Prof. Mario Gooden, Prof. of Practice
Co-director, Global Africa Lab
Carson Smuts, Assistant Professor Adjunct
Mokena Makeka, Assistant Professor Adjunct

Image Cities Circus

[Mobility and Technology in the "World Class African City"]

> The city is no longer one entity, but one in a chain of many, and all the distances in between. This has immense consequenes for architecture and how it imagines the city and its urban futures… A migratory architecture or rather an architecture for these migratory times, would require that architecural intelligence imagine the city not as a morphological, material arrangement of inside and outside, public and private, but as a thicket of circuits and routes, of delays and vast expanses of space between, of several places simultaneously. It would follow, track, record and map these often-invsible flows and then put them to work to imagine and make the city differently.
>
> Lindsay Bremner, *"Imagining the City", Writing the City Into Being 1998 - 2008*

l:*Craftsmans Ship*, Maboneng Precinct, Johannesburg. Stephen Hobbs (Artist); r. Global Flight Path Map

Condition 1

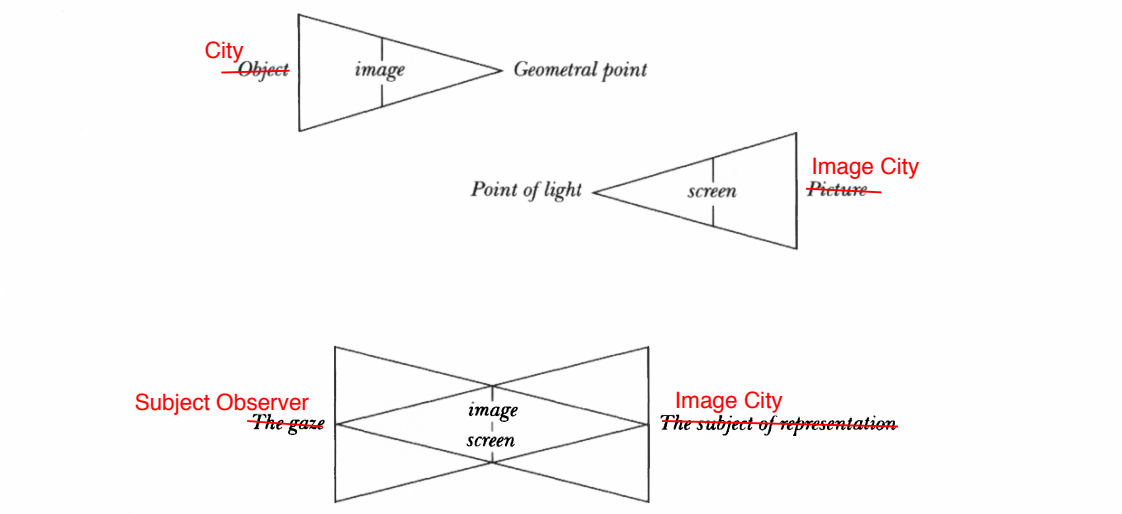
In the age of globalization the image of the City exists in the imaginary of its media images proliferated by the Internet, global media conglomerates, and social media. Moreover, the influences of globalization operate not only upon urban economic restructuring but also upon the symbolic production of the city image. In line with globalization and urban entrepreneurialism, the meanings of cultural elements are produced and circulated to symbolically represent values and the identity of the city itself. No longer is the image of the city defined by its environment --- its physical systems, ecologies, and constructed settings for activities and events. But rather, the image of the city is defined by its "image dimension"[1] and its ability to construct itself as a brand in order to seek international attention and to market itself to global investment. The image dimension is neither spatial nor experiential but it is predicated upon the aesthetic aspect of a symbolic representation of the city that flows within the global streams of information, media, and data.

[1] See the World Bank's definition of City Brand. http://documents.worldbank.org/curated/en/2012/12/18257092/city-brand

In the history of cities prior to twentieth century globalism, the image of the city was defined by the image of the environment --- the experience of walking in the city and the perception of moving elements; the structure and legibility of the city defined by urban morphologies, recurring relationships and archetypes, scale, time and complexity; and its imageability defined by the reciprocal relationships between observer and the city that enabled the observer to construct his identity and meaning based upon experience, memory and culture.

