‘ATTACHMENT’ AS AGENCY IN OFF-SITE AND ON-SITE INDICATORS OF PHENOMENA IN GEOSPATIAL URBAN ANALYSIS TOOLS

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ABSTRACT

‘Attachment’ is a term used by social media philosopher Bruno Latour to describe the use of data to understand the ‘thingly’ quality that connects a system to its place over time (Latour, 2008). Using data to connect people and place in urban design, this paper describes an approach to create custom urban analysis tools to gather geospatially specific data off-site and on-site. Unlike traditional planning software such as ArcGIS this approach uses open urban design scale software, plugins and custom scripts to individually formulate and understand new relationships and new datasets of ephemeral *phenomena* gathered on-site and off-site. This integration of human design and simulation intelligence increases agency in urban design and planning. These tools for agency empower and connect not only government agencies but also business owners and everyday city inhabitants.

Project tools for the post-industrial “22@” district in Barcelona and comparative studies in Granada, Spain and Portland, Oregon are used to demonstrate these ideas.

SEARCH KEYWORDS
Big Data, Simulation + Intuition, Interactive Architecture, Open Source in Design, Parametric and Evolutionary Design, Design Computing and Cognition

1 INTRODUCTION: TOOLS AS AGENTS OF ATTACHMENT

Architects, planners and policy makers have long worked to find better ways for cities to support people and place over time. While parametric information technology exists in the discipline of architecture this research investigates the use of parametric modeling across architectural and planning scales to include time-based phenomena in city design.

Bruno Latour first used the term ‘attachment’ referring to the impact of information technology on social media and later to describe how architecture today may use information to dynamically incorporate people and phenomena of a place over time (Latour, 2005). Social psychologists have investigated the area of ‘place attachment’ to understand the participation of city users and identity and the impact of information today (Manzo and Devine-Wright). This paper describes an approach to urban design using parametric design tools to use dynamic time-based information gathered off-site and in-situ to measure people and cities. The very nature of formulating these custom tools creates a design agency to measure temporal phenomena, or the everyday experiences (Norberg-Schulz) that is new to the field of architecture and cities moving the computer from a tool of analysis to one of synthesis as agency (De Landa) of new understandings.

Tools to Measure the Urban Environment and Social Cohesion in 22@ Barcelona

This approach creates custom tools to formulate new relationships measuring phenomena gathered on-site and off-site, rather than using the ‘big data’ of existing data files (ex. GIS shape files) of predefined relationships and existing data of urban planning software from the top down. The research question asks if these new types of custom designed and open urban design tools may better allow an understanding of cities than existing closed tools. Urban design guidelines of the future may be driven by combinations of ever increasing computational models, merging hybrid agency of artificial intelligence and human agency of both design and user feedback (Latour, 2005). This is particularly evident in the study area of Barcelona’s post-industrial “22@” information activities district. The 22@ district, initiated in the year 2000 to be unlike the top-down traditional planning of the nearby Olympic Village that destroyed much of the historic fabric, uses open-ended parameters. Guidelines for individual block units augment social cohesion between workers and resident including requirements for 10% minimums each for social housing, social services and public space as well as protecting culturally significant built fabric.

Qualitative Information in Parametric and Urban Design

The approach described here supports understanding the urban site first as existing data and secondly as newly collected *indicators* of qualitative urban design characteristic in-situ phenomena. An initial qualitatively understanding of urban experience defines the over arching goal of the tool. Design characteristics, or criteria, are determined at the city block scale to formulate information. The criteria are then measured through data collection using measurable indicators both quantitative (ex. rooftop area and height) and qualitative (ex. roofing material type and building structure type). Output parameters provide qualitative and quantitative understanding including color optimized to measure urban relationships from the neighborhood to the block scale.

Background of Attachment in Urban Design: Form, Program and Phenomenon
Early parametric design that included parameters of phenomena of time and people has been credited to Ildefons Cerda's modular Barcelona *Eixample plan,* Frei Otto's time-based material machines (Spuybroek) and Christopher Alexander's Pattern Language urban taxonomy. Patrik Schumacher's "Parametricism – A New Global Style for Architecture and Urban Design" (Schumacher) contributed to formal understandings of urban design. Bernard Tschumi's idea of *event architecture* contributed to the measurement of program over time while Ian McHarg and James Corner contributed to the idea of indexing to measure adaptability of people and place over time. Artists such as Ned Kahn and Janet Echelman have used parametric design to make visible real-time environmental phenomena to understand identity (Echelman, Speranza, Buro Happold). A recent generation of urban designers is exemplified by Carlo Ratti's SENSEable Cities Lab including the recent contribution of three types of differentiated datasets as: 1) single system; 2) aggregate data from multiple authors and multiple purposes; and 3) scratch about specific phenomenon (Nabien et al). This last example describes a recent effort also argued in this paper to include phenomena through a customized understanding of data workflow. Project tools become agents of urban understanding.

Significance: Empowerment through the inclusion of qualitative phenomena
Why is the inclusion of everyday phenomena important in urban design tools today? Design processes today that use data to include phenomena of both human and environmental data generate new understandings of forces that shape human interaction in urban space over time. Measuring indicator urban design criteria makes information accessible at a variety of scales previously unavailable to traditional top-down urban design and planning. In Barcelona this may provide for new small-scale variations of pedestrian distances, transportation systems and emergent, democratic and shifting hierarchy across the otherwise homogenous unit based system of the "Eixample" grid. The phenomenal parameters at the parcel unit within the block become Latour's 'thingly' qualities including the characteristics of sound and human behaviors (Latour, 2005) with traditional geographic information systems measured here in the projects described below. The objective is to empower current generations of urban citizens with urban design and planning tools that are informed from the smallest and most actualized scale upward to the larger city (Speranza, 2012) (Franck).

