at least peripheral. For me, the latter include the culturally and politically saturated figurations in which J is immersed. I imagine that J addresses us, the absent audience, not as academics but rather as those who might be impressed by the system’s capabilities and persuaded of its potential. His position as the designer is enacted in the agencies of the tablet through which he initiates commands to which the system reliably complies—our attention moves back and forth between his actions at the controls, and those effects to which he directs our gaze. We are invited to see that “there’s one contiguous world” surrounding the room in which we are standing, populated by unmanned vehicles, “bad guys,” “heroes” and children taunting us with virtual rocks that sonically “bounce” when they hit the floor. At the same time, we are interpellated back into the design world through J’s references to the operating mechanisms: digital flats and mobile displays allow us to pick out targets and adversaries; stress levels can be controlled through simple adjustments; figures are nicely life-sized and bad guys appear on command and are as easily dispatched with the press of the controller’s button. These elisions of the system equipment (devices, control interfaces) and the militarized subjects/objects that it renders (as trainees or threats) hold together in one material semiotic space the system’s connected claims to instrumental efficacy and verisimilitude.

My first viewing of this video left me disconcerted, a feeling that I linked to J’s indifference to the system’s specific figurations, even as he is
inescapably implicated in their militarist and Orientalizing effects (Ali, 2016; Gregory, 2004; Said, 1978). Philosopher anthropologist Helen Verran (2001) has suggested that, rather than something to be resolved through analysis, disconcertment can be a sign of a trouble with which we need to stay (see also Haraway, 2010). How is it that J maintains his surroundings as the world of research and design, at the same time that he is incorporated, bodily and professionally, into the military-entertainment complex? The question of what and whose realities are made present in the demonstration and how it separates us (designers, audience, trainees who share an actual world) and them (those Others encountered as simulated locals or “natives”) ties this demo to wider issues, including the military concept of “situational awareness” and the requirements of “positive identification” and “imminent threat” that underwrite the canons of legal killing (Suchman, 2015). I am thinking about the trope of situational awareness through related questions of intelligibility and identification, and more particularly through a frame inspired by Judith Butler’s analysis of recognition’s generative agencies. In *Bodies that Matter* (1993), Butler suggests that the body’s intelligibility includes its “constitutive outsides,” those unthinkable and unlivable bodies “that do not matter in the same way” (p. xi). “Bodies that do not matter in the same way” take on further resonance in the context of simulation, as another sense of bodies differently materialized. FlatWorld’s distinction between “us” who are actual, and “them” who are virtual plays as another layer of intelligibility and identification, which works in a complex dynamic with other readings of “us” and “them” that are so central to war (see Chandler, 2016). To name just three that are relevant here:

- Us who are real, versus them who are virtual
- Us who are Americans, versus them who are Other (generally Arab, more specifically Iraqi and Afghan)
- Us who are friends, versus them who are enemies

On first look, the first of these differences is self-evident—we watch the video demo along with the actual researcher, guiding us through virtual spaces and encounters. This is marked in part by the ease with which we
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distinguish J’s address of “us” as the audience from his engagement with various virtual avatars, as well as the moments when he breaks frame to address actual offstage others (the cameraman, technicians). At the same time, we begin to see how “our” bodies are transformed by being immersed in virtual environments, while “their” virtual bodies are also reiterative and generative of actual ones. That is the premise and promise of simulation. These simulations are infused with the second reading of “us” and “them,” through figures of us who are Americans, differentiated from them who are Other. And that difference leads us to the third, between friend and enemy.

Art in the service of realism: Some special effects

In exploring FlatWorld’s archival remains, my aim is to attend critically to the imaginaries that are realized in the simulation’s figurations of places and raced and gendered bodies, as well as in its storylines. My analysis takes as a central commitment the recommendation of media theorist W.J.T Mitchell in his book Cloning Terror (2011). He writes: “It is never enough simply to point out the error in a metaphor, or the lack of reality in an image. It is equally important to trace the process by which the metaphorical becomes literal, and the image becomes actual...We need a method that recognizes and embraces both the unreality of images and their operational reality” (p. xviii, emphasis in original). I approach the differences outlined above through the interfaces that configure war fighters to recognize relevant subjects and objects, in particular the discriminations that are the prerequisites for defensible killing.

I use the term “interface” broadly, to index the human-machine configurations comprising contemporary, remotely-controlled weapon systems (particularly armed drones and weaponized robots), and also immersive, computationally-based training simulations, which are my focus here. A central challenge for these simulations, as conceived by their sponsors and users, is the achievement of realism or verisimilitude between the simulation’s figurations and sites of projected operation, their
inhabitants, and potential events that might occur there. It is this challenge that the special effects know-how of the entertainment industry is called to address. The project of immersive simulation can be usefully placed within the larger frame of “cultural intelligence” considered by Ali (2016), as a legitimizing condition of possibility for both distant and proximate engagements. As Ali observes, “[t]he turn towards cultural intelligence endeavors to fill the spaces where strategic intelligence has failed, and in turn illustrates the failures of remote and tactile technologies to deliver the precise, targeted, warfare of the progressive imagination.” In this frame we might think about the promise of immersive simulation as the tactile supplement to imaginaries of virtuous war enabled by remote operations, the former underwritten by cultural intelligence acquired through proximate relations on the ground, the latter by intelligence, reconnaissance and surveillance from above.