The physical environment and its imageabilty were thought to be the consequence of the architecture of the city's monuments, the nature of its public spaces, its infrastructure, the expressionisms of technology evidenced in its fortifications, bridges, and evolutionary building tectonics, and what the city manufactured --- i.e. its cultural production. In the age of globalization, cultural production is superseded by image production and media consumption. Image production fabricates cultural production within the milieu of symbolic representations that flatten meaning and reduce complexities to simplistic icons.

That Johannesburg has re-branded itself as "A World Class African City" signifies the international attention the city received in recent years and the expected global investments as the igniting forces of globalization transition from China and Southeast Asia, to Brazil and South America, and now to the African continent.



[2]

Yet, Johannesburg (Lat: -26.20423 Lon:28.04685) is a city in the space of flows that until near the end of the twentieth century was a place of political and cultural disjunction, denial, suppression and --- global boycott. Johannesburg's Post-Apartheid landscape (pop. 3.6 - 4.5 million) is a space of extreme disparities, contradictions, and contested terrains formulating the synaptic clefts within the city's rapid adaptation to post-Apartheid globalization and the "space of flows" of a networked society. Potent

[2] See discussion of subject / object relationships developed in neo-conceptual photography with regards to Lacan's Mirror Stage in Foster, Hal. "Obscene, Abject, Traumatic." *October.* Vol. 78 (Autumn, 1996), pp. 106-124.

evidence of these clefts are demonstrated by the fact that South Africa has the highest mobile phone penetration rate in the world having broken the 100% barrier in 2008 and a total market reach of 44.5 million customers. This statistic exists despite the fact that broad areas of many settlements (formerly townships) and other areas lack landlines, adequate electric power service, water supply and sewer service.

The heterogeneous context of sets of relations and converging territories of present day Johannesburg is informed by the legacy of racial separation that was used by the government to promote physical order, health, social stability and control. In "Crime and the Emerging Landscape of Post-Apartheid Johannesburg", Lindsay Bremner states that this system "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.

The irony of liberation in Johannesburg is the once unoccupied public spaces --- parks and open spaces --- are now being occupied those who have fled the townships, migrants from the countryside, and immigrants from SADC (Southern African Development Community) countries seeking a promise of a better life. In this condition, liberated human ecologies informed by technology, information, globalization and new kinds of flows confront the contested landscape to create chimera-like topologies and rapid responses to social, cultural, political, and environmental situations.

Hence, what is the city image that is globally projected and reflected back to itself and how is this condition inclusive as it is exclusive? What are the contradistinctions, phatasms, and surrealities of these simultaneities? What is the potential for the virtual network overlay of the city's "image dimension" and its physical construct to result in a programmatic sleights-of-hand that give way to performance, event, disruption, and critique?

For architecture and urban redevelopment maintain their abilities to render complexities and multi-layered meanings within this reflexive and topological condition and to give agency to the diverse identities of this landscape is the opportunity to reconstruct a city of cultural production that will supersede its image.

Condition 2

The studio will use advanced computational methods and parametric modeling to research, analyze, and translate the reflexive flows and topological conditions image city Johannesburg. The preliminary research will engage the new types of relations and exchanges via time-sharing social practices, social media, and social networks that collapse virtual topology upon urban topography and physical construct in order to allow for adaptive responsesto create an increasingly complex heterogeneous and mutable landscape.

Data mining tools and parametric modelling research methods will be introduced in a series of workshops during the first four weeks of the studio. These topological methods developed in Rhino with Grasshopper* will allow the viritual network overlay of the city's image dimension be studied in magnitude from the global (macro) to the local (meso) to the site (micro). The studio will rely on tracking flows of

information and migratory flows of trade in social media feeds, census tracking, and other relevant resources.

Condition 3

The studio will design a project for a migratory architecture --- Circus--- in the city of Johannesburg. The history of the modern circus dates to the 18th century and the early circus included extraordinary displays of nature and performance in permanent structures intended for amusement and distraction during the Industrial Revolution in England and Belle Epoque in Paris (1871 – 1914). The modern circus later developed as a series of itinerant events and performances that include the fanciful as well as the phatasmagoric. The circus and circus performers provided a distraction from and disruption to the *everyday life* of the modern city where by sleight-of-hand and contortion created a dual reality within the space of performance. Shortly following the Russian revolution in 1917, Lenin nationalized the Russian circuses in order to become "the people's art form" --- egalitarian regardless of class, education, language or race.