Existing GI and Quantitative Municipal Data
The design process to integrate qualitative and quantitative information is integrated with geospatial latitude and longitude data in tabular format using plugins and custom scripts with architectural scale software Rhino/Grasshopper (Rutten, 2007) rather than fixed parameters and existing datasets from planning scale software such as ESRI ArcGIS and City Engine first pioneered by Roger Tomlinson in 1968 paper "A Geographic Information System for Regional Planning" (ESRI ArcGIS, 1999 and ESRI City Engine). Examples of municipal data collection include parcel area, building areas, tax assessment, property owner, owner address, zoning use, transit, etc. Sensors and measurement on-site has led to more recent approaches to urban computing inclusive of everyday phenomena in the project to be described here.

New Tools with Indicators
This paper describes a new approach where data may be measured and compared with a constant assessment of qualitative to quantitative transformation, through the lens of on-site and off-site

data collection with the purpose to understand people and place. Projects for the post-industrial "22@" district in Barcelona measured off-site and on-site are used to demonstrate these ideas.

2 CLASSIFICATION: METHOD, OFF-SITE, ON-SITE, EXISTING GI DATA

In regard to the generation of new data project will be categorized in those that primarily gather data off-site and those that gather data on-site. In both cases a general method of formulating these project tools follows:

STEPS
I. Purpose: Define an unmeasured urban experience problem in the 22@ district.
- What, Why significant, Who does it affect?

II. Research: Explore the parameters to measure this quality of attachment.
- Identify parameters.
- Comparative statistic in Barcelona with other cities.
- Develop a visual language for parameter.

III. Criteria: Explore urban design characteristics for parametric inputs.
Criteria to indicators: Identify indicators of these characteristics.
Map indicators for a 3 x 3 block set area (on-site only)
Analyze relationships individually
Repeat in other locations such as Granada, Spain (on-site only)
IV. Formulate: Develop relationships as analysis tool including weighting parameters
- Model parameters at abstract unit parcel
- Model parameters at parcels across abstract unit block
- Identify existing Grasshopper plugins HUMAN, ELK, Galapagos
- Model real-world case-study block in 22@, build 3D model

V. Model as Agent: Repurpose urban analysis tool for synthesis
- Expand the real-work block to 3 x 3 test area with case-study at center
- Develop parametric tool in Grasshopper including output
- Diagram final formula from grasshopper

VI. Findings: Look for emergent patterns and propose urban design strategies to propose change.

However the approach gathering data off-site versus on-site is important to understand the different type of agency of each approach and the urban design conditions in which they were gathered. The projects described here as case studies demonstrate always one of two related but different approaches to data collection and analysis.

Off-Site, Virtual Data Collection and Formula Development
Work off-site forces a critical examination of the origin of existing data and the creative gathering of 'first-hand' data via online tools. Existing data is provided by the 22@ planning office in form of PDF and GIS shape files. New data is gathering using Google maps, Google StreetView, Bing, Yelp and other online databases.

On-Site, The Addition of In-Situ Data
Work on-site in Barcelona made accessible new input data that is measurable in-person over time. Early work with mapping phenomena was done measuring indicators of these criteria at 33

meters intervals along the 100meter Barcelona blocks, totaling 108 points over a grid of three by three blocks. This first indicator set in Barcelona was refined and repeated in a different urban morphology in Granada, Spain with smaller *plazetas* and larger formal spaces. Returning to Barcelona an individual test area to best study the phenomena was selected along with continued refinement of the urban design criteria and subsequent indicator sets. A minimum 3 x 3 test area was selected and data gathering was done on-site, off-site and compared with existing GIS shape files.

2.1 Farm City (On-Site)

The urban analysis tool Farm City identifies the optimal use of existing rooftops for urban agriculture and water retention for a single city block (Figure 1). While such a tool uses the measurement of quantifiable data from online geometric data, it also uses off-site identification of roof type and building structural type as two qualitative criteria that are translated via a quantifiable rating system for a combined analysis tool.

Barcelona's annual rainfall is 628mm with annual rooftop water collection of 471 liters/square meter. Estimated annual water needed for a green roof is 3,650 liters/square meter. The estimated ratio for green roof area to rooftop water collection is 6:1. Water is costly in Barcelona for residents. Agricultural space is ever decreasing.

Urban farming has become a valuable component for both reduction of transportation cost as well as a place for social interaction. A key component to the 22@ plan is the protection of many historic buildings. This tool uses the existing form and height of building mass for any given test block- it does not simulate form but suggests qualities of use for agriculture or water retention.

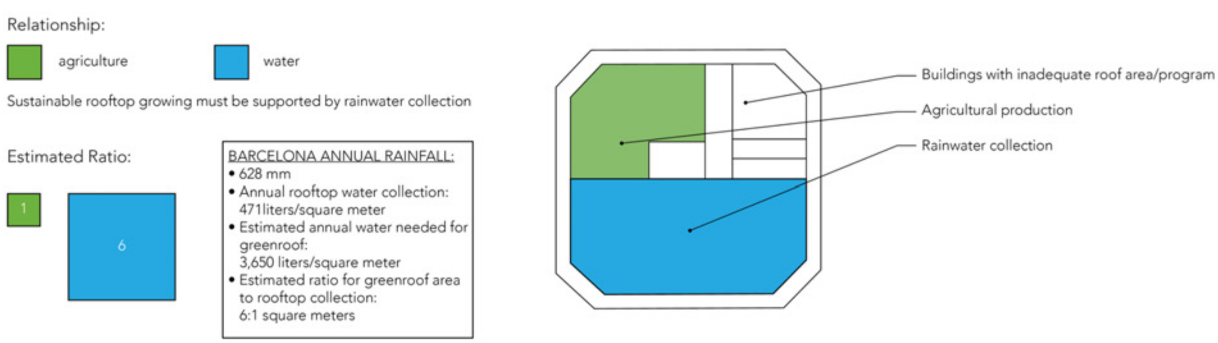

Figure 1: Farm City, Unit of rooftop agriculture or water retention, ratio 6:1 and block prototype, students Erica Thompson and Wes Thompson

To measure these rooftop uses four parametric criteria were identified and used as inputs: area, structural capacity, material and height.

> **Surface Area:** A minimum surface area was determined for any rooftop/parcel size.
> **Building Height:** Relative height to adjacent existing buildings was measured for passive water catchment to or from adjacent rooftops.
> **Building Type:** Each rooftop was assigned a rating 0 to 1 based on building's structural and morphological type to support water and earth roof loads.
> **Material Type:** Each rooftop was assigned a rating 0 to 1 based on the toxicity of the rooftop material from clay tiles to asphalt.