In the case of FlatWorld, I am interested in whose imaginaries are at play in its design, at the intersection of the realism of stagecraft and the pre-scripted rehearsal of military operations. In a 2001 paper published in IEEE Computer, ICT Director Richard Lindheim and ICT Director of Technology William Swartout identify the relevant actors as “computer scientists, US Army personnel, and entertainment professionals,” and the goal as “developing the foundation for an experiential learning system” (p. 72). More specifically, they describe an early project, the Mission Rehearsal Exercise, commissioned by STRICOM “to create a virtual reality training environment in which soldiers will confront dilemmas that force them to make decisions in real time under stressful and conflicting circumstances” (2001, p. 72). Training challenges are intensified, the authors explain, by the post-Cold War expansion of US military operations, conducted across the globe and in close contact with local populaces. With this challenge in mind, they continue, the project enrolls artificial intelligence researchers at USC to create the “automated reasoning and emotional modeling technology for the virtual humans” who trainees will encounter (2001, p. 72). A universal, customizable template, the virtual human bodies are animated by researchers from robotics company
Boston Dynamics, and their faces are given expression by interactive virtual character provider Haptek. Creating the simulation content, Lindheim and Swartout explain, requires input from the entertainment professionals: “an art director to design the environment’s overall look, actors to serve as models for the virtual humans, and artists to model the animated characters, buildings, and environmental details” (2001, p. 74). Combining technical expertise in sound engineering, speech synthesis and real time graphics, these professionals provide the platform for shaping specific characters and scenarios, scripted to meet the Army’s training agenda.

The synthesis of art and science is not, however, without friction. While the entertainment professionals focus on the storyline arc and the simulation’s dramatic effect, behavioral researchers and military advisors are oriented to meeting the Army’s learning objectives. The challenge is to translate the Army trainers’ prescribed “events list” into alternative decision paths through the storyline, with clear pedagogical consequences for each decision taken. The authors offer as an example scenario a Mission Rehearsal Exercise set during Yugoslavia’s breakup in the 1990s. In the scenario, an actual lieutenant in training is instructed to rendezvous with his troops “to quell civil unrest arising in a small town” (2001, p. 74). His progress is interrupted by a reported incident in which an Army humvee has collided with a civilian car. The lieutenant, we are told, “sees a small boy on the ground, seriously injured, the boy’s frantic mother kneeling beside her injured child” (2001, p. 75). The situation is further complicated by the arrival of a TV cameraman, implying that “any mistake the lieutenant makes could appear on the international news.” The lieutenant’s dilemma then becomes whether to divide the forces, en route to aid their comrades in the intensifying civil combat, by ordering a medevac helicopter for the boy.

One of the project’s greatest challenges, the authors report, is the creation of believable virtual humans, imagined as stage actors programmed to enact the virtual characters. The virtual characters include some that are scripted, others that select dynamically from a library of
possible behaviors using “AI reasoning,” and “an emotional model for the one character in our scenario who really needed to show emotion, the mother” (2001, p. 75). Through the mother avatar affect is condensed into a familiar gendered object. Although suggesting an open-ended range of affective responses, the authors acknowledge that the mother’s model-based emotional range (triggered by other software-based events) is limited. They point to computer graphic software limitations at the time, which meant that the contact of virtual characters was rendered as overlapping edges rather than as touching bodies. In tension with the aim of a realistic depiction, they explain, this constraint meant that the virtual mother was unable to hold her injured son (2001, p. 78). As the mother’s affect is key to what comprises the trainee’s “stressful and conflicting circumstances,” the resulting breaches in the trainee’s suspension of disbelief mark at once the system’s weaknesses, and the justification for its further development. More realistic graphics and animation, the acknowledgment of this shortcoming implies, would produce more powerful affect, and more effective delivery of the training protocol.

