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CONTENTS

Urban Futures / Mutable Topologies

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Abstract

Contemplating the status of African cities, curator Okwui Enwezor writes that "cities in their present context are modern inventions, and as the new electronic pathways that crisscross the globe circulate and readapt images of the modern city, they also produce desire for tourism that fuels new contacts and movements within already clogged global travel circuits, unraveling the strict hegemonic tendencies that have always made it difficult to read the map of spatial difference." (Enwezor 2002) These sprawling conurbations in all corners of the African continent, like their sister cities in Asia and Latin America, challenge long held dictums about urban processes, infrastructures, and the buildings that define European and American canons on modern urbanism—"unraveling," as Enwezor astutely observes, "strict hegemonic tendencies." (Enwezor 2002) The urbanization of the African continent will soon create the largest megacities in world— Cairo in the North, Lagos in the West, Nairobi in the East, and Johannesburg in the South. In our research, the term "city" brackets the spatial boundaries of these urban agglomerations that exceed local, regional and through their diasporas—national boundaries. Official reports and popular media represent African cities "as chaotic and disorderly, and," according to Enwezor, are "therefore always outside the category of order and modern urban planning and procedures of rational spatial organization." (Enwezor 2002; Ferguson 2006; Murray 2006; Scott 1999) Social scientists, planners, architects and policy makers impose the binaries—order/disorderly and formal/ informal—onto the spatial dynamics of African cities to make sense of their urbanism. However does the binary "first world/third world" make sense when some of the fastest growing markets in mobile and cloud computing are emerging in cities around the African continent; cities for whom technology companies are developing new products—ones subsequently marketed elsewhere in the world? (Andjelkovic 2010; Archambault 2012; Larkin 2008) Global Africa Lab's research outlined in this paper asks what new methods, such as parametric modeling and data visualization, are necessary to understand the dynamic urbanism these cities present and to "read the map of spatial difference?" What conceptual frameworks of architecture and urbanism do we need in order to study how data, images, people and products circulate via their virtual and physical networks? What can we learn from how these vectors of communication and social media cut through urban boundaries and spatio-temporal discontinuities to conjure a "space of flows?" At the global scale, this space of flows beginning in the early 1990's gave rise to expansive networks that linked cities and crowned global capitals. One outcome of globalization is that cities around the world became organized hierarchically according to their dominance in advanced services, producer centers and markets. Under these conditions, architecture developed an infrastructural relationship to the making of cities and urbanism became not limited to urban infrastructure but inclusive of spatial and social relationships. From our various studies, we argue that the topology of this new model of urbanism, which is an outcome of a variety of spatial processes in flux, does not upend the African city but rather it provides a reflexive lens through which to critique such flows along with

the power structures, political systems, heterogeneities, and social inequalities embedded in these urban morphologies. It offers a prospect from where architects can speculate on the future of African cities.

Johannesburg, South Africa occupies a geo-location in the space of flows that until near the end of the twentieth century was a place social disjunction, political denial, cultural suppression and global boycott. Modern Johannesburg began as a colonial hub that Dutch colonists built upon the Highveld's frozen rivers of gold, platinum and diamonds, out whose extraction flowed a river of blood and anguish. The formation of the colony, which eventually became a commonwealth and eventually a nation-state, was predicated on the racial segregation and oppression the majority black and "colored" populations. Architect and theorist Lindsay Bremner cogently argues that the state sanctioned and violently enforced system of racial Apartheid "brought together the discursive networks of government, urban planning, public health and urban administration.... Modern town planning principles meant to maintain racial separation were overlaid on the geography and natural features of Gauteng together with the location of industrial zones and vacant lands used to create a spatially discontinuous city and to buffer black from white, rich from poor, urban from suburban and urban from township settlements." (Bremner 1998) Under government direction that employed the knowledge of well-trained experts, Apartheid was planned and executed to shape the nation's landscapes and cities. The fortressed modernist commercial and residential towers of the Central Business District, like Skidmore, Owings and Merrill's Carlton Center (1967-74), attest to the wealth generated under such harsh geo-spatial policies of racial oppression and social control. Apartheid's planned racial segregation that deliberately separated the "white city" from the rural "black townships" has become the substrate for today's Post-Apartheid Johannesburg to emerge as a neoliberal hub of global capital and culture. (Mbembe 2002; Murray 2011)

