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SuperGaming: Ubiquitous Play and Performance for Massively Scaled Community

Jane McGonigal

The [digital] utopian communitas exists as an imagined community, as the Mystical Body. Real community exists, on the contrary, where people throw their lot together and stand in face-to-face ethical proximity.

Michael Heim 38

A design imperative for social software engineers, game developers, network designers and all the other architects of digital community: more, more, more.

Why more?

"The more the better" (Andrew Fluegelman, founding member of the 1970s New Games Movement, on the optimal number of players for their patently oversized and intensely physical games [141]). Players experience phenomenological pleasure in being part of a much larger, co-present whole.

"More is different" (P.W. Anderson, physicist, on the emergence of unpredictable atomic interaction in complex particle systems [373]). Unexpected things happen when you scale up.

"More is needed" (Pat Miller, computer scientist, on the massive number of Central Processing Units required to construct a "do-it-yourself" supercomputer [2]). To become exponentially more powerful, to pass the coveted threshold to "super," you need to connect as many individual parts as possible.

These three tenets comprise the more, more, *massively* more connectivity I dream of for network communities in today's new-media landscape. Massively more is a vision of digital social networks designed and deployed to produce more pleasure, more emergence, and more superpower, through community formation on a massive scale.

This vision flies in the face of one of social software's favorite conventional wisdoms: digital communities don't scale. Current social-network theory holds that the twin hallmarks of online community – "mutuality," or the opportunity for two-way communication, and "density," or the existence of enough internal connections that a majority of members know and interact with each other – are increasingly difficult to maintain past a certain growth point. The generally accepted threshold at which community decline begins is 150 members, and beyond 10,000 members is considered by many online community experts to be absolutely untenable.[4] But in 2003 and 2004, a single city block in downtown San Francisco served as the staging area for a series of four social-network scaling experiments, in which spectacularly co-present communities of hundreds and even thousands of members were created via pervasive digital platforms. Together, I believe these playful and theatrical experiments show social networks to be significantly more scalable than was previously thought to be possible or, in some cases, desirable. Indeed, contemporary experiments in and around the emerging culture of pervasive gaming chart the course of the future of collective engagement.

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First, the four experiments:

12 June 2003, San Francisco – Over 450 people, most of whom have never previously met or communicated with one another, take over a Market Street neighborhood for three hours, adopting superhero personas and racing to complete a series of public adventure missions. They download site-specific Go Game challenges onto their mobile phones and roam the streets, assembling ad-hoc superhero costumes, staging provocative digital photographs and videos, and performing their downloaded stunts with the help of recruited passersby. The players receive additional live direction from two-dozen secret agents (actors) planted in plazas, cafes, banks, offices and back alleys. The producers call the Go Game an "urban superhero adventure." They call this particular event "a Go Game of massive proportions" (Fraser and Kelly).

16 July 2003, San Francisco – Over three-hundred people, most of whom have never previously met or communicated with one another, occupy the pedestrian crosswalk at Market Street and 4th for ten minutes, spinning back and forth like whirling dervishes every time the traffic signal flashes "Walk." Although the spectacle has been

designed to appear spontaneous, its participants actually have been carefully organized and directed through a week's worth of e-mails, text messages, listservs, and other forms of digital word-of-mouth. Digital photos and videos taken by participants in *Whirling Dervishes* find their way onto over five-thousand Web sites, the front page of the *San Francisco Examiner*, and an international broadcast of CNN's *Headline News*. The organizers call the performance a "flash mob" (Savage).

3 April 2004, San Francisco – Over seven-hundred people, most of whom have never previously met or communicated with one another, converge on the gymnasium at the University of San Francisco for an entire day, networking their mobile personal-computing devices to create the world's first grassroots supercomputer. As the supercomputer works, they set up a parallel network of Xbox consoles and hold a *Halo* video game tournament. The hot pink flyer for the event reads, "Come and Change the World!!! … DO YOU LIKE TO PLAY COMPUTER GAMES?" ("Come and Change the World!!!") Participants turn t-shirts into makeshift superhero capes, while one impromptu lecturer on the history of supercomputers rips off his button-down white shirt mid-talk to reveal a Superman costume underneath. The *New York Times*, CNN, and the National Electronic Gaming League report on the group's do-it-yourself supercomputer, which achieves a top speed of 180 Gigaflops per second.[5] The coordinators call the whole event "flash mob computing […] the next wave in supercomputing" ("Welcome to FlashMobComputing.org").

24 August 2004, San Francisco – Over four-thousand people, most of whom have never met in real-life, conspire to launch a twelve-week occupation of nearly one-thousand United States payphones, including a dozen phones on San Francisco's Market Street. Their regular, small-group gatherings at the far-flung payphones, which they locate using GPS devices, are part of *Halo 2*'s *I Love Bees*, an alternate reality game with an online player base of nearly half a million and an online spectator base of over two million. At the payphones, players use their mobile media devices – including Wi-Fi laptops, camera phones, and Personal Digital Assistants (PDAs) – to construct an ad-hoc, distributed, problem-solving network with their online collaborators. They show up at the payphones in costumes and with armloads of props; digital photos, videos, and art installations created by players at the payphones appear in the *New York Times*, on CNN, and Tech TV, and on more than ten-thousand Web sites. The players both receive phone calls at the payphone sites and make them, to fellow players and to random strangers, who are asked to become a part of the massively collaborative effort: "Help us save the Earth from alien invasion!" The game designers call *I Love Bees* payphone missions "flash mob gaming."[6] The game players call them "flash mobs," as well (Peters).

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Urban superhero gaming, flash mobs, flash mob supercomputing, and flash mob gaming – each of these San Francisco–based events is an example of significantly scaled, digitally connected community made possible by the turn-of-the-twenty-first-century rise in ubiquitous computing.