Figure 3. Depiction of JFETS D, Ft Sill, Oklahoma, 2003. Archive photo courtesy of Jarrell Pair, FlatWorld project, ICT, JFETS_DEMO_2003/soldflat.jpg

Although the authors report that “audience” response to the Mission
Rehearsal Exercise was enthusiastic despite these limitations, the FlatWorld project foundered for lack of funding until 2003 (J. Pair, personal communication, 29 August 2012). That year, FlatWorld was reconfigured for a demonstration of the Joint Fires and Effects Training System (JFETS-D) installed at Fort Sill, Oklahoma. JFETS-D produced a non-interactive demo of a FlatWorld room in which soldiers rehearsed calling in artillery, bombs, missiles, and other munitions onto targets they were observing (J. Pair, personal communication, 30 August 2012, see Figure 3). At the Army Science Conference in November of 2006, a contractor for the Office of Naval Research (ONR) came by the ICT booth and mentioned that the Marines were interested in using the FlatWorld concept in a project that would become known as the Infantry Immersion Trainer (IIT) (J. Pair, personal communication, 30 August 2012). Aimed at pre-deployment training for the US Marine Corps, the IIT’s imagined geographies were figured around locations of US military operations at the time. More specifically, the IIT was positioned as a response to the ONR’s call for “an advanced training system that offers Marines an opportunity to become immersed in an Iraqi village without ever leaving U.S. soil” (Dean et al., 2008, p. 3). In a 2008 conference paper, design team members describe the IIT facility, built in a large, abandoned tomato factory at Camp Pendleton (Figure 4):

![Figure 4. Abandoned tomato factory, Camp Pendleton, CA. Left: Exterior of facility. Right: Interior of facility. Archive photographs courtesy of Jarrell Pair, FlatWorld project, ICT, Infantry_Immersion_Trainer IMG_3797; IIT_PICS_VID/IMG_5350.JPG.](image-url)
Although it is a vast and open building, when you enter the simulated town, the “roads” span about three people wide...All along the roads, one-room “houses” have been constructed, with real doors and windows. Inside, the houses are furnished with authentic furnishings, including tea sets, hookahs, and wall hangings...Smells are pumped into the warehouse giving it a musky scent. Individuals of Middle Eastern descent serve as role players. (Dean et al., 2008, p. 3)

Figured into the simulation, actual humans recognizable as “Middle Eastern”12 join with virtual characters to enhance the scene’s believability; “the warehouse comes alive as a mini-town direct from Iraq—from the sites, to the smells, to the faces, the Marines will enter a world that will introduce them to what they will encounter when deployed” (Dean et al., 2008, pp. 3-4). Among the challenges reported by the authors is control over the designed events as they unfold in real time. Live actors engaged in role-playing and virtual characters each pose difficulties; the former because of their range of possible actions and responses, requiring that they be carefully briefed, the latter because their limited interactivity necessitates continuous control by a human operator behind the scenes, and threatens to rupture the suspension of disbelief that animates the scenario’s realism. The simulation’s seamless immersion, the authors observe, “is most vulnerable at points where the virtual and the physical meet, especially where trainees interact with virtual characters” (2008, p. 5). For example, they explain that placing a virtual terrorist behind a couch is not as simple as projecting the character onto the wall above a physical couch in the room (see Figure 5).
A Marine is trained, the authors explain, to assess the threat posed by another through a “sweep” around or in relation to the other’s body. While the Marine can make the sweep, the virtual character has no physical volume, so the sweep will produce a view not behind the character, but only of the back edge of the actual couch meeting the actual wall. At the same time, the simulation’s promise is to render the actual person that it immerses reliably machine-like. The authors explain:

The IIT is a decision house that enables the individual Marine to significantly increase the tempo of his Observe-Orient-Decide-Act Loop (OODA Loop), the constant mental process during which a Marine is presented with a situation, develops courses of actions, makes a decision, and executes the decision. The IIT’s realistic/virtual environment serves as a stress inoculation tool, designed to inoculate the Marine rifleman from the sights, sounds,
smells, and chaos of close quarters urban warfare while enhancing his ability to make correct legal, ethical, and moral decisions under the stress of combat. (2008, p. 4)

This imaginary figures the Marine as an individual male body, forged through training into a triad of capacities: unflagging rational cognition, emotional invulnerability and perfect judgment. This promise of immersive transformation elides not only the phantasmatic nature of these idealized normativities, but also the inherent contradictions among the qualities listed, and the inevitable trauma of people called to embody them (see Brandt, 2016).

The system was first used by the Marines for training in November of 2007, and the press were invited to “embed” with the Marines in a demonstration training exercise in 2008. Interviewed by an ABC reporter, one service member stated that in his view only the lack of heat (an enhancement subsequently added) differentiated the simulation from Iraq. A supporting assessment came from Lance Cpl. William Hawkins, 21, of Kokomo, Indiana, interviewed by the San Diego Union Tribune, who stated in response to a question about the simulation’s fidelity that “it's definitely Iraq” (Rogers, 2008). The same article refers the facility’s virtuality back to actual civilian deaths in Iraq in 2004 and 2005; incidents that it reports caused “embarrassment” to the Marines. The article explains that “The new simulation program is designed to reinforce ethical conduct, hone small-unit infantry skills and sharpen Marines’ combat instincts.” Whatever tensions we might see between the goals of sharpening combat instincts and reinforcing ethical conduct, the article concludes that “The immersion program figures to be a central part of future infantry training as the Marine Corps continues its presence in the Anbar province of Iraq and will take on expeditionary combat in Afghanistan this spring.”