The criteria from one existing block in 22@ were inputted into a formula (Figure 2) (inputs, evaluation scores, degrees of influence, add values and remap results 0-1, outputs) using Rhinoceros Grasshopper (GH). Qualitative criteria such as the roof type (left side of Figure 3) and building structural type are converted through the rating system. Geometric data such as the roof area and relative height in the z-axis (right side of Figure 4) are already in calculable format using a tabular assessment for geographic analysis. The Grasshopper plugin Human (Heumann) was used to select object attributes to input and output color for visualization. Data comes from 22@ planning department maps, Google Aerial View and Google Street View. A fifth parametric criterion of sun/shading on the rooftops for agriculture was not included but variation in plant types was instead assumed for various rooftop lighting conditions.

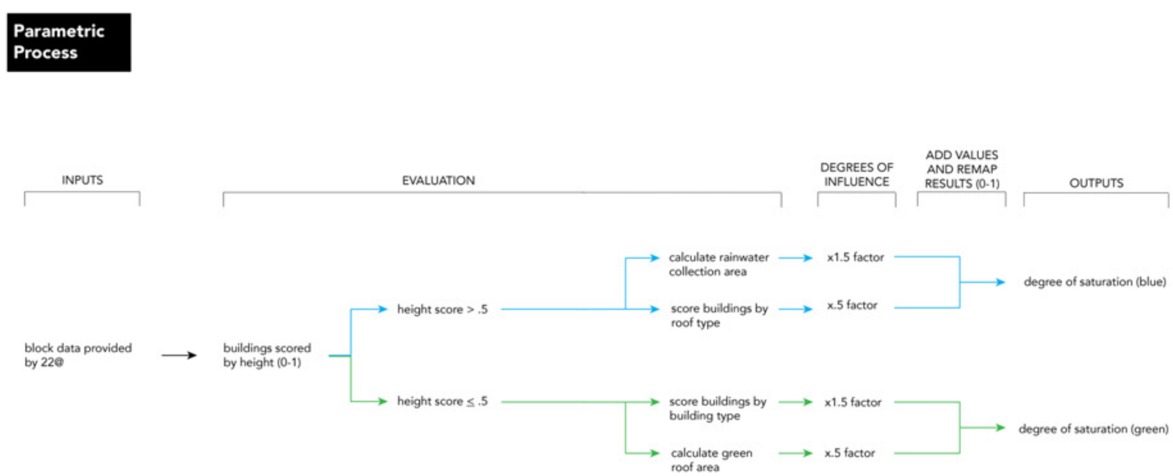

Figure 2: Farm City, Formula of Parametric Process, students Erica Thompson and Wes Thompson

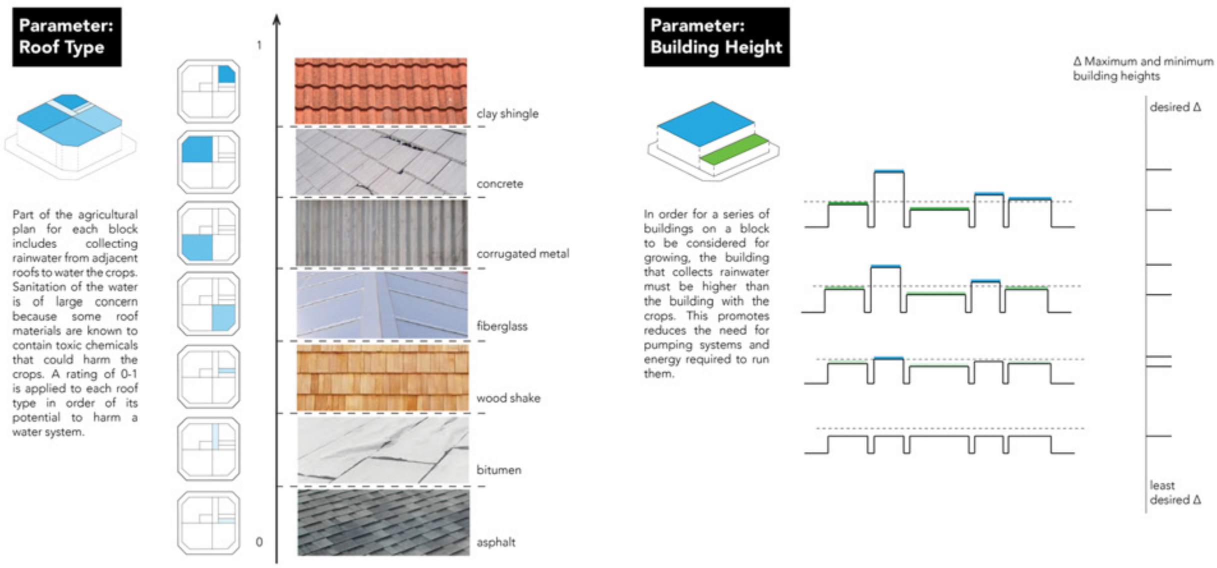

Figure 3: Example criteria, Roof Material Type Rating and Relative Roof Height, students Erica Thompson and Wes Thompson

Output data of the analysis and assessment uses Human to visualize 1) the simulated suggestion for agriculture (green), water retention (blue) or neither (white) and 2) the degree of intensity via color saturation (see Figure 4). The final output is a suggestion of the optimized use of rooftops based on the criteria. The scale of the urban block suggests a new self-sufficiency and coordination at the block scale (Guallart). Traditional urban scales often consider the individual building or the larger district scale. The tool may also be used to evaluate the criteria for future building proposals for the block. It is important to recognize limits of the tool such as accuracy of the input data (heights, material types, etc), the accuracy of the formula and the limits of comprehensive value as neither a holistic urban design tool nor an architectural tool.