"Ubiquitous computing" (*ubicomp*, for short) is the practice of connecting and embedding increasingly smaller and more mobile computing devices and network technologies in everyday environments and public spaces. When it comes to scaling network infrastructure, ubiquitous computing has been an unparalleled success. In his seminal ubicomp manifesto *Me++: The Cyborg Self and the Networked City*, new-media theorist William J. Mitchell describes his first moment grasping the massively pervasive reach of the ubicomp network: "The single wireless link had exploded into a dense, global web of wireless infrastructure; if you counted all of its terrestrial, satellite, and spacecraft linkages, it was now humankind's most extensive single construction" (2). But despite this successfully massive scaling of the infrastructure, the idea that ubicomp technologies could be used within the global digital network to create better massively scaled *communities* – that is to say, social networks with more communications mutuality and a higher density of connections – runs absolutely counter to prevailing assumptions about how ubiquitous computing affects social life.

In *Me++*, Mitchell points to dozens of sociological studies and articles that support his notion that the simultaneous *scaling up* of networks and *scaling down* of the apparatus for transmission and reception has dramatically weakened community structure (2). Ubicomp users form extended social networks, with "few strong social ties and many weak ones," Mitchell's research suggests, and these digitally connected communities are "far less dense" and "more scattered and unstable" than their non-pervasive counterparts (17). "The electronic glue has grown much stronger," Mitchell writes, and users of ubicomp technologies like cell phones and Wi-Fi hot spots are able to create connections across geographic space where previously it was impossible (17). The effect of being able to hold so many people together for so much of the time, ubicomp theorists argue, is that social networks are increasingly "sparsely knit" – communications from user to user are abbreviated, and the concentration of attention on any particular node (connected user) diffuses considerably (Mitchell 17).

The pivotal assumption that Mitchell and others make regarding the weakening of social networks is that digitally driven interaction in an ubicomp environment lacks significant local, or "face-to-face," contact. When discussing scaled, mobile connectivity, they emphasize the virtual geographic reach ubicomp technologies afford users, not the new kinds of same-space interactions they enable among digital users. Of course, Mitchell's *Me++* does not ignore local experience or physical space entirely – to the contrary, its primary purpose as a manifesto is to demand that new-media designers and researchers attend more to ubicomp users' experiences of real-world spaces, local context, and site-specificity. But while Mitchell attends to his goal of reconnecting the virtual and the material, or "cyberspace and meatspace," as he puts it, he does not talk about spatially reconnecting his users (3). Instead, he views the "thinning out" of the geographic density of ubicomp communities – what he calls the "dramatic dispersal" of connected individuals from each other – as a kind of wonder of technology. (17).

The development of "massively more" community clearly depends on reversing this dramatic geographic dispersal. Local proximity to a majority of other community members and a physical experience of the *mass* of a massively scaled group are two challenges to the dominant paradigm of distributed, ubiquitous computing made by the Market Street Go Game, flash mob, flash mob supercomputer, and flash mob gaming. Each of these four uses structured *proximate* play and a spectacular *collective* aesthetic – the simple shock of seeing so many people assembled doing something out of the ordinary – to maximize the pleasure, emergence, and superpower of the digitally organized members.

And the San Francisco–based events are not isolated examples of this reversal of the dramatic geographic dispersal of digital community. Since the summer of 2003, thousands of flash mobs have been produced on six continents. Playful groups of fifty to five-hundred participants have each connected locally, via ubicomp technologies, to flash mob public hot spots in hundreds of cities, from Mumbai to Mexico City to Madrid. (An effort to flash mob the seventh continent by mobilizing 250 residents at the McMurdo Research Station in Antarctica is still underway.) Likewise, more than twenty-thousand people have participated in site-specific Go Games in over fifty cities across the United States, including a February 2004 game, with more than eight-hundred simultaneous local players, in San Jose, California. Other urban superhero games, such as Intel's 2004 locative media project *Asphalt Game*, Blast Theory's 2004 *I Like Frank*, and It's Alive's upcoming 2005 launch of *Botfighters 2* have attracted tens of thousands of pervasive gamers everywhere from New York City to Adelaide to Helsinki to Moscow. Meanwhile, public access to, and playful deployment of, supercomputers is a growing trend. Stephen Beck's 2005 *Neumeaux*, a Los Angeles–based installation supercomputer for computational arts, and Cray-Cyber's ongoing weekly "tele-parties" for public supercomputing, hosted by the Munich Association for Historic Computers, continue to push do-it-yourself supercomputing in a spectacular direction. These efforts create an awareness of and community for events like flash mob supercomputing. And more than a dozen alternate reality games, with real-world components in the United States, Europe, Australia, and Asia, have sprung up in the wake of *I Love Bees*, including Adventure Gamers' *Still Life*, GMD Studio's *Legend of the Sacred Urns*, and Mind Candy's *Perplex City*.

Within the larger context of these developing genres, however, the four San Francisco–based examples are particularly important case studies of emerging trends. Taken together, they demonstrate an evocative geographic nodality, a physical manifestation of the techno-cultural hub they represent. This hub includes the alliance of social "smart mobs" (Rheingold) with theatrical live action role play (or LARPing), the joining of forces between a problem-solving supercomputing culture and an action-oriented superhero culture, and the convergence of online console gaming (e.g., XBox Live) with mobile network culture. The four Market Street experiments also each marks a historic first. The 12 June Go Game, for instance, not only was the first massively scaled effort from Wink Bank, Inc., which previously had produced dozens of games for thirty to one-hundred simultaneous players, but also set a U.S. record for simultaneous local participants in a wireless-technology adventure game. And the "whirling dervish" event was the first flash mob conducted outside of New York City, where the genre originated. It was intended as a proof-of-concept that what was initially perceived as a cliquish, "only in New York" activity could be used to create community anywhere in the world. The flash mob computing project also announced itself as a proof-of-concept. The organizers' goal was to demonstrate, for the first time, that in sufficient numbers, ordinary people with everyday computing equipment could cross the threshold to supercomputing. And the payphone missions of *I Love Bees* made it the first *pervasive* – that is, taking place in the real world, on public display – alternate reality game (ARG) ever, as well as the largest (in terms of number of players and temporal duration) pervasive campaign conducted in the United States to date.