Post-Apartheid Johannesburg's current urban and architectural organization, typical of the disjunctive spaces of many global cities, produces pockets of wealth, so-called formal sectors, that are surrounded by wide swathes of informal dwelling and commerce, with much of the historic racial and economic segregation still intact. In Johannesburg, liberated human ecologies informed by technology, information, globalization and new kinds of flows confront this landscape of gated suburban enclaves, office compounds, fenced in malls, sprawling slums, mine dumps, and abandoned high-rises to create chimera-like topologies. This new topology is punctuated by what we label as "synapses" that shear time from space and shear acceleration from evolution. (Sola-Morales Rubio 1995) These synapses exhibit the capacity of rapid adaptation—across the ground and by way of vertical, and horizontal thresholds of urbanization. Evidence of these synaptic clefts is demonstrated by South Africa's high mobile phone penetration rate—one of the highest in the world at 105% with 51.6 million subscribers. (Africa 2011) Furthermore, 60% of cell phones are WAP (wireless application protocol) enabled that allows 27% of rural users access to the internet through their mobile phones. Eighteen percent of South Africa's nearly 52 million cell phones are smart phone users; overall that equates to a market of 9.5-million consumers. (The Media 2012) Taking advantage of this access, new services such as WIZZIT have been established that utilize the internet and cellphones for banking that taps unbanked and underbanked markets. (Andjelkovic 2010) This statistic of mobile phone penetration proves staggering given that areas of many slum settlements lack landlines and adequate electric power service. While Johannesburg's residents may be connecting in new ways across the city, from Soweto to Sandton, via these new mobile technologies, their connectivity may be interrupted at any moment by intermittent electrical blackouts due to requisite load shedding of an overwhelmed electrical grid.

Left in the wake of Apartheid's decades long turbulent vortex, Johannesburg's urban topology reveals a place of extreme disparities, contradictions, and contested terrains that formulate these synaptic clefts within the city's rapid adaptation to globalization and a networked society. Further evidence of these synaptic clefts in the physical networks of the city can be found walking the sidewalks of downtown Johannesburg—the Central Business District—whose byways are cluttered with all manner of exchanges and people making their own way in the economy of mobile phone repair and as phone card and SIM card vendors. (Figure 1) Nearby in the heavily trafficked vertical malls, locals and immigrants patronize the shops of Zimbabwean hairdressers and Angolan tailors that are wedged between internet cafes and Ethiopian coffee shops. On the busy streets of Bree and Jeppe, vendors hawk everything imaginable manufactured in China, India, and the Middle East. Hence, this synaptic topography is defined by a paradox of spatio-socio-temporal sites ruled simultaneously by exuberance, dynamism and improvisation on the one hand, and baseness and obsolescence on the other (the legacies of colonialism, post-colonization, crisis, Apartheid—and now globalization.) (Bremner 2012; Matsipa 2011; Nutall 2008) Examining this emergent urbanism, our research asks how do mobile technologies—by tethering formerly separated locales—allow the multitude (citizens, immigrants, tourists) to craft new spatial and temporal landscapes, spaces latent with agency? Aided by mobile technologies forging new linkages and networks, how might a re-territorialization of Johannesburg's divided urban expanse be occurring?

(Figure 1)

To examine this context, we organized graduate architectural design studios that used advanced computational methods and parametric modeling to research, analyze, and translate the space of flows and topological conditions of Johannesburg's emergent urbanism. (Meredith 2008) The studios asked if architecture is a form of knowledge, the materialization of concepts, then how can we conceive architecture in Johannesburg's spaces of disjunction? Can computational methods and advanced digital modeling enable us to decipher the complexities, transformations, and new types of relations and exchanges, development and subsistence, forms of solidarity and resistance being produced as the South African city adapts to the global restructuring of urban life?

