Permeable and Elastic Terrains

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ABSTRACT

In this paper we discuss the development of an interactive, networked, location- and motion-aware instrument for collectively sculpting the urban fabric. Our research interprets the city surface as a 'thick', elastic, and permeable medium that responds to the migrational flows of its inhabitants. The mobile artwork *Impossible Geographies 02: Urban Fiction* explores the subjective, hybrid, and migrational nature of urban geographies. Doing so, it develops a location-aware prosthesis that involves bodies and how they move through space. The mobile instruments become the lens through which to look at and modulate the virtual fabric and its threads. .Its digital landscape presents a dynamic, negotiable terrain that involves multiple authors and produces multiple viewpoints. Constantly resculpting the virtual 'fabric' of *Urban Fiction*, participants collectively weave a performative map of a subjective urban geography.

Author Keywords

Digital cartography, hybridity, locative media, mobile computing, subjectivity, urban geography

ACM Classification Keywords

J.5. Computer Applications: Arts and Humanities – *Fine arts*. H.5.2 Information interfaces and presentation: User Interfaces – *Auditory (non-speech) feedback*.

INTRODUCTION

The contemporary city is seen as a fluid terrain, linked and constantly re-linked to other geographic places; cultural, economic, subjective, and political links that manifest not only physically but also in electronic flows, memories, fragmented identities and other belongings. According to Lipuma, the social imaginary of a city depends on "necessarily fluid and transversal spaces and a temporality that is intrinsically connected to temporalities elsewhere"

[6]. Mapping and representing this terrain, commonly relies on cartographic forms that serve "as an anchoring structure which sustains subjects through legible and familiar articulations of belonging" [7]. Such 'legible and familiar articulations', however, don't leave room for contemporary notions of a multiplicity of actors and their different narratives.

'Imaging' the contemporary city, we are challenged to invent cartographic forms that represent the fluidities and subjectivities involved in this urban discourse. And interacting with such a city, we are increasingly confronted with the politics of surveillance and ubiquitous technologies. The challenge is to unfix the subject from the grid to create a map that is open. Current advanced mobile media open up an opportunity to render Deleuze and Guattari's map that offers "multiple entrances". [3] Such a map creates alternative connections that question traditional forms of mapping, producing forces of diversification, rather than homogenization. This paper discusses an artistic research project that explores the tensions of a digital urban 'playground' and develops representational 'tactics' that extend its potential of intervention.

The mobile artwork *Impossible Geographies 02 (IG02): Urban Fiction,* currently under development, seeks to articulate the performative relations between places and identities, drawing "a migrational or metaphorical city [that] slips into the clear text of the planned and readable city" [2]. The prosthetic interface and its underlying behaviors aim to produce and to make tangible dynamic hybrid positions that open up multiple conjunctions.
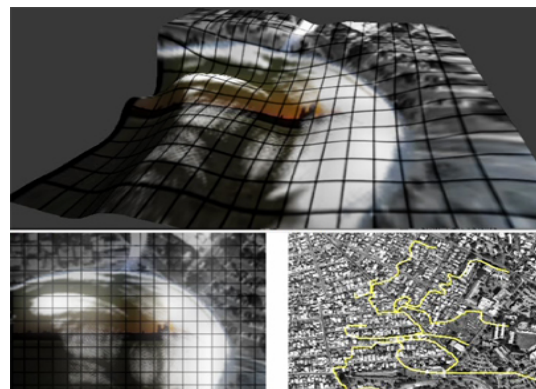

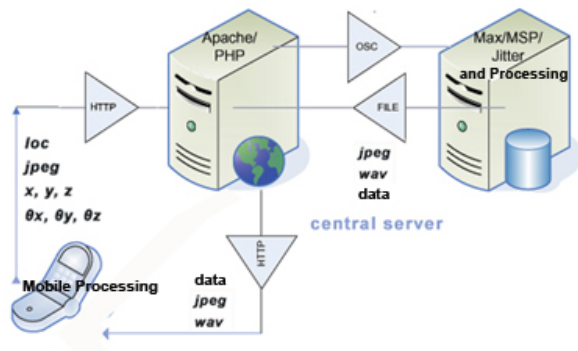**Figure 1.** *IG02:* **Visualization study of fluid interferences**

Figure 2. *IG 02*: archdiagram

'Impossible' here refers to what is commonly not seen and, in the context of cartography and location, what is commonly not mapped. The term 'geography' is concerned with cultural practices and differences in relation to space [7]. It interprets 'space' and 'place' as a fluid, migrational construct which we always only temporarily belong to, rather than as something geographically fixed and bound (Figure 1). Thus, the 'impossible geographies' produced in this research project, in a sense, address the hegemonic and colonial views that conceal, disguise and obliterate the reality of these 'imaginary places.'