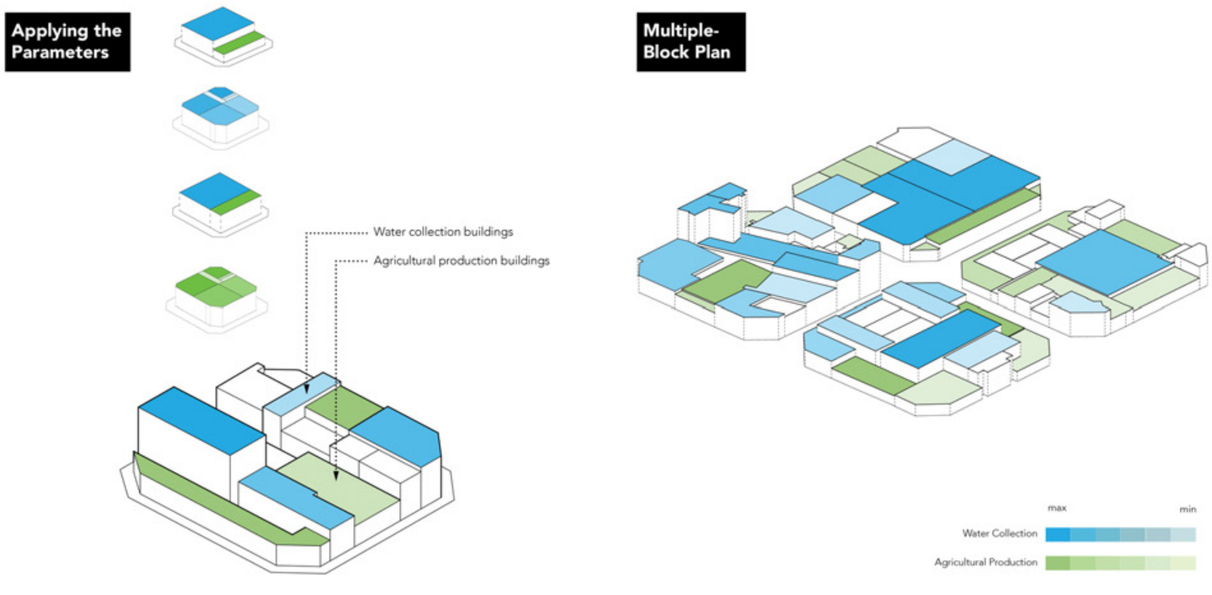

Figure 4: Parametric analysis of one block and multiple blocks, students Erica Thompson and Wes Thompson

This tool developed off-site is important because it demonstrates the ability to measure data remotely, the identification of material roof types and using the described method above to carefully translate qualitative types to quantifiable rating systems. This allows the custom developed tool to formulate and combine different types of data with specific use of the HUMAN plugin. It is important that this data is generated from 'scratch,' even if done so remotely, to make datasets clear and filtered for use in Grasshopper.

2.2 Interactive Sound Tool (On-Site)

A second urban analysis "Interactive Sound Tool" will demonstrate the additional use of on-site information and geographic information. The sensory phenomenon of sound is combined with other urban criteria to provide a tool for citizens to understand scenarios of sound in real-time and location based information, extending the use of urban design tools into the realm of sensory qualities.

Like the previous project example this urban design tool identifies criteria and a formula to generate an analysis. The following initial criterion were located using a custom scripted geographic information tool in the form of CSV tables: zoning use, sensitivity to noise (rated 1-

5), fenestration operability (open/closed), density of people, construction (yes/no), noise source (emitter) and decibel level. All criteria were observed first hand including verification of zoning use with existing data and with the use of mobile phone apps for the example of decibel levels. Data was recorded and mapped with 108 points over a 3 x 3 grid of Blocks first in the Poblenou area of the 22@ district in Barcelona and later comparatively in small plaçetas in the Albaicin and other areas in Granada, Spain. Data mapping was done iteratively over 24 hours a day. Again Grasshopper was used to visualize data using colors. An important differentiation of data occurred when it was noticed by reviewer Karen Franck and Anthony Holmes that sound data was not only quantitative but also qualitative as types such as human sounds, vehicular sounds, and natural sounds against an abstract scale of human tolerance of sound (Figure 5).

Figure 5: Interactive Sound, Data Analysis, students Alexandra Lambrechts, Pedro Peralta and Eleazar Racoma

A final iteration of the tool utilizes the following criteria (Figure 6):
- Zoning Use: in particular measuring residential and ground floor commercial activities
- Noise Source: type of noise source
- Decibel Level: measurement of decibels at location and time
- Sound Output: type of sound
- User Persona: tool user persona (Ex. couple with infant looking to rent or purchase an apartment, or people looking for indicators of urban activity on a weekend evening.)

Sound quality types are cataloged and differentiated for use by a 0 to 5 rating system for use as inputs in GH and Human.

The input data in quantitatively converted with the rating system and, somewhat different that the Farm City project from the Eugene based work, compiled in a spreadsheet format and imported into GH in the CSV format. Like ESRI ArcGIS latitude and longitude are converted into column entries. A custom scripted was used to calculated column and row information into an assessment and visualization of the information. The limitations of time and expertise prevented the further development of a working app interface to test the tool.