TRAVEL

The studio will travel to Johannesburg and Cape Town, South Africa from March 9 through March 15, 2015 for fieldwork and site reconnaissance and to visit Studio-X Johannesburg. The studio will have a mid-term review at Studio X in conjunction with a series of Studio-X launch events. International students should confirm travel and visa requirements as soon as possible.

WORKSHOP

A series of in studio workshops will be conducted during the first part of the course to introduce advanced computational tools and to refine parametric techniques using scripting, Rhino® and Grasshopper®. These workshops will be in coordination with the preliminary research section of the studio. The digital tools are here intended as an interactive mapping exercise that creates relationships between sets of data and information. The wide availability of data on different platforms makes a wide choice of sets of data available. The representation of the image city's virtual netwwork overlay and its physical construct will be used to reveal analogies and synchronisms. More than an end in itself, new iterations of the network and its representation will serve as a base to keep exploring, both for the student alone and with others by serving as a tool for provocation and response. The goal of the workshops and the research is three-fold: 1.) to make the invisible visible; 2.) to evidence the counter-intuitive, and 3.) to assert the conjunctive relationships […and therefore] between hypothesis, experiment and conclusion.

These digital tools provide an interactive mapping exercise that creates geometric relationships between sets of data and information. The wide availability of data on different platforms makes a wide choice of sets of data available, so it is important to find sets of data about the topics that fit into the following KEY criteria:

- ⊗ search for topics of inquiry that are quantifiable into data sets
- ⊗ select data sets that can be spatially or geographically located
- ⊗ select data sets that show change over time

The representation of these networks through data visualization and spatialization will be used to reveal continuities of global flows and discontinuities caused by ruptures/stoppages/redirections. The identification of new iterations of networks and the resulting representations of those networks will become vehicles for exploring the studio's theme and context. By visualizing hidden relationships and dynamics, this method of investigation will be useful over the course of the semester as the students as they develop their projects. The goal of the workshops and the research is three-fold: one, to make the invisible visible; two, to evidence the counter-intuitive, and three, to assert the conjunctive relationships between hypothesis, experiment, and conclusion.

Workshop program
Over the course of the first four weeks, students will learn how to research archival and live data through various platforms and data sources. This method of research—Data Spatialization—will show students how to access geometry through digital means. Understanding geometry as data is key to utilizing the information discovered through research phase of the design process. Conditional statements will be introduced and are important when comparing and sorting through our data sets. This will lead to understanding how mathematics is key to formulating the logic necessary to fully articulate and represent your hypothesis.

We will be utilizing census data as well as open source API's (Application Programming Interface) over the course of this semester in order to gain access to streaming social media and other data sources. An API is an interface between two software packages that facilitates their interaction. These interfaces consist of a set of rules and codes that allow various software platforms to communicate with each other. The purpose of the workshops is for students to gain an understanding of the workings behind these interfaces.

The studio will also introduce a live component to how data is collect so that we may use live feeds from social media platforms like Twitter® and Google Maps®. We will also use of Processing and custom components to gather streaming data from open source databases. Students should not be worried about learning how to program, templates and help will be provided. It is more important for students to explore and discover the potential of data so that it may be used productively in conjunction with Topological modeling, which presents of geometry as data.

Tutorials
Students are expected to complete a series of on-line tutorials that complement the workshop sessions. These tutorials have assignments that need to be completed as part of the studio's coursework.

Before the first week's tutorial, the following on-line tutorials and primers must be reviewed. Download and read Andy Payne, Grasshopper Primer: http://www.liftarchitects.com/journal/2009/3/25/the-grasshopper-primer-second- edition.html Grasshopper Primer mandatory Chapters:

1 Getting Started
2 The Interface
3 Grasshopper Objects
4 Persistent Data Management
6 Data Stream Matching
8.1 Lists & Data Management
9 Vector Basics

Essential Mathematics for Computational Design is not required to review, but it is highly recommended: http://download.rhino3d.com/en/Rhino/4.0/EssentialMathematicsSecondEdition/

Week 01 – What are Algorithms? How is Data Sketched?
The first workshop's tutorial reviews step-by-step the advanced principles at the core of parametrics and algorithmic computation. Advanced experimentation and exploration can be achieved quite easily as long as students know the foundations of any given piece of software. This tutorial starts with the core knowledge and works its way out to more complex tasks. The fundamentals surrounding this core knowledge are the use of arrays, lists or tables of raw data, coupled with mathematics. This tutorial will provide a deeper understanding of the architectural potential embedded in the framework of this software and the potential of mathematical operations that can be performed on this data. This tutorial will demonstrate:

⊗ how a something is quantified into data
⊗ how to mine the data for targeted information

⊗ how that new data is spatialized ⊗ how spatialized data is then geometrically mapped in space (scaled and given form)
⊗ how that data changes over time through the introduction of animation.