Together these four particular experiments in massively scaled, public collaboration comprise the avant-garde of an emerging constellation of network practices that are both *ludic*, or game-like, and *spectacular* – that is, intended to generate an audience. I call this tactical combination of network-based play and spectacle, "supergaming."

The term "supergaming" is intended to invoke four key attributes of the trend. Supergaming is massively scaled, as in super*sized* gaming. Supergaming is embedded in and projected onto everyday public environments, as in

super*imposed* gaming. Supergaming heightens the power and capabilities of its players, as in super*hero* gaming. Finally, supergaming harnesses the play of distributed individuals in a high-performance problem-solving unit, as in super*computing* gaming. In other words, supergaming is both a robust design solution to the community-scaling problem and a potential catalyst for redefining what we mean by and expect of "community" in a new-media context.

My own position in analyzing the four San Francisco–based examples of supergaming, I should make perfectly clear, is anything but neutral: I was a flash mob organizer, a writer for and frequent performer in the Go Game, a participant in Flash Mob computing, and the community lead for *I Love Bees*. And I believe, from my firsthand experiences designing, directing, and performing in these experiments, not only that massively scaling digital communities is possible, but also that scaling leads to the emergence of important changes in our understanding of the network, of the possibility of digital community, and indeed, of community itself. Massively scaled digital communities provide significant leverage for updating and reworking our larger theoretical construction of digital virtuality and its relationship to the "mass" in massive – that is to say, the physical and corporeal interfaces and platforms for virtual experience in a ubiquitous-computing age. More, as Anderson writes, is not just bigger, it's different: supergaming provides a paradigm for both critical and practical engagement with the promising possibility of massively scaling digital community.

By using the concept of supergaming to map multiple dimensions of community scalability and to identify the technologies and aesthetics through which these dimensions might be extended, I hope to demonstrate that real-world gaming structures and pervasive performance strategies can be understood as a kind of offline social software, suited to the dual challenge of scaling and reimagining digital community. But to appreciate why and how supergaming may be capable of making this intervention, we must first examine some of the current and most prevalent assumptions about, and valuations of, massively scaled digital community.

THE SCALING CHALLENGE: AUDIENCE VERSUS COMMUNITY

In April 2002, new-media theorist Clay Shirky published a short online essay entitled "Communities, Audiences, and Scale." In this essay, Shirky advances two key claims regarding the scalability of online groups: first, that assemblages of new-media users behave as either "audiences" or "communities"; and second, that of these two modes of digital assembly, audiences are infinitely scalable, while communities are not. In the weeks that followed its publication, hundreds of bloggers and technology journalists took up the essay's primary claims in a debate over the feasibility and desirability of massively scaled digital community. Five years later and after more than a hundred new-media essays authored by Shirky, "Communities, Audiences and Scale" still ranks consistently among the top three most frequently downloaded articles in Shirky's highly trafficked collection. Thus, Shirky's influential framing of the "community versus audience" binary continues both to dominate discussion of the scaling challenge and, more subtly, to shape notions of what community means in the digital landscape. At the same time, a closer reading of the debate Shirky provoked enables us to see alternatives to the terms he proposed and so to reconsider scaling in ways that sustain the notion of massively scaled digital communities.

In "Communities, Audiences, and Scale," Shirky sets up his argument against massively scaled community by asserting the fundamental difference between audiences and communities in a media environment: "Though both are held together in some way by communication," he writes, "an audience is typified by a one-way relationship between sender and receiver, and by the disconnection of its members from one another – a one-to-many pattern." In contrast to this one-way broadcast and disconnected reception, Shirky claims, in community, "[P]eople typically send *and* receive messages, and the members of a community are connected to one another, not just to some central outlet – a many-to-many pattern" (emphasis added). Community, in other words, arises from a two-way relationship and a multiplicity of network nodes, that is, points of intersection among its members that afford direct communication and social interaction. The higher the *density* of connections among group members, the more the group resembles a community – density creates a structural potential for widespread and consistent mutual exchange and interaction. Conversely, Shirky suggests, the lower the density of connections, the more a group behaves like an audience.

In defining "audience" and "community," Shirky identifies "communication" and "expression" as the primary functional purpose of the network nodes. A message or media content is distributed via these nodes, either one-to-one (community) or many-to-many (audience). Social interaction is essentially limited to verbal exchange – like e-mails; bulletin-board posts; chats; text messages; blog comments and RSS feeds ("rich site summary" feeds or "really simply syndication" feeds, depending on who you ask); or point-of-view actions, like rating, voting, and ranking, in which numbers substitute for verbal language as means of expression.

Having proposed the communications-based differences between being a member of a community and being a member of an audience, Shirky then makes a rather surprising move for a technologist: he classifies the difficulty of scaling digital communities as a fundamentally *non-technological* problem. "[T]he larger a group held together by communication grows, the more it *must* become like an audience," he writes, "[…] and there is no easy technological fix for that problem" ("Communities"; emphasis added). Here Shirky makes what was, at the time, a highly counter-current, and to many counter-intuitive, point: that no matter how far we advance toward an open, two-way media environment on the World Wide Web, "the characteristics we associate with mass media are as much a product of the *mass* as the media" (emphasis added). That is to say, the fundamental platform for communal relationships – the human being – cannot be rewired or reprogrammed to perform community functions at massively scaled levels, no matter how advanced the social software (e.g., a Web browser or social networking program) or peripheral support (e.g., a cell phone or Wi-Fi laptop).