In Global Africa Lab's studio for Spring 2012, titled Parametri-Cities: Synapse(i)s, students mined data by using the software Rhino, in conjunction with the parametric modeling plug-in Grasshopper. They learned these techniques in workshops taught by our GAL researcher Carson Smuts. This offered students the possibility to explore parametric and computational design with unprecedented fluidity. Leveraging this capacity, the studio uncovered new strategies for design from the adaptive responses of human ecologies (informed by natural and environmental systems). By using parametric modeling students researched and mapped the visible and invisible pre-liberation and Post-Apartheid networks and flows of this cultural landscape. The preliminary research mapped the networks of capital, labor, information, raw materials, technology, knowledge, human infrastructure, transportation, and trade. The research also engaged the new types of relations and exchanges via mobile phone usage (SMS, transactions, exchanges, etc.) and time-sharing social practices, social media, and social networks (SMS, BBM, Twitter®, MXit, etc.) These new networks collapse virtual topology upon urban topography in order to allow for improvisation, adaptive responses, and the bridging of synaptic clefts to create an increasingly complex heterogeneous and mutable landscape. The analysis by students of a particular flow (sub-sites) within this context entailed not only specifying the numerical values and mathematical relationships, but also uncovering the embedded cultural and social values of the human ecologies of Johannesburg. Research, for example, revealed that while electrical utility customers in impoverished and underserved electrical service areas such as Kliptown or Diepsloot (both in Soweto) can purchase prepaid electricity using a payment app called "Swap Wallet" on their mobile phones, these residents, whose per capita income is only one-third the income of rich white residents in the northern suburb of Sandton, pay nearly double per kilo-watt hour for electricity than their neighbors in the north. Moreover, in 2008 the South African electrical utility company (Eskom) introduced "load-shedding"—periods of planned rolling blackouts on a rotating schedule. (Figure 2) A geo-spatial analysis of the load-shedding schedule for 2011 revealed in one student's research that black, impoverished settlements were the most adversely affected the areas of Johannesburg. Based upon the topological conditions of these temporal and spatial disparities and disjunctions, the student investigated the ways in which new programs for collective events and even domestic rituals could be reconceptualized. The student's proposal for an energy harvesting and distribution facility at Walter Sisulu Square in Kliptown is cross-programmed as a public "living room" that proposed collective food preparation, dining, and public health services.
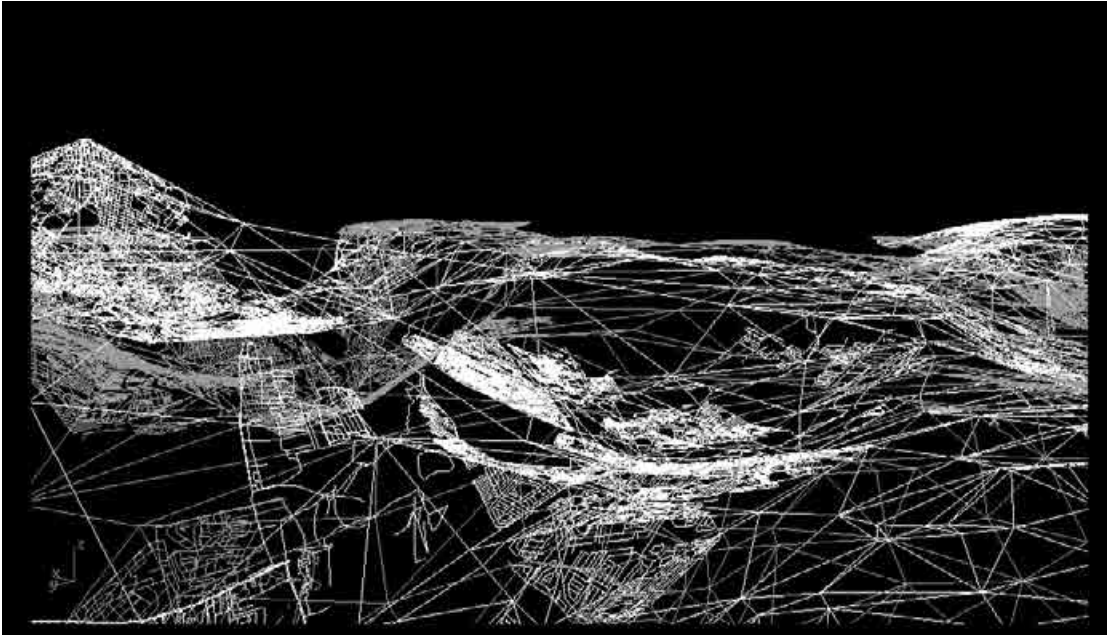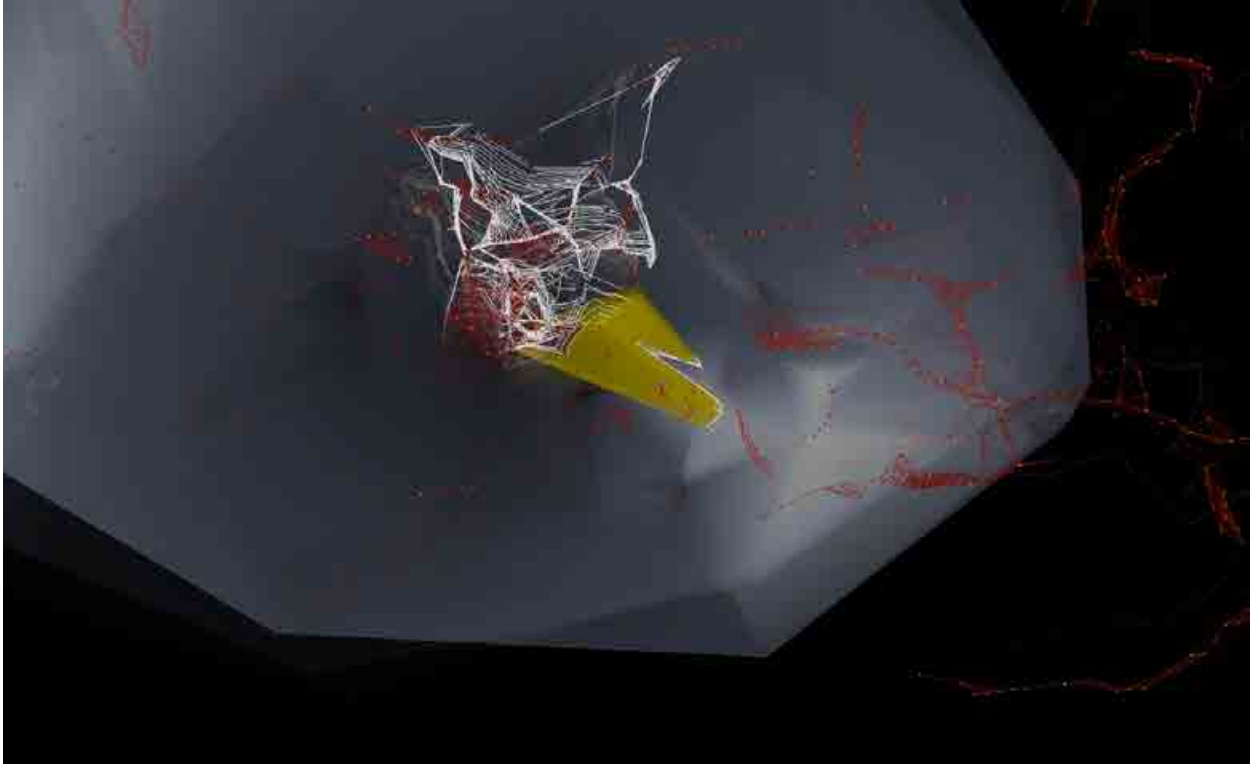
(Figure 2)