Week 02 – What are Data Sources and API's ? What are different examples of data sources?
Data sources can be dense as well as dynamic in terms of how it can reveal differences. Therefore it is important to know how to sort through and pinpoint relevant information that is useful in the research. This tutorial examines step-by-step an example of how to mine a data source and how to chart the data via the use of Excel. It will show how to cull data from external sources and how to save the data into .xml format. It will also demonstrate how to import that information into different programs.

This tutorial will also review of specific examples of data visualizations that utilize objects, arrays, and functions. We will also examine the correlation between data that has been gathered and how it gets visualized. This tutorial will consider how to utilize various media sources: Twitter®, Pachube, NYT, Facebook®, Flickr®, LastFM®, Pandora®, MXiT®, Google Weather, Yahoo® and other sources; Examples of mashups - Just Landed

Path and List Management and Custom Components
Data can be overwhelming when data sets expand into thousands and thousands of lines of information. Management of a list is critical in order to setup your definitions. Understanding how to match data structures will be important when working in with your research. The concept of clusters and groups will be introduced in order to simplify the sharing of definitions and data in the team.

Week 03 – How do you operate between Rhino® + Grasshopper® + more?
As tool for modeling, Rhino is the spatial field across which the data minded in Grasshopper has been distributed. Precise measurements correlated to the mined data are important for how data is geometricized and located in space. This is why it is critical to find data sources that are geo-tagged or correlated to a map or plan. Rhino and Grasshopper allow for users to jump in and out of automatic and manual generation of mapping. Students will need to switch between these two modes over the duration of the studios research and project. The hand of the designer that provides proportion, light, color, material, and form will always be necessary to intervene during the design process; in other words, the computer is merely a tool but you must guide its executions.

This tutorial explores the interoperability between software packages such as ArcGIS and 3ds Max. It will examine how to extract topological information from GIS and how to extract color and light information from 3ds Max.

For further guidance, follow the tutorials under the deployment category: http://modelab.nu/?cat=5

Week 04 – How do you export to other programs? How do you use animation?
Towards the end of any project there is always a need to work across various software programs. This tutorial will show how to bake definitions. It will also review how to export geometry and data to other programs such as 3ds Max, XML format and vector based graphics packages such as CAD and Illustrator. Because it can record incremental change from one data point to another, data sources reveal both the articulation of differences and their transformations over time. These shifts that are revealed through parametric modeling can also be animated. A section on animation and rendering of the exported geometry will also be introduced.

RECOMMENDED VISUAL STUDIES ELECTIVES
Search: Advanced Algorithm
Parametric Realizations

RESOURCES:

GEO Location
Johannesburg: Lat: -26.20423 Lon:28.04685

SOUTH AFRICA / Johannesburg DATA RESOURCES:
Create Tables of Census data:
http://interactive.statssa.gov.za/superweb/login.do

Download Timelines:
http://www.statssa.gov.za/timeseriesdata/timeseriesdata.asp
http://eservices.joburg.org.za

Examples: http://www.gcro.ac.za/maps-gis/map-of-the-month

LIVE DATA SOURCES:
Twitter locate and track:
http://www.studionu.net/ceed3/?p=2443
https://twitter.com/ - !/search-advanced http://twdocs.com/

Topsy: http://topsy.com/ http://www.studionu.net/ceed3/?p=741 http://www.studionu.net/ceed3/?p=2443

Flickr download and track :
http://www.studionu.net/ceed3/?p=2443

Mobile Telephones/Data and Computing
Department of Science and Technology
http://www.dst.gov.za/
South Africa Broadcasting Corporation
http://www.sabc.co.za/wps/portal/SABC/SABCHOME
International Telecommunications Union
http://www.itu.int/en/about/Pages/default.aspx