According to the formal assessment conducted by Dean et al. (2008), the training objectives against which the IIT was rated most highly were the application of Rules of Engagement and Escalation of Force (Dean et al., 2008, p. 7). The reference to Rules of Engagement brings us
back to the training objectives of military simulation, and to the question of
the real.

**Full Immersion and the question of the real**

To see how questions of realism haunt an immersive simulation like the
IIT, I turn to a Public Broadcasting Services (PBS) documentary produced
as part of a media demonstration of the IIT staged in September of 2007.\(^{14}\)
Titled *Full Immersion*, the film’s accompanying text explains that “This
32,000-square-foot, $2.5 million facility combines live action role players
and virtual Iraqis projected onto holographic screens to create interactive
battle simulations.”\(^{15}\) Anticipating the narrative that will be offered by the
film itself, the text continues:

> The IIT allows instructors to create complicated training scenarios
> on the fly. Virtual civilians appear alongside virtual insurgents,
teaching the Marines to make snap ethical decisions on when to
pull the trigger and how to implement the rules of engagement. The
screens even judge how well they aim. The Immersion Trainer also
prepares Marines for the stress of close-quarters urban combat and
the tactics of clearing houses.

This synopsis summarizes the promises and problematics of both the IIT
and the media’s rendering of it. The title cites the premise of “full
immersion” developed within the military imaginary of the “theater of
operations” prior to the advent of computational media (see Masco, 2014).
As described by the US Army:

> Theater immersion rapidly builds combat-ready formations led by
competent, confident leaders who see first, understand first, and act
first; battleproofed soldiers inculcated with the warrior ethos man
the formations. Theater immersion places—as rapidly as
possible—leaders, soldiers, and units into an environment that
approximates what they will encounter in combat. At the soldier
level, training is tough, realistic, hands-on, repetitive, and designed
to illicit [sic] intuitive soldier responses. It thrusts formations into a
theater analog soon after they arrive at their mobilization station and places stress on the organization from individual to brigade levels. Theater immersion is a combat training center-like experience that replicates conditions downrange while training individual- through brigade-level collective tasks. (Honore & Zajac, 2005, p. 3)

Designating most broadly the area within which the action is projected to occur, the theater metaphor connotes a bounded space that contains the action and maintains its adherence to the script that controls it. In the context of the IIT, this language obscures the actual ruptures of the simulation as a device, and of the training exercise as a genre. This mystification is reiterated across the narratives of both IIT spokespeople and embedded media reporters. Within this theater, the figures of the “live action role player” and the “virtual Iraqi” both promise to animate an “actual Iraqi” who is him/herself already a phantasmatic projection. These elements are to come together in an “interactive battle simulation” where, in the context of computational media, the interactivity is not only the pre-scripted or impromptu exchanges of the theater, but also now part of a wider technological imaginary of the smart machine. The latter is further invoked in the promise of programmability “on the fly,” and the inscription into the screen itself of assessments of the accuracy of fire. The simulation’s instructional pedagogy serves the rules of engagement, which include the challenges of discriminating between “civilians” and “insurgents” who appear out of nowhere and alongside one another, forcing a judgment based on immediately recognizable bodily signs in the service of “snap ethical decisions.” Finally, all of this is part of a wider frame of “close quarters urban combat” and the routinization of procedures of “clearing houses,” that is, war fighting under occupation, including forcible entry into people’s homes with guns drawn.

As the film opens, we follow a Marine squadron in close formation running past the camera along a narrow street, each Marine with a hand on the shoulder of the man in front of him. We see immediately a unit of connected bodies in close quarters, moving with a sense of readiness that
signals their anticipation of danger ahead. The danger is suggested not only by the orientation and formation of the bodies, but also by the soundtrack of calls to prayer—by now the iconic audio signature of the Islamic Other for Western audiences, and a reminder of the religious foundations (translated as fundamentalisms) assumed to support acts of insurgency against US-supported regime change. The camera and Marines arrive at a closed door, and we hear the command “Get that door down,” followed by the crack of a blow as the door opens into the interior of a room, revealing a bed and wall tapestry.