How does Shirky support his rejection of digital means to a massively scaled end? According to Shirky, new communication technologies cannot change the fundamental socio-mathematics that determine the essential quality of human interaction in large groups. He cites primatologist and cognitive scientist Robin Dunbar's research on human social networks as evidence of a natural barrier to community scaling, online or offline. In *Grooming, Gossip, and the Evolution of Language*, Dunbar's landmark 1998 work, the author concludes that the human brain is optimized for keeping track of social relationships in groups of 150 or less. Past that number, the quality of the connections inevitably erodes: individuals must choose between willingly disconnecting from a significant part of the group or treating the whole group as an undifferentiated mass, an *audience* rather than a variegated *community*. Shirky writes in agreement with Dunbar: "As group size grows, the number of connections required between people in the group exceeds human capacity to make or keep track of them all," and therefore, connection density within a community diminishes and it becomes more like an audience ("Communities"). Shirky's point here is easier to grasp through examples. A group of five-thousand individuals, for instance, has just under 12.5 million potential nodes of connection among its members – that would be 100 percent connection density, in which everyone knows everyone else.[7] But by my calculations, Dunbar's research and Clay's adoption of the 150 limit would suggest that at absolute best, only 375,000 connections (150 relationships per member) would be made. Those 375,000 connections equal just 3 percent of possible connections, an extremely low density compared to that of a group of, say, five hundred, where, through individual connections of 150 per member, 30 percent of the 249,500 potential connections could be achieved.

From Shirky's perspective, then, the lower the density of a group, the lower the percentage of the possible connections that are actually achieved and so the more the group grows to resemble a cluster of two or more related audiences who receive broadcasts from and interact with a comparatively small subset of "super users," the most well-connected members. Shirky, therefore, concludes firmly: "Because growth in group size alone is enough to turn a community into an audience, social software, no matter what its design, will never be able to create a group that is both large and densely interconnected" ("Communities").

Shirky's strongly worded conclusion – *never, no matter what* – was not accepted wholesale by his readers and respondents. However, his premise – that, over time, growing groups will inevitably shift from the mutuality of communities to the asymmetry of audiences – has, by and large, been adopted by both critics and designers of new-media applications. Thus, the two issues that remain most in contention are: Can we push the magic number at which this community-to-audience shift occurs higher through network technologies? and What's really so bad about groups becoming more audience-like, anyway?

On the issue of the "magic number," noted blogger and techno-theologian the Rev. Dr. A.K.M. Adam wrote a characteristic response to Shirky's essay. "Size *does* matter online," he acknowledges, but "'150' represents a reference point on a sliding scale, not an absolute limit no one can traverse." Network technologies, he suggests, "may introduce interactions whose tenor affects community-size calculations *differently*." But despite showing an interest in at least moderately scaling communities, Adam goes on to reinforce Shirky's claim that communities are not *infinitely* scalable, concluding, "None of which disproves Shirky's general point that the goal of a vast, intimately-linked community of comradely, networked buddies may be an asymptotic ideal – but then, I haven't heard anyone who thinks that infinite intimacy holds any particular appeal." Adam, like many of those modestly revising Shirky's claims, is content to push the bounds of community slowly upward rather than dream of *massively* more.

And on the issue of audience fallibility, a characteristic response to Shirky's claims was published by computer engineer and "master blogger" Andy Chen. Like Adam, Chen dismisses the need for massively scaling community. "Both Shirky and A.K.M. Adam agree that communities that grow to a certain size will start acting like audiences," he writes. "[H]owever, this should not be construed as a weakness." Instead, Chen argues, "The growth of an existing community into an audience model isn't a weakening. It's an evolution. The initial community can then

serve as a hub for the newly formed ones. A 'too large' community shouldn't try to avoid becoming an audience." For Chen, community scaling may result in a breakdown of the initial community, but this is valuable for its ability to generate higher numbers of moderately sized, "breakaway" communities.

Today, in large part as a result of the success of the community-becomes-audience framework, Shirky and many other leading Net theorists and practitioners support what is called the "situated software" design ethic. This ethic is best defined as "a refusal to embrace scale" as a value (Shirky, "Situated Software"). Its supporters aim instead for micro- or moderately sized community development.

Supergaming experiments like Go Games, flash mobs, flash mob supercomputers, and flash mob gaming run directly counter this situated software trend by embracing scale as an achievable value. They represent a return to the scaling challenge that Shirky rejected in his seminal 2002 essay, and they resist the popular, post-Shirky assessments of doomed community scaling. Supergaming is the antithesis of situated software. Nevertheless, supergaming and its practitioners embrace Shirky's structural model of community, along with the value of scale. That is to say, supergaming adopts Shirky's two-part definition of "community," in which the opportunity for mutuality, or two-way communications, and a density of connections among members are both necessary to distinguish "community" from "audience."

Yet, while supergaming adopts Shirky's definition of community, it radically reimagines how these communications and connections take place. Specifically, supergaming challenges two assumptions made by Shirky and others by asking whether the essential functionality of network nodes in a community must be restricted to verbal expression and linguistic interaction, or whether social network nodes might instead be points of *physical* interaction. And beyond that, does two-way communication need to represent a mutuality *within* the group? Could members' communications, instead, be collectively devised and projected outward at some external audience? I would like to consider each of these challenges individually, and playfully, by drawing inspiration from two decidedly non-digital subjects: monkey grooming and 1930s radio.

PHYSICAL NODALITY: THE SUPERGAMING MODEL OF DENSITY

Shirky's argument against massively-scaled communities directly depends on the work of primatologist Robin Dunbar, who initially set the magic number of 150 as the threshold at which human social networks begin to break down. But Dunbar's writing about *monkey* social networks indicates, if we are willing to learn from them, a surprising countermeasure to the strong upper limits of digital community based on communication nodes – a *non-linguistic,* or what Dunbar calls "primordial" way to achieve density of connections.