Migration/Tourism
Department of Tourism Home
http://www.tourism.gov.za/Pages/Home.aspx
Gautrain (rapid transit)
http://www.gautrain.co.za/
Institute for Transportation and Development Policy
http://www.itdp.org/
Sustainable Urban Transport Project
http://www.sutp.org/
African Center for Migration and Society
http://www.migration.org.za/

GENERAL AFRICA RESOURCES
Basic guide to research on Africa at Columbia University
http://www.columbia.edu/cu/lweb/indiv/africa/joebib.html
Animated Atlas of African History

http://www.brown.edu/Research/AAAH/map.htm
Maps of Africa
http://www.columbia.edu/cu/lweb/indiv/africa/cuvl/maps.html
CU African Studies Internet Resources
http://www.columbia.edu/cu/lweb/indiv/africa/cuvl/index.html
CU International Data Sets
http://www.columbia.edu/cu/lweb/indiv/dssc/eds/international.html
South African Development Community:
http://www.sadc.int/about-sadc/overview/sadc-facts-figures/
The New Partnership for Africa's Development (NEPAD).
http://www.nepad.org/
South Africa The Good News
http://www.sagoodnews.co.za/fast_facts_and_quick_stats/index.html
Transformation (academic journal about development in South Africa)
http://www.transformation.ukzn.ac.za/index.php/transformation
Organization for Economic Cooperation and Development
http://www.oecd.org/southafrica/
http://www.oecd.org/statistics/
Urban Africa News
http://urbanafrica.net/countries/south-africa
CU African Studies: South Africa
http://www.columbia.edu/cu/lweb/indiv/africa/cuvl/SAfr.html
World Bank South Africa
http://web.worldbank.org/

JOHANNESBURG RESOURCES
City of Johannesburg
http://www.joburg.org.za/
Johannesburg 2040 Plan:
http://www.joburg.org.za/index.php?option=com_content&id=7343&Itemid=114
City of Johannesburg Maps Online
http://eservices.joburg.org.za/joburg/eservices - clkCntrl
Alexandra Renewal Projects, Johannesburg
http://www.alexandra.co.za/
Johannesburg Development Agency:
http://www.jda.org.za/
Rea Vaya (Johannesburg transit system):
http://www.reavaya.org.za/
Project Muse (social science digital content, Johannesburg University)
http://muse.jhu.edu/

MAPPING AND DATA RESOURCES
African Marine Atlas
http://iodeweb2.vliz.be/omap/OMAP/index.htm
Socio-Economic Data and Applications Center: Gridded Population of the World
http://sedac.ciesin.columbia.edu/gpw/global.jsp
United Nations Environment Programme: African Datasets
http://geodata.grid.unep.ch/results.php
Global Land Cover Facility: Satelite photography
http://glcf.umiacs.umd.edu/index.shtml
CU GIS Data set collection
http://www.columbia.edu/acis/eds/gis/spatialdata.html

GIS Data Depot: South Africa Data Sets
http://data.geocomm.com/catalog/SF/datalist.html
Statistics of South Africa
http://beta2.statssa.gov.za/
Agricultural Geo-Referenced Information System: South Africa aerial photography and maps
http://www.agis.agric.za/agisweb/agis.html
Gauteng City-Region Observatory (GCRO)
http://www.gcro.ac.za/
African Cities Data
http://data.worldbank.org/data-catalog/african-cities-diagnostics
Socioeconomic Data and Applications Center
http://sedac.ciesin.columbia.edu/data/sets/browse
Open Data for Africa
http://opendataforafrica.org/data#region=ZA
World Bank
http://maps.worldbank.org/afr/south-africa
Geo-Information Society of South Africa
http://www.gissa.org.za/ News

VISUALIZATION
http://spatialanalysis.co.uk/
http://www.visualcomplexity.com/vc/
http://www.densitydesign.org/research/map-of-the-future/
http://www.densitydesign.org/research/greenpeace-oceans-campaign/
http://www.flickr.com/photos/densitydesign/sets/72157625279830385/
http://www.flickr.com/photos/densitydesign/sets/72157626120133870/
http://www.flickr.com/photos/densitydesign/3408703849/in/photostream/
http://www.flickr.com/photos/densitydesign/3409542518/ http://www.golden-section-graphics.com/bse/
http://www.flickr.com/photos/tutu22/2506341206/in/photostream/ http://rafaelmacho.com/ - sprint

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