![Figure 6. Screen shot from Full Immersion](image)

The unit pours into the room, guns drawn, to face another wall out of our view. We hear a hail of bullets aimed at the hidden side of the room; the unit members turn in all directions and then call “Clear!” As the camera pans, we see somewhat discordantly not a bloody corpse, but a bullet-ridden wall onto which the image of a virtual character is projected—a woman in a head scarf shifting her eyes mechanically from one side of the room to the other (Figure 6). Who is she? We’re left to wonder. Who was the target of this shooting and where is the death and trauma that must follow an invasion of alien bodies and a blast of bullets into this intimate domestic space?
Figure 7. Screen shot from *Full Immersion*

The film does not dwell on these questions, however, but cuts to a title that tells us where we are: this is Camp Pendleton in California, and we’re witnessing the US Marine Corp Infantry Immersion Trainer. The film cuts back to an image of the opening scene, displayed this time through a black and white video monitor as we hear Douglas Rushkoff, the series “correspondent,” ask “So what’s that there?” The camera zooms back and we’re now behind the scene, in a control room filled with monitors and programmers’ interfaces. “That’s the actual avatar room that you were just in,” the operator explains, and then goes on to describe how his suite of cameras allows him to follow the action both outside of and within the system’s various rooms. The filmmaker’s camera cuts to a view of a monitor screen, showing various menus and code windows surrounding an image of two virtual characters, both facing the viewer—a young man with his arms at his sides (possibly kneeling, though his lower torso disappears off the bottom edge of the screen) beside a keffiyeh-scarved man pointing a weapon at us viewers (Figure 7). We hear gunshots, and Rushkoff exclaims, “Oh, he missed him” as the virtual characters direct their gazes to their right. “So what just happened there?” Rushkoff asks, “he shot that guy but he didn’t die?” Eliding differences between real and virtual bodies, the operator explains that the rooms have thermal cameras to register the dummy bullets’ impact on the projection screen, so if a
virtual character is shot anywhere—here he gestures to his own body—but in the heart, the spinal column or the head—“it might take several shots to take them down.” The film cuts to a full screen view of the bullet-ridden wall that we saw before, but this time beside the woman we see two gunmen (Figure 8) and watch as they first turn their guns in our direction, then fall below the bottom of the frame in a hail of bullets. This is a repetition of the opening scene, we assume, this time revealing the enemy that the house raid anticipated. We should mind the edits here, however, and the gaps, as presumably bleeding, dying bodies simply disappear below the frame, and continuities and coherences are intimated that belie the inevitable fragility of both the prototype technology and the careful staging of its documentary re-presentation.

Figure 8. Screen shot from Full Immersion

This account of the standard protocol of targeting and killing is followed by a dialogue between Rushkoff and the operator that establishes that the training happens in the IIT “almost every day.” A screen caption tells us that “Since its establishment in 2007, hundreds of Marines have trained here.” This is not, in other words, merely a demo but a working—and, by implication, effective—training facility, instrumental in shaping the professional competencies of those who have been subject to it. The scene then shifts to a room of actual human role-players dressed in traditional men’s garments and speaking in Arabic: we watch one man dressed in traditional dress shake hands with a Marine passing by on the
right. An explosion rings out and the role players duck for cover, as we hear a voiceover: “We describe what we’re doing here as mixed reality, live role players with pyrotechnics.”

The film cuts to a location just outside the facility where, with a group of service members in the background, Tom Buscemi, director of the center, offers a highly scripted and remarkably affectless account of what we have seen:

This was in preparation for the confusion, the chaos, that a Marine is gonna see on his first firefight. We want to inoculate the Marines with the sights, sounds, smells and chaos of close quarters battle, so that his first firefight or his next firefight is no worse than his last simulation.

The camera then cuts to a drop-down menu from which a selection is made, producing a stereotypical image of a suicide bomber strapped with explosives. We return to Rushkoff and the operator, who explains that the facility’s uniqueness comes from the ability to tailor scenarios specifically to the needs of a particular unit. We see another extended round of shots as Rushkoff exclaims, “He shot the woman...Was this a good one, what just happened?” “No” responds the operator, “because they hit an innocent civilian. We’ll debrief the points and say that they need to make sure that they have proper target identification.”

The scene shifts to an interior space, presumably the debriefing room, where a group of Marines are gathered, as an instructor enters and says, “Chaotic, right? Do we know what blew us up, by the way?” The camera pans to anxious faces. “An RPG?” offers one trainee. “Okay, that didn’t blow us up. It was a 155 shell gents, (gesturing) it’s only about that big, and about this big around, it was sitting there right on the ground. First fire team went right by it, because we’re not paying attention to our surroundings.” We catch a glimpse here of the real affective agencies that run through this pedagogy, including the call to demonstrate competency and the shame and stakes of failure.

We emerge from the facility now, through a door marked “authorized access only,” into the bright sunshine of the California desert,
where trainees testify to the realness of their affected bodies—sweating skin, pumping hearts—while also expressing appreciation for the simulation’s virtuality. Lance Cpl. David Osborn explains, “We’re in there, full gear and everything, and a face mask, you come out of there and you’re just drenched in sweat, and you’re still kind of pumped up from it and everything, and you’re ready to go through it again.” This testimonial to affected bodies is the lead-in to an extended sequence in which the participants address the simulation’s realism. “It’s way different than a video game,” Pfc. Taylor Vena observes, and another voice off camera agrees, “There’s no way you can even compare,” adding “With a video game, you can do it over and over and over again until you get it right.” “But ultimately,” Vena acknowledges, “you know that nobody’s going to shoot back at you in there.”