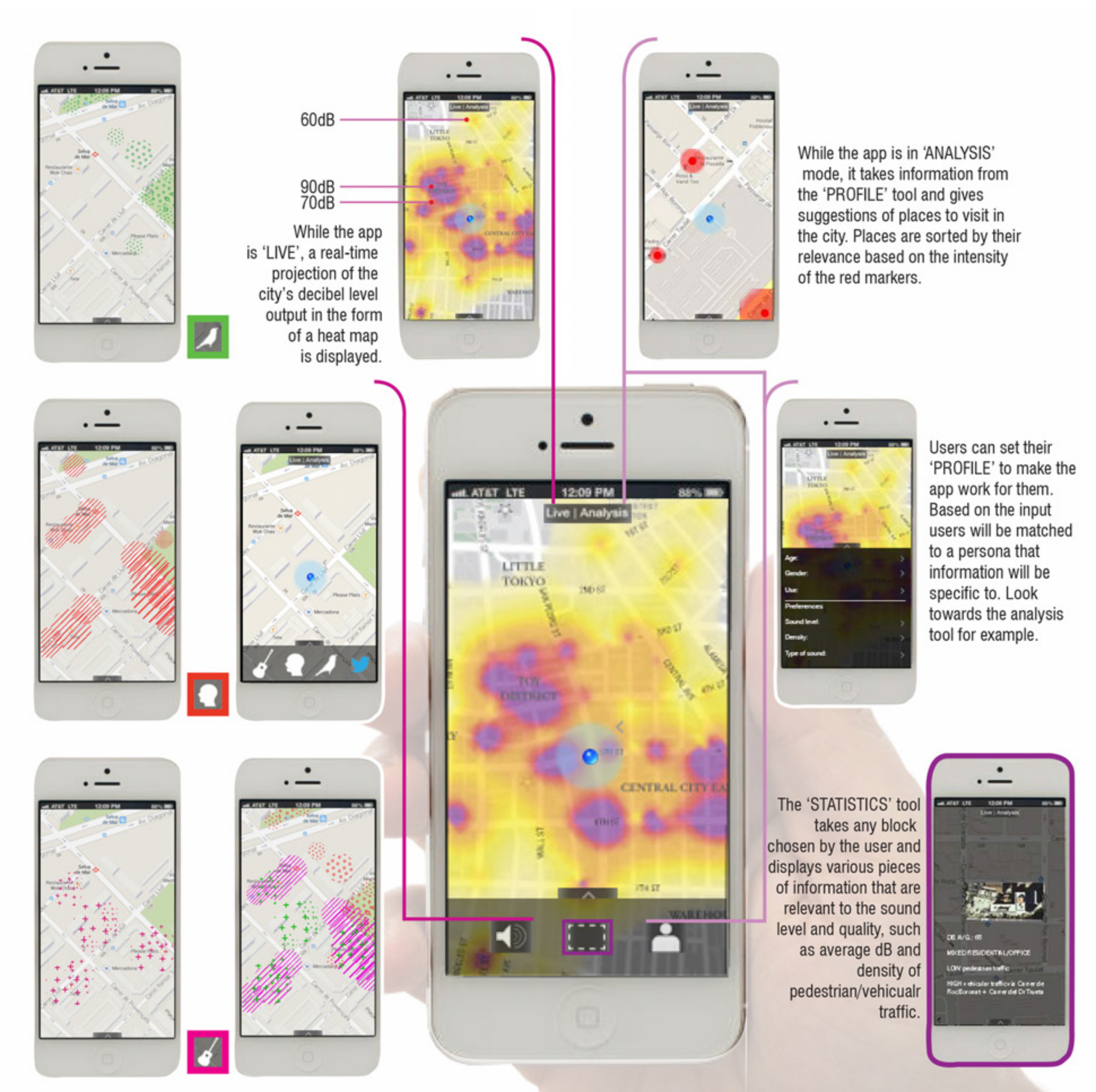

Figure 6: Interactive Sound, Mobile App Interface, students Alexandra Lambrechts, Pedro Peralta and Eleazar Racoma

The output for this tool in an interactive visualization (Figure 7) of sound quality and type for a given neighborhood and urban room location. The interface as a mobile app or situated technology such as a kiosk would provide a feedback loop with users. The question this raises is whether such a tool without a physical intervention in public space and without fixed, traditional guide to urban information is urban design- where does the analysis shift to synthesis and simulation and thusly agency begin? It also suggests that user behavior as changed by the tool might also affect the synergies of qualitative and location based information, and more importantly achieve the desired goal of urban design to affect change in the agency of the people who occupy cities.

The importance of this tool is the value of being located in-situ, on-site to first identify the significance of the sensory human experience of sound in urban space. Phenomena such as sound are important indicators of various types of human behavior including recreational, dining, business delivery and children at play in how we measure place in urban space (Lynch) (Vitello). Such observations even if measured off-site would be difficult to differentiate and unlikely to exist in predefined parametric urban analysis software.

2.3 Complete Street Fronts (Off-Site) and Street Vitality (On-Site)

The continued project participation for one project in spring and summer of 2013 allowed a progressive development from existing data gathered off-site to new on-site data for the assessment of ground floor storefronts and urban design. These projects will be described briefly to demonstrate the variations of scale and purpose of qualitative indicators and geographic information for urban design tools to attach to site, in Bruno Latour's idea of attachment in real-time (left side of Figure 8).