Using live traffic data provided by the City of Johannesburg as well as real-time data Google Maps® traffic and Twitter® another student in the Parametri-Cities: Synapse(i)s studio, set out to test the durability of Johannesburg's sprawling Apartheid era transportation network upon the commuting time of residents. While Johannesburg's Metrorail system was developed primarily to transport black workers to the gold mines, planners intentionally did not to provide access to wealthy white areas in the north. The geo-politics of the informal taxi system is problematized not only by limited access points and routes, but also by crime and mobster-like territoriality. Amid this uneven transportation system, the student's experiment posed the following mathematical question:

> 6.30 am: Two people travel from their home in Soweto to Sandton. One commuter uses the C1 Rea Vaya route until Park Station and then transfers to a metered taxi. The other takes the train from the closest Metrorail stop to Park Station and then he transfers to a metered taxi as well. How long does it take each commuter to reach his or her destination and what is the perception of space in each case?

The student developed a script to translate the live data into a time-based map along the travel routes that was then mapped onto the topography of Johannesburg. (Figure 3) The resulting model demonstrated the disparities, traffic delays, and loss of valuable time of each commuter. It also documented spatial perceptions yielding a topology of folded, warped, bent, blended, stretched, creamed, and re-folded space-time. The student's proposal for a chapel in downtown Johannesburg was a critique of movement, mobility, and a transportation network that had been designed to control labor and segregate residents according to race. (Figure 4) The new chapel would vertically and visually reconnect the disconnected places of the horizontal transportation network. Inside, visitors would encounter a container of urban sounds, hear voices against the political situation and convert events into moments of protest.
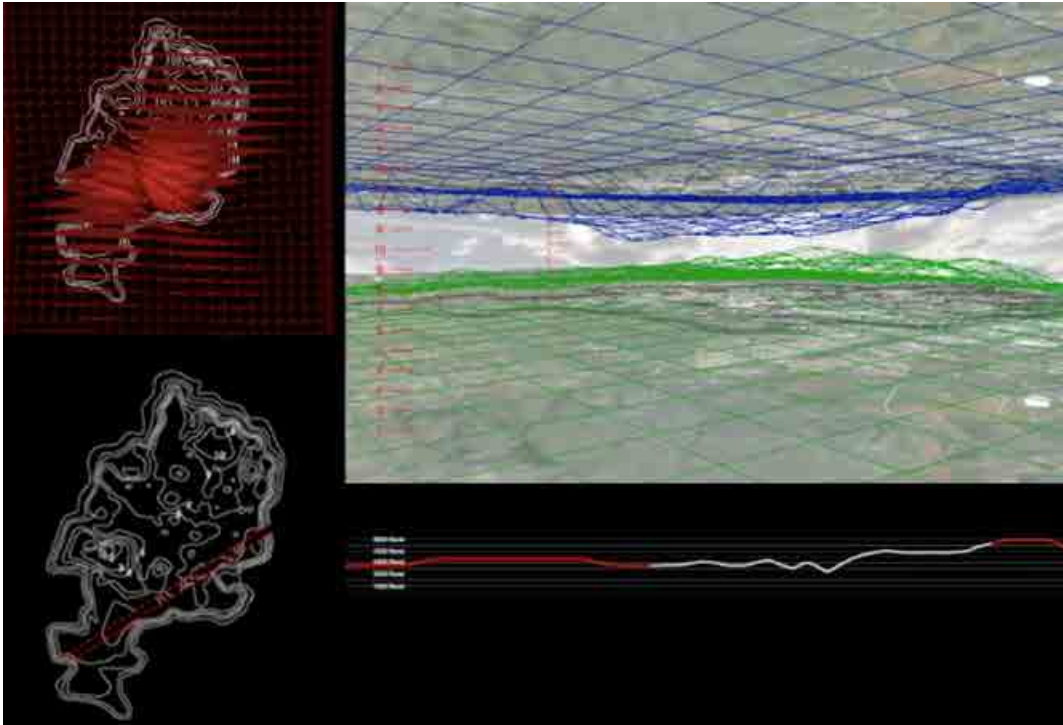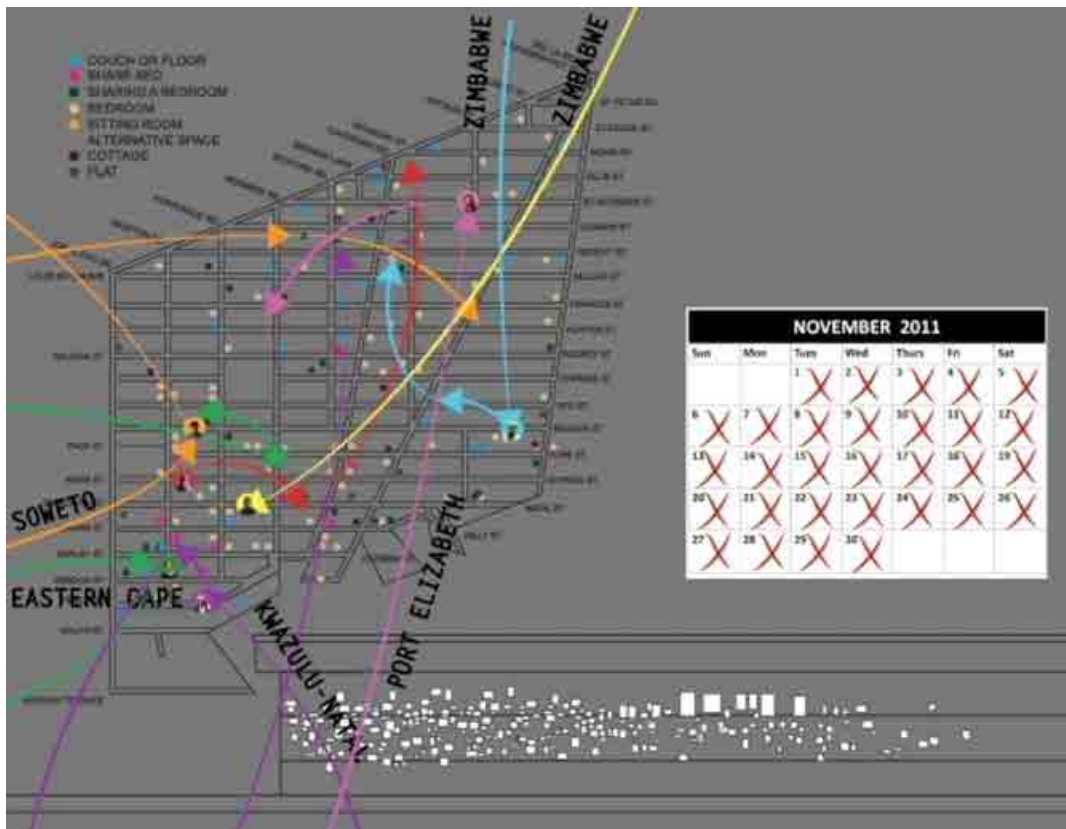
(Figure 3)