Figure 9. Screen shot from Full Immersion

There follows another edit of the first “clearing” episode, this time showing the screen with a virtual woman and child, standing behind the keffiyeh-scarved male (Figure 9). We hear a round of gunfire as the man falls, while the woman and child duck down to the bottom of the frame. The film cuts back to Buscemi, who asserts that “We’re doing multiple scenarios to demand that the Marines make the proper moral, ethical and legal decisions. So we pop up women and children, the innocents, mixed
in with the insurgents that these guys are most likely to find.” The camera cuts back to Pfc. Vena, who confesses, “I actually shot a civilian. Apparently, [the person] was standing a little too close to the insurgent and I was shooting with my left hand, so (small chuckle). It was a mistake, I’m just glad it happened on the screen and it really didn’t happen in real life.” The screen fades out as another unit is shown entering the facility, and we see a title explaining that the Marines we have “just met” are scheduled to deploy to Afghanistan later in the year. The difference between the Iraqi scenography that we’ve just witnessed and the premise of this as anticipatory immersion in an Afghan “theater” is left unremarked.


According to reports, US forces and Afghan military personnel entered the area on the night of 21 August in order to capture a local Taliban commander. During the course of their operations, the soldiers encountered enemy fighters, prompting them to request additional air support. (Gregory, 2012, p. 329)

General David McKiernan, US commander of NATO forces in Afghanistan, initially asserted that US forces who searched the village on August 22 found thirty to thirty-five bodies of “men of military age, and five dead women and children” (“Joint investigation,” 2008). This was subsequently contradicted, however, by radically different reports from the Afghan government and the United Nations, which confirmed the deaths of ninety civilians, seventy-five of them women and children. Initially blaming the discrepancy on “a very deliberate information operation orchestrated by the insurgency, by the Taliban” (McKiernan, quoted in “Joint investigation,” 2008), the US-led NATO coalition was eventually forced to reopen their investigation, confirming the larger number of civilian deaths. Further controversy attended the claim of “enemy fighters,” which conflicted with the village’s multiple connections to the Afghan police,
NATO and US reconstruction projects, and its avowed opposition to the Taliban. Moreover, the “Taliban commander” whom US officials claimed was successfully targeted, Mullah Sadiq, reportedly called the Radio Free Europe-affiliated station, Radio Liberty, several days after the raid and declared that he was alive and well and was not in Azizabad that night. Station reporters confirmed that they recognized his voice, had double checked the recording, and were sure that the caller was Mullah Sadiq (Gall, 2008). This incident and its contestations exemplify the “fog of war” characterizing counterinsurgency operations, and which FlatWorld’s training simulations are imagined to address. We cannot resolve, particularly from a distance, the multiple identifications, affiliations and aspirations of Azizabad’s inhabitants. But it is clear that the figurations that animate military operations, from the literal animations of FlatWorld to the categorical identifications deployed in the field, consistently betray the promise of accurate identification and justified killing on which counterinsurgency warfare depends.

Conclusion

Military investments in immersive simulation promise controllable interfaces through which war can be prospectively and retrospectively sensed. But as geographer Derek Gregory (2011b) reminds us, even bodies directly immersed in combat are systematically encapsulated within very specific, arguably parochial, geographies. In contrast to the premise that training, and particularly simulations of projected theaters of operation, expose the soldier to unfamiliar situations in ways that expand his or her understanding, we can also see how the simulation—starting with its figuration of relevant geographies as theaters of operation—guarantees that, in Gregory’s words, the soldier’s view is always and only that from ‘our’ side. I am interested in the ways in which training simulations like FlatWorld might work in the service of encapsulation, while at the same time they promise imaginative transportation of the bodies that they enclose into unfamiliar territory. In thinking the real and virtual
together, in terms of their connections and the differences that matter, these are processes that we need to understand better. In the context of ongoing US military operations, it is tempting to dismiss the significance of simulations in the face of the brutality of actual military force. But rather than set aside the virtual, I would suggest that we need to recognize its limits at the same time that we articulate its essential place in reiterating the modes of “situational awareness” that sustain the operations through which real injury is done.