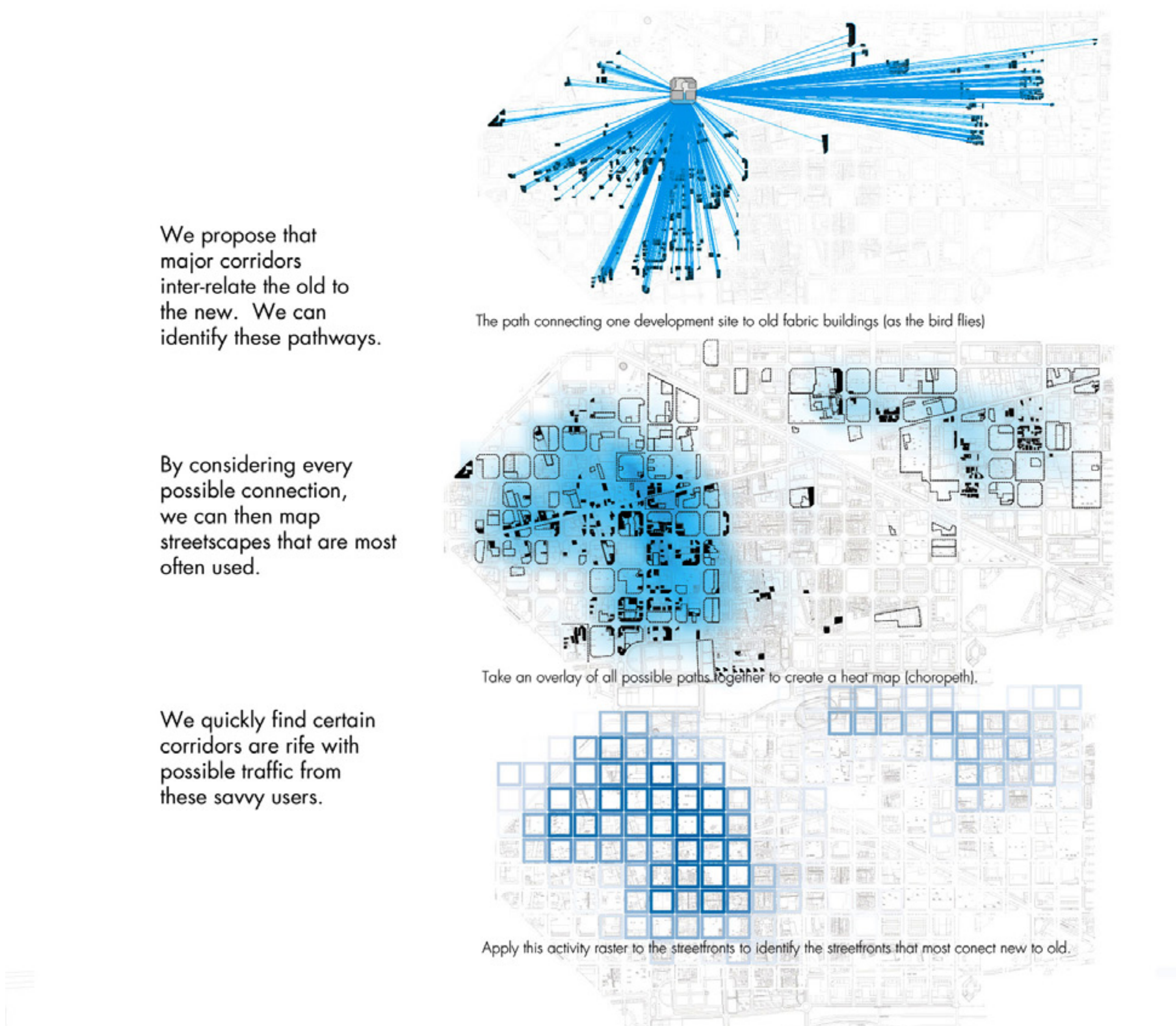

Figure 7: Complete Street Fronts, by students Andres Utting and Dan Anthony

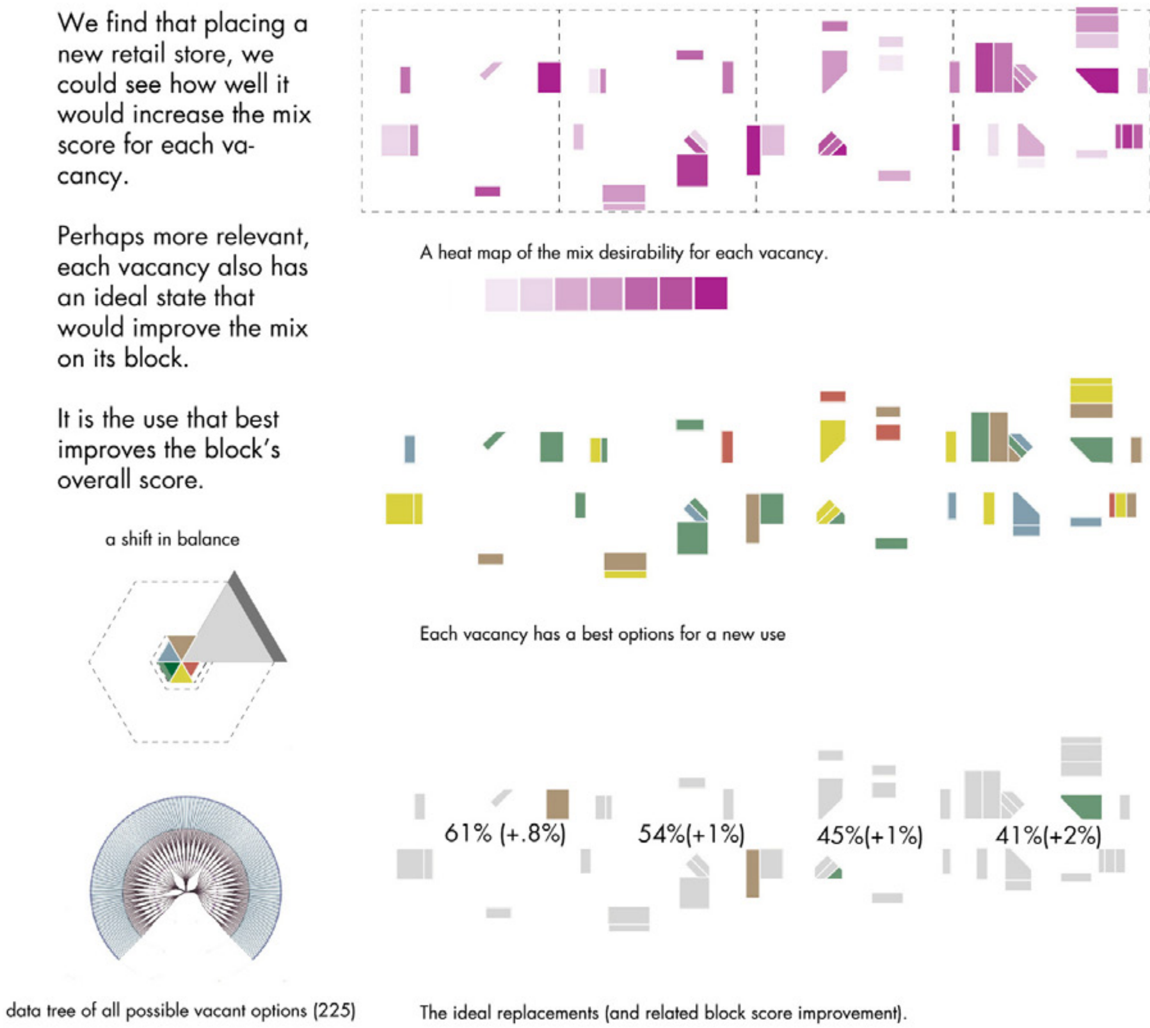

Figure 8: Complete Street Fronts, by students Andres Utting and Dan Anthony

The project "Complete Street Fronts" was first developed off-site, in Eugene, Oregon, and relied on existing data from the 22@ planning office in Barcelona and other open source data found online. Input data as criteria included primarily indicators of public and private uses of ground floor spaces such as retail, service and leisure and lobbies to residential, office and institutional uses above. Data was sourced from Google Maps and search engine from various interfaces. The tool provides an aggregate analysis of block uses of street corridors (right side of Figure 8).