(Figure 4)

For our GAL studio in Fall 2012, titled Media/Memory/Multitude, students researched and topologically mapped the physical, virtual and social networks of Johannesburg's various neighborhoods including the ubiquitous mine dumps that define the city's terrain. Paired in teams, they analyzed Johannesburg's "media-scape"—the city's networks of mobile telecommunications, social media, telecommunications, and surveillance. They also studied the urban "landscape"—the city's infrastructural networks of transportation, utilities, migration, finance, mining and tourism. Using the same techniques of data mining and parametric modeling deployed in the previous spring studio, students probed the public database of official statistics—StatsOnline—maintained by the South African government. And like the previous semester, they accessed open-source real time data feeds from Twitter, Facebook, MixIT, Flickr, Four Square, or other reliable sources. Using Rhino, Grasshopper, and custom scripts to parse given and gathered data sets, students topologically mapped the transformation of these networks over time to show appearances, disappearances, shifts, drifts, and mutations in the urban topology. Students constructed a model that combined data visualized in their "mediascape" and "landscape" studies to delineate a "chronoscape"—a new space-time model of Johannesburg.

In the Media/Memory/Multitude studio, one team's space-time analysis of tweets about the recent Marikana mine massacre, for example, demonstrated how quickly social media compresses to mere seconds the movement of information across a vast landscape that separates a remote platinum mine from a global hub like New York City. By overlaying census data indicating levels of education and literacy onto geo-tags of tweets, they also discovered in their topological "chronoscape" how virtual connectivity is still nonetheless limited in part by systemic social and economic inequalities. (Figure 5) Another team studied how the pre-liberation government's stringent censorship and control of television and radio—SABC—had stymied growth in the broadcast industry that still impacts access to media in today's South Africa. By analyzing data on the type of programming that the main television network SABC presented in English (75%), Afrikaans (9%), Zulu (7%) and other languages, they developed a chronoscape model that demonstrated how SABC fails to address the viewing needs of a diverse audience that speaks over 20 languages. For their project site, this team studied the spatial range of a densely papered message wall that hosts postings written in the many languages of the immigrants who dwell in Yeoville. (Figure 6) As an example of a synaptic cleft in the urban flows of information, this block long message wall has resisted being digitized precisely because it operates as multilingual and multi-use public space of exchange—the wall has spawned, for example, related businesses including movers who park their pickup trucks nearby. Learning from this analogue example of "local-casting," students conceived of a mobile broadcast unit—BYOB: Bring Your Own Broadcast—that would be locally controlled and whose content could be broadcast throughout the new network. (Figure 7) As a virtual and urban node of connectivity, when parked on the street or in a park, BYOB's solar panels would also provide electricity for patrons and nearby street vendors.