Dunbar's analysis of the scalability of human social networks begins with the following supposition: humans originally developed language as a more scalable substitute for the physical intimacy of grooming. Among most primates, Dunbar states, grooming is the social glue that holds the community together. However, when survival prompts human communities to expand beyond the numbers at which it is possible for each member to maintain constant physical contact with every other member of the group, a different mechanism for maintaining group cohesion and identity is needed. In order to sustain the larger networks necessary for survival, Dunbar suggests, human beings developed language, a significantly more scalable technology than physical touch.

Yet Dunbar's rather rapturous description of the grooming experience, points to a co-present structure of communication that actually affords a more ambitious scaling of community – for pleasure, play, and high performance, if not for outright evolutionary survival. Dunbar writes,

> To be groomed by a monkey is to experience primordial emotions.[…] The experience is both physical sensation and social intercourse. A light touch, a gentle caress, can convey all the meanings in the world: one moment it can be a word of consolation, an apology, a request to be groomed, an invitation to play […] Knowing which meaning to infer is the very basis of social being, depending as it does on the close reading of another's mind. In that brief moment of mutual understanding in a fast-moving, frenzied world, all social life is distilled in a single gesture. (1)

Here, Dunbar describes a semantically rich interaction that achieves mutuality of expression without language. This "wordless pageant" of physical connection, as Dunbar describes it, suggests a natural, alternate infrastructure for social networks: a community connected through nodes of physical intimacy (3). And with ubiquitous computing giving network members massively scaled mobility, the opportunity to place multiple users in a physical proximity that supports this alternate infrastructure is increasingly available. (*I Love Bees* directed geographically dispersed players to the same payphone site by posting sets of GPS coordinates, dates, and times online, for example; while the Go Game allows multiple cell phone users to download mobile clues and cryptic directions to the same locations.) And in these cases, the physical density of participants in a particular space (450 Go Gamers in a six-block span of public space, or seven-hundred supercomputer fans in a college gymnasium) adds a parallel dimension

of network density. The higher this embodied spatial density (that is to say the more people packed per square foot), the more likely participants are to experience the "physical sensation" and "social intercourse" of a gesture-based nodality.

Massively collaborative grooming, of course, seems an improbable gesture for scaling human social networks. But the underlying notion that a community can be connected in shared space through non-verbal gesture and even direct physical contact has considerable resonance with the avant-garde of ubicomp play and performance. Dunbar's account of monkey grooming evokes a phenomenological encounter that mirrors the experience of whirling by the hundreds in a single pedestrian crosswalk, never uttering a word as to why you are there or what you are about to do. (This is a rule of the flash mob – do not say anything to anyone.) In Dunbar's description of sensing meaning through gesture, I see a direct corollary to the experience of roaming a six-block radius and communicating to the other Go Gamers (through costume and through shared, secret gestures) that you are part of the temporary superhero conspiracy.

Or consider, for example, a fifth case of supergaming, Austrian art-technology group monochrom's Massive Multiplayer Thumb-Wrestling (MMTW) project. Launched on 27 May 2004, the MMTW project is a playful appropriation of network architectures for physically co-present play. Based on the thumb-wrestling folk game in which two players grasp hands in a single fist and battle to pin down each another's thumbs, monochrom describes MMTW as follows: "This experimental project engages low-fi sweaty-fingers-entertainment and places it in the high TCP/IP [Transmission Control Protocol/Internet Protocol] context of recent Massive Multiplayer Online Gaming" ("Massive"). Through this tongue-in-cheek description, monochrom challenges a massively multiplayer *online* game's monopoly on massively multiplayer gaming in general. In other words, monochrom wants to put massively multiplayer gaming in real, everyday spaces (as evidences by their photo spread of MMTW games in public plazas.) But how do you scale a game as micro and personal as thumb-wrestling?

While thumb-wrestling is traditionally a two-player game, monochrom outlines a set of rules for eight different massively multiplayer thumb-wrestling games inspired by real, massively scalable, digital network architectures. The *Kazaa* Peer to Peer (P2P) MMTW game, for instance, reflects the massively scaled P2P architecture of the popular file-trading program *Kazaa*. It is played as follows: as many three-player-knots [three hands are joined into one fist with three competing thumbs] as possible are built. Then these knots are connected via the players' free left hands ("Massive"). Here, the as-many-as-possible element of the P2P rule set reflects the grand scaling ambition of the project, while the three-person clasped fist serves as the new, touch-based mode of nodality. The designers of MMTW write of the three-player-knots: "It is possible to put together three hands of three players who want to indulge in thumb-wrestling. A *nodal network* is formed" ("Massive"; emphasis added). Through these new embodied nodes, monochrome writes, unlimited numbers of players can connect to join a Multiplayer Thumb-Wrestling Network. As the number of players is unlimited, global thumb-wrestling may emerge through self-sustaining peer-to-peer networks and ad-hoc socializing. Here, monochrome adopts the technical language of networking specialists to express a playfully grand vision of connected thumb-wrestlers. And while a globally scaled thumb-wrestling war has yet to be conducted, the publication online of the MMTW rule sets has enabled plenty of playful network-scaling experiments around the world. Three days after monochrom announced their project, for instance, a group in Vienna announced their plans to conduct a MMTW flash mob (monochrom forum).

I offer MMTW as an evocative case of embodied human nodality, a simultaneously regressive (in evolutionary terms) and progressive (in social software terms) move away from language as the primary social cohesive for large-scale communities. This is not to say that verbal interaction and traditional linguistic expression have no place in the supergaming model. To the contrary, they are key to achieving the mutuality, or two-way communication, required by Shirky as the second defining characteristic of community. As this is the model of community that supergaming seeks *massively* to scale, communications-based mutuality is where we will turn our attention next.