The challenge of this tool was to evaluate the business difference for potential business owner and users by hours, prices, name and business type without an extensive, existing database (Yelp.com database in Barcelona is less subscribed than in the United States). The next tool "Street Vitality" in lcaBCN on-site in Barcelona will include this data and architectural characteristics of storefronts. Importantly, both datasets did not already exist in the larger scaled data of city shape files used in planning GIS software.

“Street Vitality” was a follow project grounded in the criteria and scale of the initial “Complete Street Fronts” tool. “Street Vitality” expands on the purpose to include the place branding identity of the site. The unit block in both cases is defined not by the unit of the built fabric but on the unit of street right-of-ways or intersections, with the street corridor as the primary geographic unit. The space of street rooms is key, not built the form. Measurements aimed to capture in-situ indicators of street appeal, identity, gathering, local patronage and projection into the street.

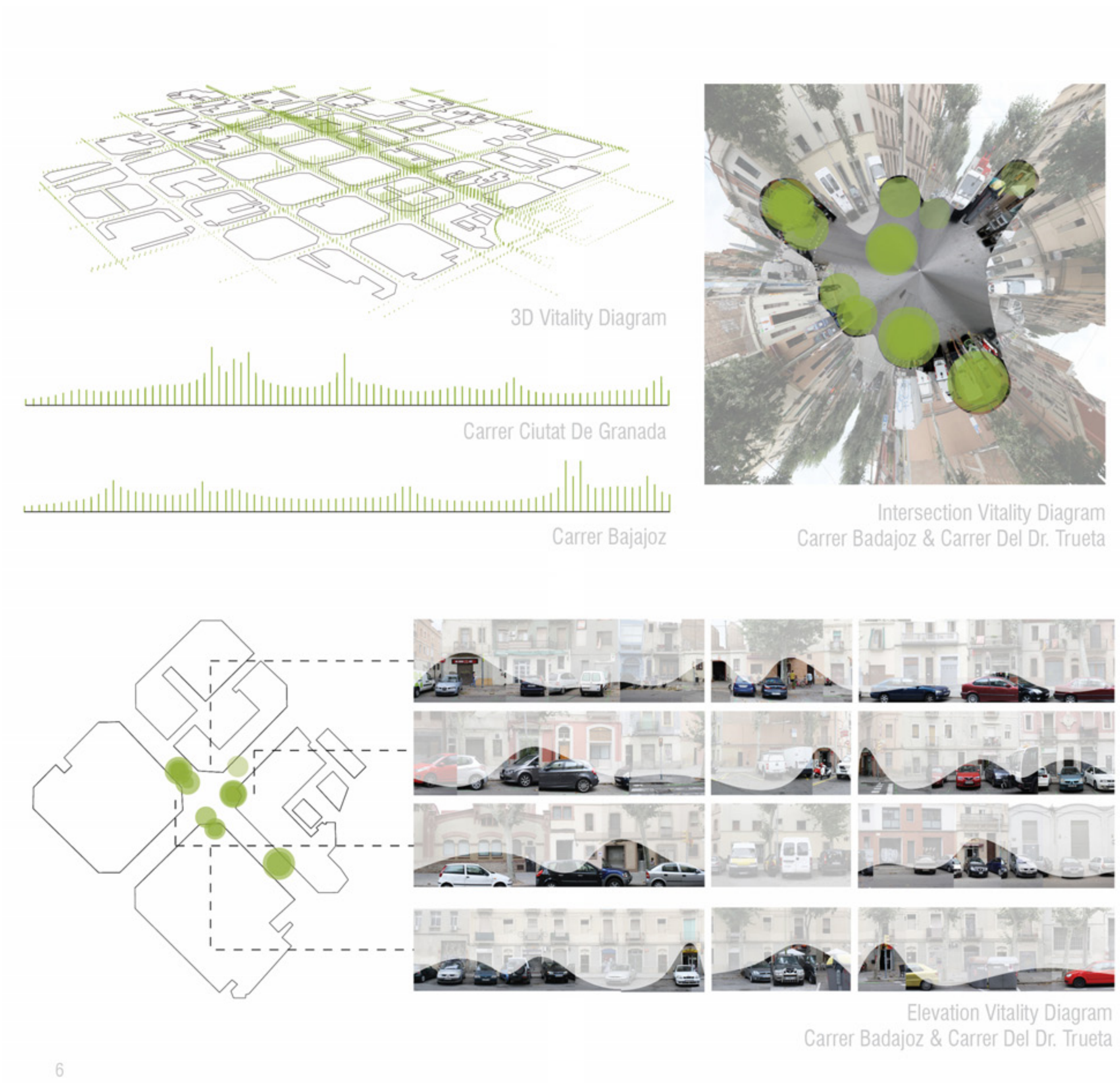

Figure 9: Street Vitality, by students Dan Anthony, Jose Cornejo, Danielle Hoet, and Jenna Pairolero

Final indicators of this criterion included primary data for appeal, projection and percentage of open façade and existing data for building use and typology. Data processing used FormHub survey software and Rhinoceros Grasshopper. The resulting output data utilizes the z-axis for individual uses and creates a unique diagram (upper right of Figure 9) to communicate street vitality type, returning the data to a qualitative geographic visualization of the architectural scale. The tool would be used for storefront enhancements, organization for business promotion, and search results for patrons and connectivity between neighboring business owners. The use of indicators and geographic information synthesized at the architectural scale in tabular format makes this possible.

The inclusion of these two tools here point out the complementary nature of off-site dataset analysis to focus the economy of tool develop on criteria formulation and on-site dataset analysis to focus on the use of indicators to measure specific phenomena. Dividing attention between off-site formulation and on-site applicable dataset generation allows for an efficient workflow. This in turn allows clarity in analysis, visualization and reported findings of the tool.