To conclude, we consider Johannesburg's patchwork of emergent systems as "new collective networks of expression" (to borrow Antonio Negro and Michael Hardt's phrase) that challenge the spatial difference wrought by decades of oppression. (Hardt 2004) "New collective networks of expression," for example, formed the social media networks that proved fundamental to knitting together the local coalitions and global supporters of the Arab Spring (or as some have astutely pointed out that because it started in northern part of the continent—in Tunisia, Libya and Egypt—the most powerful and poignant revolution of the twenty first century should be labeled the African Spring). That both space and time are being transformed under the combined effect of the
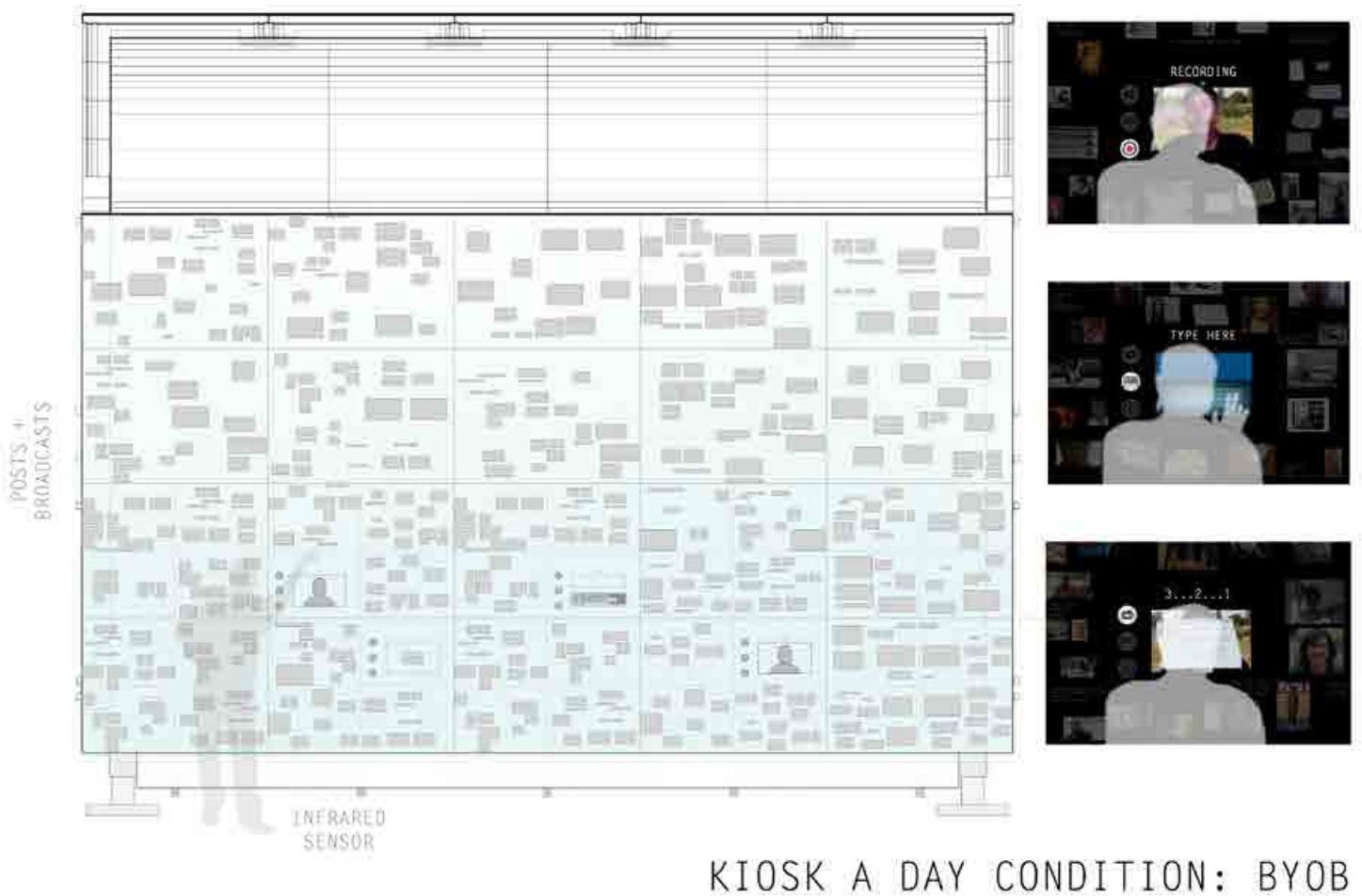
(Figure 5)

(Figure 6)

information technology and by social forms and processes induced by the currents of historical change is an obvious and hardly a new concept. (Appadurai 1998; Castells 1989; Galloway 2004) However, while the information age was thought to have produced a space-time distanciation that resulted in a tearing of space-time from place leading to a decline in personal human interaction as well as a decline of dense urban conditions, mobile technology and social media are in fact producing a collapse of space-time and place through time-sharing social practices that are not only transforming the traditional city of the well-worn "first-world/third-world" binary, but also transforming way that the problematics of the African city are re-conceptualized. (Giddens 1990) "New collective networks of expression" also characterizes processes through which new social and cultural communities form and new political structures emerge. These processes also produce spatial relationships over time that in turn will create "new collective spaces of expression."

(Figure 7)

References

Africa and the Middle East: Telecom-Week, Table 1: South Africa – Important Economic Parameters. (2011). In African Telecom News, Craven Arms, UK: Blycroft Publishing. africantelecomsnews.com/resources/AfricaOpp_South_Africa.shtml. Access April 7, 2013.

Andjelkovic, M. (2010). The Future is Mobile: Why Developing Country Entrepreneurs Can Drive Internet Innovation. In SAIS Review 30, no. 2: 121-133. Baltimore: John Hopkins Press.