EXTERNAL COMMUNICATIONS: THE SUPERGAMING MODEL OF MUTUALITY

The notion that new-media communities require two-way communications networks is not, of course, a new idea. In 1932, Bertolt Brecht famously lamented the failure of what was then a new network technology, the radio, to turn its mass audience into a community, specifically pinpointing its lack of mutuality as the primary problem. In his essay "The Radio as an Apparatus of Communication," Brecht writes, "[R]adio is one-sided when it should be two-. It is purely an apparatus for distribution, for mere sharing out" (51). He then goes on to express precisely the optimistic view that Shirky would reject so persuasively seventy years later, the belief that massively scaled community is achievable through network technologies.

> So here is a positive suggestion: change this apparatus over from distribution to communication. The radio would be the finest possible communication apparatus in public life, a vast network of pipes. That is to say, it

> would be if it knew how to receive as well as to transmit, how to let the listener speak as well as hear, how to bring him into a relationship instead of isolating him. On this principle the radio should step out of the supply business and organize its listeners as suppliers. (51)

More than half a century later, this passage has become one of the most pervasive citations in the works of historically minded new-media artists and researchers, many of whom note that Bertolt Brecht's 1932 critique of radio anticipated the desires of late twentieth-century network technologists to form massively scaled, open communications networks. In 1995, the Critical Art Ensemble famously compared utopian visions of an Internet-fueled, participatory democracy to Brecht's earlier call for a many-to-many civic radio broadcast system. More recently, Brecht's writings on radio provided the epigraph for *Me++: The Cyborg Self and the Networked City*, William J. Mitchell's 2003 ubiquitous-computing manifesto.

As noted earlier, Mitchell's description of a global mobile-communications network, the massively scaled ubiquitous-computing grid, matches the scale of Brecht's vision. But the social interaction Mitchell contemplates is, by and large, made up of private communications that become public only inadvertently, such as when they are hacked. (Paris Hilton's unfortunate experience with her hacked personal digital assistant, for example, certainly demonstrates that ubicomp users of the kind Mitchell describes do not desire their composed digital text messages, photos, or videos to be broadcast – that is to say, to become part of a public, "vast network of pipes.") Although everyday text messages and audio-visual expressions may be composed in public spaces by mobile users, these communications do not have a public or "bringing together" quality of the kind Brecht desires. Perhaps, we should look for an earlier (much earlier) manifestation of Brecht's ideal broadcast system after which to model supergaming's more public and shared approach to a two-way ubicomp-driven communications platform.

Six years after Bertolt Brecht famously decried the failure of radio to turn its audience into producers, Orson Welles infamously demonstrated the potential for radio to serve as a more interactive and public medium. Welles' 1938 adaptation *War of the Worlds*, a fictive news broadcast purporting to report live on an alien invasion of the planet Earth, generated a historic and pervasive spectacle, when thousands of listeners interpreted the live entertainment as real news coverage. According to the next day's lead story in the *New York Times* ("Radio Listeners in Panic"), the radio drama inspired in audience members a real-time response on a massive scale. Thousands left their homes to spread the news and escape disaster, while many more clogged local telecom systems with their interpretations of the broadcast. They turned evening church services into end-of-the-world prayer meetings, fashioned wet towels into protective facemasks (among other remarkable impromptu costumes), and re-purposed street corners into emergency volunteer headquarters. In the process, the *War of the Worlds* airing took on a strikingly public character. Listeners were brought out of the isolation of the private home and into ad hoc relationships with other listeners, public places became the stage for Welles' fiction, and ordinary everyday spaces were infused with live drama. Meanwhile, the primary broadcast medium of the dramatic event switched from a one-way technology (the radio) to a two-way technology – the telephone – enabling a more public and social production.

War of the Worlds' highly reactive listeners, of course, weren't quite the organized creative force Brecht envisioned. Media critic Ken Sanes quite aptly describes them as "oblivious to the fact that they were acting out the role of the panic-stricken public that actually belonged in a radio play." We might, however, consider them *inadvertent* producers, making significant contributions to a theatrical event, even as they believed they were acting in a non-theatrical context. This unintentional dramaturgy is, no doubt, not quite what Brecht had in mind when he called for a "truly public character" for the radio (52). Whereas Brecht desired maximum critical awareness, Welles' listeners were not aware, apparently, of the theatrical nature of what they were doing. However, in all other respects, the communal, connected, and spectacular character of their performed rejoinders seems to me at least to anticipate, if not fully embody, the many-to-many dramatic structure that a multidirectional broadcast technology, as Brecht observed, ought to enable.

The key structural shift to note in this massively interactive, public *War of the Worlds* production is the use of spectacle in public space to recruit a secondary, massively scaled audience. This audience moves the two-way communications beyond the initial community of listeners and serves to receive the primary community's collective expression. To put it another way, instead of insisting that mutuality be interpreted as an internal attribute, *War of the Worlds* demonstrates the scaling of an actively communicating, new-media community where the communications are directed *outward*. This is precisely the model that supergaming adopts, only with an intentionality missing from its historical predecessor.

So consider a slightly altered scenario, in which *War of the Worlds* listeners were fully conscious of the fictive nature of the entire affair. What if, cognizant of the dramatic frame, the audience members then felt compelled en masse to become active players in Welles' production, taking to the streets, rooftops, and switchboards in strategic and self-directed performance? Would we not regard it today as a remarkable demonstration of a collaborative

theatre practice, carried out on a truly epic scale, capable of generating a secondary public audience beyond the initial community of radio listeners? Would it not represent a transformation of isolated listeners into allied suppliers of at least the artistic, if not the civic, dimensions that Brecht desired?