6 CONCLUSION

EMPOWERED PARTICIPATION

The importance of the method and the tools demonstrated through projects shared here is the empowerment of participation that open software allows for the inclusion of specific measurement of people and place over time. This effort is far more challenging with planning software such as ArcGIS that includes prescriptive parameters and government managed datasets in the form of shape files. One may argue that the agency of open tools is the very specificity of their design intent, rather than the importance of holistic design in any one tool. The specific connection to place between the software and especially on-site data gathering sensors implies an agency that may be set forth by the human design but given the digital tool ‘attachment’ to site to generate an agency that is not purely from the human designer (Latour, 2008).

OFF-SITE ON-SITE

While the on-site measurement of phenomena in real-space was very important to the agency of connectivity to site, the off-site limitation of datasets focuses an economy of effort on the custom formulation of the project. In this case the consciousness of data as originating from one source, multiple sources or from scratch (Ratti) was far more focused. The difference of off-site and on-site data collection suggests further investigation into custom scripts that augment plugins such as ELK to input even more data than the available roads, bikes, rail and buildings currently available. Future research will focus on writing such custom scripts to include newly data gathered on-site and off-site.

FUTURE TOOLS FOR EVERYDAY USE

Future and current urban analysis tools will continue to investigate challenging indicator datasets such as indicators of qualities of social behaviors (Kolarevic). Current work with Salvador Rueda of the Agency of Urban Ecology of Barcelona focuses on the creation of a ‘social simulator’ to measure social cohesion within the 22@ and larger St. Marti district in Barcelona (Rueda) building on previous research by the author (Speranza, 2013). The method described above and the careful evaluation of qualitative criteria via quantitative codification will be further scrutinized with stricter dataset generation protocol.

Additional tools in development include a small scale PM air pollution tool using similar methods mentioned above and a sensory interface for public bike share tool that uses user feedback to drive community connectivity.

THE AGENCY OF URBAN ANALYSIS TOOLS

Will open design tools in the hands of urban designer along greater accessibility to information datasets and will increasing accessibility to low cost sensors replace the authority of traditional city planning? With the increased everyday reliance on real-time tools such as Google Maps, open street maps, Yelp and third-party transit tools, increase the value of solving the problem of connecting information and urban design tools? Furthermore the agency of that information design will be more and more autonomous and reliant on both human method and the agency of the information systems themselves.

The research of these new types of urban design tools, focusing on the development of custom/open tools to measure differences of data gathered on-site and off-site, opens the question if urban design guidelines may be driven by the agency of phenomenological connection to site and the human agency of both user and designer feedback. If the purpose of urban design is to seek a more efficient and connective social environment in cities then the real-time measurement of changes in behavioral phenomena in physical public space is ever more valuable. We need urban analysis tools that attach. The very accessibility to open information tools is a key to achieving democracy in our current and future cities.

7 WORKS CITED

Ando, Tadao (1991) "Toward New Horizons in Architecture." New York: Museum of Modern Art, pg. 75-76.

ArcGIS (1999 1st ed.) Environmental Systems Research Institute.

Speranza, Philip (2012) "Place Branding from the Bottom Up: Strengthening Cultural Identity through Small-Scaled Connectivity." Conference Proceedings: Roots-Politics-Place. Berlin: inPolis: 237-252.

Speranza, Philip (2013) *Green Design, Materials and Manufacturing Processes*, "Parametric Places 22@: Smart Urban Analysis Tools and Place Branding Value." SIM Conference Proceedings Editors: Helena Bartolo et al. London: Taylor & Francis Group. pp. 701-705

De Landa, Manuel (2011), *Philosophy and Simulation: The Emergence of Synthetic Reason*, New York; Bloomsbury Academic.

Echelman, Janet, Speranza, Philip and Buro Happold Engineering (2005) *She Changes* (public sculpture). EU Funded with City of Matosinhos, Portugal.

Franck, Karen and Lepori, R Bianca (2007) *Architecture from the Inside Out: From the Body, the Senses, the Site and the Community*. London: Routledge

Guallart, Vicente (2010 1st Edition) *Self-Sufficient City*. Barcelona: Actar.

Heumann, Andrew (2011 1st ed.). Human (Formerly Heumann Design/Tech). Plugin to Rhinoceros 3D by Robert McNeel & Associates.

Kolarevic, Branko (2013), "Closing Comments," Sustainable Intelligenct Manufacturing International Conference, Lisbon, Portugal, June 29, 2013

Latour, Bruno (2005), 'Reassembling the Social: An Introduction to Actor-Network-Theory', Oxford; Oxford University Press.

Latour, Bruno & Yaneva, A (2008) "Give Me a Gun and I Will Make All Buildings Move: An Ant's View of Architecture." In R. Geiser (ed.), Explorations in Architecture: Teaching, Design, Research. Basel: Birkhäuser. 80.

Lynch, Kevin (1960) *The Images of the City*. Cambridge: The MIT Press.

Norberg-Schulz, Cristian (1976) "The Phenomenon of Place." *Architectural Association Quarterly* 8. No. 4. London: AA. Pg 3-10

Rueda, Salvador et al. (2012) *El Urbanismo Ecologico: Su Application en el Diseno de un Ecobarrio en Figueres.* Barcelona: Agencia de Ecologia Urbana de Barcelona.

Rutten, David (2007 1st ed.) Grasshopper & Galapagos. Seattle: Robert McNeel & Associates.

Schumacher, Patrik (2008) "Parametricism as Style – Parametricist Manifesto." London: Patrik Schumacher. Presented and Discussed at the Dark Side Club, 11th Architectural Biennale, Venice 2008.

Spuybroek, Lars (2002) "The Structure of Vagueness." *TransUrbanism* edited by Joke Broouwer and Arjen Mulder. Rotterdam: NAi Publishers. Pp 65-88

Vitiello, Rosanna and Willcocks, Marcus (2006) "The Difference is in the Detail." Place Branding Vol. 2, 3, 248-262.

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