Archambault J. S. (2012). Travelling while sitting down: Mobile phones, mobility and the communication landscape in Inhambane, Mozambique. In Africa: The Journal of the International African Institute 82, no. 3: 393-412. Cambridge: Cambridge University Press.

Appadurai, A. (1998). Modernity at Large. Minneapolis: University of Minnesota Press.

Bremner, L. (1998). Crime and the Emerging Landscape of Post-Apartheid Johannesburg. In Blank-Architecture, Apartheid and After, edited by H. Judin and I. Vladislavić. Rotterdam: NAi; New York: Distributor, D.A.P./Distributed Art Publishers.

Bremner, L. (2010). Writing the City into Being : Essays on Johannesburg, 1998-2008, edited by B. Law-Viljoen. Johannesburg: Fourthwall Books.

Castells, M. (1989). The Informational City : Information Technology, Economic Restructuring, and the Urban-Regional Process. Oxford, UK ; New York, NY, USA: B. Blackwell.

Don't Underestimate Mobile Platform. (June 12, 2012). In The Media Online, Affiliate to The Media Magazine, Park Town, South Africa: Wag the Dog Publishers. http://themediaonline.co.za/2012/06/briefly-dont-underestimate-mobile-platform/. Access April 6, 2013.

Enwezor, O. (2002). Introduction. In Under Siege: Four African Cities Freetown, Johannesburg, Kinshasa, Lagos Documenta 11 Platform 4, edited by O. Enwezor, C. Basualdo, U. M. Bauer, S. Ghez, S. Maharaj, M. Nash and O. Zaya, 13-20. Ostfildern-Ruit: Hatje Cantz; New York: Distributor, D.A.P./Distributed Art Publishers.

Giddens, Anthony. (1990) The Consequences of Modernity. Stanford: Standford University Press.

Ferguson, J. (2006). Global Shadows: Africa in the Neoliberal World Order. Durham [N.C.]: Duke University Press.

Galloway, A. (2004). Protocol: How Control Exists After Decentralization. Cambridge: MIT Press.

Hardt, M. and A. Negri. (2004). Multitude : War and Democracy in the Age of Empire. New York: Penguin Press.

Hayles, N. Katherine. (1999). How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics. Chicago, Ill.: University of Chicago Press.

Judin, H. and I. Vladislavić. (1998). Blank-Architecture, Apartheid and After. Rotterdam: NAi; New York: Distributor, D.A.P./Distributed Art Publishers.

Larkin, B. (2008). Signal and Noise: Media, Infrastructure, and Urban Culture in Nigeria. Durham: Duke University Press.

Matsipa, M. Urban Mythologies. (2011). In Fire Walker, edited W. Kentridge and G. Marx. Johannesburg: Fourthwall Books.

Mbembe, A. (2002). On the Postcolony. Berkeley: University of California Press.

Meredith, M. (2008) From Control to Design: Parametric/Algorithmic Architecture. New York: Actar.

Murray, M. J. (2006). Cities in Contemporary Africa, edited by M. J. Murray and G. Mayers. New York: Palgrave MacMillan.

Murray, M. J. (2011). Cities of Extremes: The Spatial Politics of Johnanesburg. Durham: Duke University Press.

Nuttall, S., J. A. Mbembé, A. Appadurai, and C. Breckenridge. (2008). Johannesburg: The Elusive Metropolis. Durham: Duke University Press.

Scott, J. C. (1999) Seeing like a state: how certain schemes to improve the human condition have failed. New Haven: Yale University Press.

Sola-Morales Rubio, I. (1995). Terrain Vague. In Anyplace. Cambridge, MA: MIT Press.

Captions

Figure 1. CBD, Downtown Johannesburg near Park Station.

Figure 2. Animation still of Load-Shedding Geo-Spatial Analysis; Gustavo E. Bonet; Columbia University GSAPP, May 2012.

Figure 3. Animation still of Transportation "Delayed Topography"; Aikaterini Petrou; Columbia University GSAPP, May 2012.

Figure 4. Chapel Library of Delayed Topography; Aikaterini Petrou; Columbia University GSAPP, May 2012.

Figure 5. Animation still of "chronoscape" mapping an income landscape, education landscape, and social media across Johannesburg; Khan Sibley and Pablo Fernandez-Villaverde, October 2012.

Figure 6. Animation still of "chronoscape" mapping the movement of immigrants to and around Yeoville. Tanya Gershon and Matt Wang, December 2012.

Figure 7. Bring Your Own Broadcast – BYOB; Tanya Gershon and Matt Wang, December 2012.

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