So I close with a question: how can we think simulation and actuality together through their resemblances—their real, corporeal connections—and articulate their crucial differences, particularly when it comes to wounding and killing? How do we, like J, maintain our distance from the scene of battle? What does it mean to be immersed in a world but not of it? What are the leaky boundaries that undo the carefully crafted lines of connection and separation meant to keep “our” bodies safe and to maintain the difference between those of us who are addressed by the simulation, and those figured as its objects? Most central to the developments considered here, what is the relation between the virtual figure of the enemy, and “the enemy”? Military training in situational awareness develops on a premise of recognition of that which is already there, already a threat or not one. But if we think of “the enemy” in the way that Judith Butler first urged us to think of “sex,” we see that both terms are part of regulatory practices that produce the bodies that those same practices are designed to govern. Following this analysis, like sexual difference that is forced to conform to a gender binary, the “enemy” is, in Butler’s words, “an ideal construct which is forcibly materialized through reiteration” (Butler 1993, p. 1). And as Butler observes (1993, p. 2), that this reiteration is necessary signifies that materialization is never quite fixed, that bodies never quite comply with the norms by which their materialization is compelled. It is these constitutive instabilities that afford possibilities for transformative refiguration.

As with sex/gender after Butler, in other words, it should be impossible to think of “the enemy” in any way other than performatively, as
the effect of a regulatory ideal and an essential constituent of what we can call the military imperative. For the soldier, the enemy is not simply out there, but is one of the categories through which the soldier becomes viable, that which qualifies him or her within the military’s domain of cultural intelligibility. So if the construction of the enemy is not a singular or determining act but rather a process of reiteration, how might we reconceive training from training the body in recognition and response (the current conception of “situational awareness”), to training as itself productive of the entities to be recognized? As another mode of reiteration, simulation is then deeply implicated in performing the realities that it cites. We can then ask what are the discourses and material practices that hold military realities together and give them their agency, and with what interventions might we effect their further deconstruction and transformation.

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Notes

1 Flatworld was one ICT project within a larger initiative aimed at finding military applications for virtual reality technologies. A related line of development resulted in the Virtual Iraq/Afghanistan and Bravemind
Exposure Therapy systems, immersive simulation technologies designed for the treatment of post-traumatic stress. These systems have been engaged critically by Marisa Brandt (2013, 2016) and Emily Cohen Ibañez (2016), whose analyses inform and are deeply resonant with my own.

Many of us first learned this lesson from Donna Haraway’s writings on the lively commerce of the material and the semiotic (see Haraway, 1988, 1989, 1997).

Later configurations of the ICT technologies for the treatment of post-traumatic stress disorder were oriented less to realism than to scenarios specific to the individual who had experienced the event identified as the site of trauma. The premise was that these individuals did not need realism to evoke relevant memories. See Brandt (2013, 2016).

The dramaturgical figuration of military operations goes back even further, of course, beginning with the trope of the “theatre of operations” defined by Prussian General Carl von Clausewitz (1873) in his book on military strategy published as On War in 1832 (see also Masco, 2014). In Strategic Scenography: Staging the Landscape of War, Greer Crawley (2011) sets out the history of what she characterizes as the “scenography of war” beginning in the early twentieth century, and Andy Rice (2016) explores the theatrics and lived experiences of contemporary “rehearsals” for combat at Fort Irwin’s National Training Center. See also Stone (forthcoming).

Marisa Brandt (personal communication) points out that the office, now called PEO STRI (Program Executive Office Simulation, Training and Instrumentation), appears to have abandoned this slogan.

I should note here that the archive that I received does not include any proprietary or classified documents. Moreover, my characterization of the archive as a “fieldsite” recognizes the very different grounding of my account, not in lived experience and in situ engagement with the project,
but rather in my work with its documentary records.

7 See also Goodwin’s (1994) poignant account of the presences rendered systematically absent in the defense’s instructions to the jury on how to read a video through the lens of “professional vision” in the case of the Rodney King trial.

8 FlatWorld restages a simple gendered figuration of those involved in armed violence as male and those who are supplemental to it as female or child, notably lacking any evidence of women as combatants on either side. Women and children are of interest primarily insofar as their affiliations and affects are seen as consequential; for a critical analysis of the positioning of women as cultural mediators in the war zones of Iraq and Afghanistan, see Ali (2016).

9 That actors are taken as the referent for virtual humans is indicative of the ways in which realism in this context is affiliated with the “live exercises” of military training. See Rice (2016) and Stone (forthcoming).

10 See Dean et al., (2008) for more on how the logics of formal “training objectives” structure design.

11 The inclusion of the media in the scenario reflects the intimate incorporation of journalism into contemporary warfighting, expressed most explicitly in the form of the “embedded reporter.” On the place of the media as witnesses to “live” simulations, see der Derian (2009); Magelssen (2009); and Rice (2016).

12 On the realities and multiplicities behind this figuration see Rice (2016).

13 Archive video ABC/KGTV, January 2008, FlatWorld project, ICT.

In this same summary, the facility is described as “a product of a decade of investment by the Office of Naval Research,” a simplification of the ups and downs of funding evidenced in the FlatWorld archives.