Asking such questions about a 1930s radio drama that did not, in fact, produce any of these hypothesized effects may seem like nothing more than an exercise in revisionist wishful thinking. But in fact, in 2004, the supergaming project *I Love Bees* used the platform of ubiquitous-computing networks and the genre of radio drama to enable precisely the scenario imagined above. Earlier, I described the payphone missions of the alternate reality game; but How did members of the *I Love Bees* community wind up at the phones? and What compelled them to show up in costume, bring props, and call strangers to warn them of invading aliens?

As opposed to the mistaken, pervasive interaction inspired by Welles' *War of the Worlds*, the public spectacle of *I Love Bees* was driven by a conscious decision to play along with a radio drama, broadcast over the Internet and over the payphone network. On 16 July 2004, the *I Love Bees* campaign began with a five-week countdown posted to the Web site www.ilovebees.com. This URL was embedded as a subliminal message in a theatrical trailer for the Xbox video game *Halo 2*; attentive online viewers of the trailer played it in slow-motion and discovered the hidden URL. The frame interpreting www.ilovebees.com thus became the well-known back story for *Halo 2*: a great invasion of Earth by a malevolent horde of aliens known as the Covenant. The countdown on the Web site, then, was interpreted by audiences as a countdown to either the invasion itself or some great disastrous event that would precipitate the invasion. So, when the countdown was joined by a set of GPS coordinates, dates, and times that matched the countdown's "target zero," the audience had weeks to prepare for their public participation in the *Halo 2* story. And for three months after the first payphone rang (over which the first installment of the radio drama played, detailing preparations for the Covenant's invasion), players were able to collect more information through the weekly radio drama updates to further craft their playful payphone spectacles. Eventually, this included assembling two-hundred distributed "band members" to play music over the payphones to keep morale up among the other alien-fighting "armed forces" (read, players), marshalling three trolley-carloads of tourists to hunker down at a single Market Street payphone as evidence of readiness to fight, and getting nearly one-thousand audience members to show up at their closest payphones in alien-fighting costumes that included a VAC suit, full scuba gear, U.S. Army camouflage, medical scrubs, and beekeeper uniforms.

As mentioned earlier, these player-produced spectacles were hugely effective both in attracting international media attention and in creating significant online presence through a network of Web-based photo albums, live journals, blog links, and more. Although the half-million players could not conceivably all communicate with each other, collectively they entertained the larger online audience of two million and the world at large through major media outlets like CNN, *Wired*, and the *New York Times*. These communities were able to communicate outward effectively, in a collective fashion. This, I want to suggest, is the purpose of the spectacle in supergaming: to generate a visible expression that attracts an audience, either local, online, or through traditional media outlets. In this way, two-way communications become a collaborative endeavor, and as such, can be massively scaled effectively.

THEORETICAL DIMENSIONS

I began this essay with a design imperative (More, more, more!), and I proposed that game structures and spectacular aesthetics deployed in public settings are, together, a viable practical strategy for achieving this more, more, more, as well as a provocative intervention in the critical space of network-culture theory. For the most part, my efforts to address these two points have been intentionally performative of their central themes. Ideas have been presented as a network of rhizomatic (and sometime surprising) intersections; I have taken time to linger in the intersections that afforded me the most pleasure; I have attempted to draw together a comparatively scaled-up number of ideas and case studies in the hopes of creating a densely connected network of evidence; and I have been surprised by some of the writing that has emerged. And now I would like to return briefly to monochrom's Massive Multiplayer Thumb-Wrestling (*MTTW*) and my own experience orchestrating their physically co-present and spectacular social networks, to create a final node of analysis for the theoretical intersections that comprise the supergaming construct.

My work with MMTW has consisted of roughly a dozen efforts to turn lecture and workshop audiences into communities (what you might call the reverse Shirky process, in which communities become audiences). I generally ask my audiences to construct the *Kazaa* P2P thumb-wrestling networks, because this is the most familiar network architecture to anyone who has ever downloaded an MP3 or software crack. When engaging these groups, including one of roughly three-hundred game developers re-mobilized as thumb-wrestlers, I have been able to observe firsthand more pleasure, more emergence, and more superpower of supergaming coming into play.

The "more pleasure" is intuitive in this instance – Massively Multiplayer Thumb-Wrestling is a perfect twenty-first century incarnation of the New Games Movement's "the more the better" aesthetic. However, the "more emergence" and the "more superpower" require a bit more explanation.

First, how, precisely, would three-hundred people, asked to form two sets of three-person clusters, arrange themselves? What would this spectacle look like? Who would join hands with whom? and How would they position themselves in space? In connecting circles? Parallel rows connected like a grid? The possibilities for spatial arrangement grow exponentially more numerous as the assembled MMTW community scales upward, and in this way, the MMTW challenge becomes more and more like a fractal geometry problem. Fractals, defined by mathematicians as systems "having similar detail at all scales, leading to intricate patterns and unexpected features," are the quintessential example of emergence ("Complex Systems Glossary"). There is no way to predict the aesthetic complexity of a fractal whose basic geometry or rules set (in this case, a three-player knot) is played out massively multiple times.

In the case of Massive Multiplayer Thumb-Wrestling, the physical resemblance of the enacted rule sets to a fractal geometry problem is actually a visible manifestation of the kind of emergence that occurs in any game structure. In their 2004 *Rules of Play: Game Design Fundamentals*, Katie Salen and Eric Zimmerman write that game design is essentially the design of surprise. They quote Jeremy Campbell's classic text on emergence, *Grammatical Man*, to demonstrate that the phenomenon of emergence is at the heart of all game play: "A modest number of rules applied again and again to a limited collection of objects leads to variety, novelty, and surprise. One can describe all the rules, but not necessarily all the products of the rules" (qtd. in Salen and Zimmerman 158). It is for this reason that ludic structures are so well poised to produce more emergence of massively more; each of the supergaming examples discussed produced results by distributing the same rule set to massively multiple players and observing the "variety, novelty and surprise."