This is echoed in the metaphors of “the Box,” and more specifically “the Sandbox” as designations of the simulation created at the National Training Center at Fort Irwin (Rice, 2016), and more recently the “Kill Box” as the just-in-time battlespace of what geographer Derek Gregory has named “everywhere war” (2011a).

Marisa Brandt observes (personal communication) that it is the simulation’s alignment of ‘our’ positioning with that of the service member trainee that produces this “us/friend” and this “them/enemy.”

The premise that the conditions of combat can be articulated in the form of scenarios is the anticipatory twin of the treatment of post-combat trauma through its narrativization according to standardized scripts in the “virtual therapy” system Bravemind described by Brandt (2016). This link suggests that combat itself comprises a kind of unspeakable lacuna between the orderings of training on one hand, and of treatment on the other. A key question, underscored by Brandt, is whether these stories acknowledge their politics and their complex relations to the lived experiences that they cite, or work to neutralize the latter’s effects. See also Cohen Ibañez (2016).

In a critique of the categories of “civilians and combatants,” Christiane Wilke (in press) observes how the designation of “women and children” as the canonical form of the former supports the equally indiscriminate association of “military-aged males” with the latter. These stereotypes are reproduced uncritically in the IIT scenario that we witness; as Marisa Brandt points out (personal communication) gender here produces virtual defendable bodies as well as killable ones. See also Chandler (2016).
The virtues of a ‘safe’ space for the anticipatory or retrospective experience of traumatizing events is a premise that conjoins training and therapeutic simulations, and also the central tension in their promise of realism (see Brandt, 2016; Cohen Ibañez, 2016).

See footnote 8 regarding the politics of these categorizations.

Appendix: Video Transcript

(J, waving at the scene) “So I’ll do a few things here (turns to tablet). One thing that I’d like to show (turns to open door in right wall, revealing continuation of the scene outside) is the fact that (gestures) this is one contiguous world out there. (UAV appears through doorway, flying across from the right.) So here you have an unmanned vehicle flying through the environment (crosses over to front flat) and there you see it on the other digital flat (bringing tablet into close up to show). We can export that UAV’s camera to any external display, and we can use that to pick out targets, you know, find adversaries, that sort of thing. (Turning to tablet, with input pen, then back to camera.) And I can do a lot of things to dynamically raise or modulate the stress level of the environment, for example.” (Very loud sounds of helicopter, which then appears in front window and lands in street; J goes over and closes the door, helicopter takes off again.)

“One nice thing about FlatWorld (gesture towards window) is that when you encounter a virtual human, that figure is in life size. So to illustrate that we have a few demos. (Input to tablet, sound of loud knocking from door.) If someone knocks on the door here. (Goes over to door, another input to tablet, opens door to reveal stereotypic masked gunman.) Whoops, it’s a bad guy. (Avatar yells in Arabic, then opens fire; J stands impassively, tablet in hand, makes him disappear.) (laconically) Shoot him.”

(closes door) “And of course all of this you’re wearing polarized glasses, it’s all in 3D, that guy’s gun points out, it’s very dramatic. (Turns
back to tablet, sounds of loud knocking.) Somebody else knocks on the door (he opens it, figure of US soldier appears cautiously from left side) and it’s our hero who, we’re trying to imply that he actually shot that guy.” (Stands back to watch.)

Avatar soldier: “This is a hostile area, get out of here now!”

(J walks around to face front flat, inputting into tablet.) “So this place suddenly becomes very dangerous.”

Avatar soldier: “(unintelligible) wait outside, go go go!”

(Car appears on street with gunman firing from it; helicopter reappears flying in overhead; J walks out at door back of room.) “So we escape through this door.”

(J enters into dark alley-like exterior.) “The sound is not on” (some adjustments being made) “So, we walk outside, and we have the humvees are waiting for us. (camera moves in on view of humvee with US soldier beside it in firing position; helicopter flies overhead, hovers; sound up to right.) We hear a shuffling (camera pans up and to right; figure of Iraqi adolescent boy looking down from a balcony above) It turns out to be this child up here.” (Camera zooms in on figure.)

Avatar child: (waves) “Hey US, over here! Hey US, over here!”

J: “He proceeds to taunt us, then throws rocks (Avatar does so; sound of rock hitting floor) “So uh (camera zooms back into wide shot of room) You can see when he throws the rock, it bounces down here.”

References


**Bio**

**Lucy Suchman** is Professor of Anthropology of Science and Technology in the Department of Sociology and Co-director of the Centre for Science Studies at Lancaster University, UK. She is president of the Society for Social Studies of Science (4S) and collaborating editor for the journal Social Studies of Science. Her current research examines human-computer interaction in contemporary warfighting, including the figurations that inform immersive simulations, and problems of "situational awareness" in remotely-controlled weapon systems. She focuses on whose bodies are incorporated into these systems, how and with what consequences for social justice and the possibility for a less violent world.