But what about superpower? This aspect of supergaming is inspired by the massively parallel problem-solving network of a supercomputer. And as a collaborative challenge – arrange yourselves so that everyone in the group is connected to four other people through two sets of three-player-knots – MMTW is a fairly complex collaborative problem to solve. It requires significant coordination and concentration and parallel action on the part of the each member of the social network. But to say that the act of constructing the supersized game *is* the demonstration of power-solving capability would be rather circular. Supergaming should require that the network, once assembled, be capable of demonstrating a collective power beyond its own construction. But what is the problem solved by a massively scaled thumb-wrestling war?

Here I turn to network-culture theorist Pierre Levy's notion of "virtualization" as the *articulation of a problematic*. In *Becoming Virtual*, Levy offers an untraditional definition of virtuality: "The virtual, strictly defined, has little relationship to that which is false, illusory or imaginary. The virtual is by no means the opposite of the real. On the contrary, it is a fecund and powerful mode of being, which expands the process of creation, opens up the future" (16).

For Levy, virtuality is not limited to the digital realm of cyberspace – virtuality also exists as a networked mode of thinking and interacting in the material environment. "The virtual is a kind of problematic complex, the knot of tendencies or forces that accompanies a situation, event, object, or entity, and which invokes a process of resolution: actualization" (24). In other words, the virtual is a suggested cause for and *potential* mode of engagement, which tends toward actual action and engagement. *Virtualization*, furthermore, is a "change in identity," so that the virtualized entity "now finds its essential consistency within a problematic field. The virtualization of a given entity consists in determining the general question to which it responds, in mutating the entity in the direction of this question and redefining the initial actuality as the response to a specific question" (Levy 26). This question, once discovered, can then be used as a springboard for further investigation and problem-solving; the virtualized entity may suggest "correspondences" to other entities, correspondences that enable the same question to be used as a primary cause for and mode of engagement, detached from the initial object. It is impossible, once the question is defined, to avoid these correspondences, Levy suggests, and due to this "irreversibility in its effects …virtualization is one of the principal vectors in the creation of reality" (27).

The problem-solving superpower that occurs through supergaming, then, occurs through the ludic virtualization of a site, a mass, or a construct – that is, the redefining through spectacular example of spaces and crowds and everyday systems as new problematic fields. In the case of Massive Multiplayer Thumb-Wrestling, for instance, I would argue that at least three important virtualizations occur. First, ordinary multiplayer games become scaling problematics for those who have participated in the supergame. "How can this game be massively scaled, as we scaled thumb-wrestling?" And, conversely, crowds of people become gaming problematics: "What rule set could I produce to turn this new mass into a massively scaled game, as we scaled the game developers' audience?" And finally, open spaces become invitations for spectacular event design: "What activity could be deployed in this new

space to attract the kind of attention and engage the kind of mass that we experienced through Massive Multiplayer Thumb-Wrestling?"

Indeed, these three virtualizations are precisely how flash mobbing, the kernel of so many of the supergaming experiments to date, spread to so many cities so quickly. The spectacular examples in San Francisco and New York City turned public spaces and activities into problematics – What kind of flash mob could we do in the public spaces we have here? How could we scale the kind of activity we want to do (dancing, singing, playing tag, opening umbrellas) to be appropriate for a flash mob? And so on, in parallel, all over the world, as more and more witnesses learn the flash mob rule set and adopt the role of flash mob designer.

This process of ludic virtualization, which requires both game structure and spectacular examples, is how the supergaming network grows. Technologies, spaces, crowds, and systems become new playgrounds for experimental and collaborative design and interaction, which, once engaged in spectacular fashion, inspire a next wave of parallel supergaming experiments. The massively scaled digital communications infrastructure of ubiquitous computing spreads the rule sets as well as the stories and captured media of the spectacular demonstrations.

And so supergaming as a trend itself scales upward, like the ubiquitous digital network on which it is staged – reaching ever closer to that goal of more, more, massively more.

NOTES

1 Andrew Fluegelman, founding member of the 1970s New Games Movement, on the optimal number of players for their patently oversized and intensely physical games (141).

2 P.W. Anderson, physicist, on the emergence of unpredictable atomic interaction in complex particle systems (373).

3 Pat Miller, computer scientist, on the massive number of Central Processing Units required to construct a do-it-yourself supercomputer (2).

4 The number 150 as a threshold for community decline was made popular by Robin Dunbar's *Grooming, Gossip, and the Evolution of Language*, his landmark 1998 work that argues that the human brain is optimized for keeping track of social relationships in groups of 150 or less. Shirky's socio-mathematical analysis of connectivity in groups of ten thousand or more in his highly influential online essay "Communities, Audiences and Scale" can be credited with setting the higher number as the community "point-of-no-return."

5 To put this benchmark in perspective, a performance speed of 180 Gigaflops per second did not make the Flash Mob I supercomputer eligible for the global Top 500 Supercomputers list on 3 April 2004, for which the cut-off was 400 Gigaflops per second. However, 180 Gigaflops per second was a non-trivial accomplishment; only eighteen months earlier, it would have made the top 500. A history of supercomputer rankings can be found at *Top 500 Supercomputing Sites*.

6 This is a term used extensively by designers in both personal and public forums.

7 The formula for determining potential connections in a group is $(N^2\text{-}N)/2$, where N is the number of members in the group. It scales quadratically, which is to say, pretty impressively: From just under 500,000 potential connections in a group of one thousand, to 12.5 million potential connections in a group of five thousand, to just under 50 million in a member group of ten thousand.

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