IMPOSSIBLE GEOGRAPHIES 02: URBAN FICTION

IG02: Urban Fiction is a locative media artwork that will produce an alternative, sculpted fabric that overlays the urban landscape. To facilitate the dynamic, collective interaction with the urban fabric, it uses networked, location-aware and motion sensing mobile phones. Moving along and sweeping through the urbanscape, participants will resculpt the scape around them, weaving an alternative urban geography. The project explores the constitution of territories and their break lines and how we belong to and possibly hybridize these charged terrains. It turns mobile phone devices into a motion sensitive 'lens' enabling an apparently tangible interaction with the urban fabric, with its multiple viscous layers. The result, seen through the lens of the mobile phone display, will be a fluid, fragile web of belongings and un-belongings that can only exist outside the static grid of a single-authored map.

The negotiation instrument

The interaction instrument aims for producing a 'lens' through which subjective changes of the urban fabric are made visible and related to other peoples' presence. Participants will use networked, location-aware and motion-sensing mobile phones to contribute to and interact with the 'impossible geography'. As they move through and inhabit different places within the urban fabric, their phones will send the participants' location (GPS data), the participant's motion registered through accelerometers connected to the mobile device, as well as images and sounds recorded on site to a central server. A computational process on the central server will interpret, mix, and put into context these data streams with other information about these places, such as demographic information (GIS data). The data of the resulting 'image' will then be returned to the mobile phones, where it will be rendered and displayed via the screen (Figure 2). The fragmentary sound scape will be composed on the server, and, streamed back to the phone, will be available via headphones.

Renegotiating Urban Terrains

While the mobile phones are turned into 'lenses' that probe into the urban environment and display the turbulent changes, the participants' bodily movement through space is the source of these turbulences. The project's approach relates De Certeau's politics of everyday practices and its 'tactics' to intervene with hegemonic powers [2] to the geophysical concepts of gravitational forces and plate tectonics. As a result, the urban fabric is translated into a fluid particle force field whose shape is determined by peoples' movements and interactions, and geo-referenced datasets. As participants traverse the city's physical zones and virtual borders, they act on the particle grid like moving force fields (Figure 3). The connections they make, gaps they produce, and areas they surround in the 'real' terrain will be expressed in deformations, stitches and cracks that eventually reconfigure the 'map' of the terrain. Their turbulent transitions will be attenuated by geo-referenced knowledge about the terrain that defines the material qualities of the fabric, adding weight and resistance. As it tempers the deformation of the fabric, the result will be an alternative urban 'skin' whose plasticity and permeability is dependant on the tension between what is allegedly 'known' and what is subjective, migrant and 'lived' [1].

Ripping and Stitching the Terrain

To depict the connections and gaps created by bodies moving through a landscape, that is to say, the charging of the terrain, the mobile instrument aims for performing like a performative prosthesis. The aim is thus to render the participants' interventions tangible, that is, to create an interaction experience that relates to the participant's body and its sensations. Hence, as the urban 'plates' move, the articulation of the fabric's evolution departs from the geological model of shifting zones and, rather, reminds of 'tearing a fabric' or even 'stitching flesh'(Figure 4).

Figure 3. *IG 02*: fabric distorted by force fields (Processing)

Determining the local resistance of the virtual fabric, GIS data will define the attributes of the system's springs. This allegedly objective knowledge relates to the zonings of the city that are to be renegotiated by the participants. Demographic data, such as age, ethnicity, and income, defines the springs' rest length, stiffness (or strength), and damping. Participants will constantly push and pull the particles, thus molding the grid.

Tracked over time, participants' movements across various urban zones will inflict permanent changes in addition to the above temporal deformations. Rips and stitches occur along the path, where the difference in GIS data values exceeds a certain level and, at the same time, the participant's force overstretches the springs. That is to say that particles and springs are dynamically removed and added to the system. As a result, the map of the terrain tears apart at places and densely entangles at others (Figure 4).

Locative Media and Performative Cartography
The location-based technologies that enable the experimental playground of *IG02: Urban Fiction* are the same that sustain and advance the politics of exclusion, driven by anxieties of security and closure. Thinking of alternative forms of geography, played out with these technologies, engages a series of questions such as authorship, censorship, and the archive in relation to map-making processes and politics of location. They reinvoke forms of urban resistance akin to Situationist strategies of dérive and detournement [1]; and, paradoxically, using surveillance technologies to intervene with the urban grid introduces questions of remote control and profiling.

IG 02: Urban Fiction extends the discourse on locative media and its creative interventions to the arena of cartography and its issues of representation. Doing so, it shifts the interrogation of urban geography from the centre to the margins. According to the social anthropologist Thomas Widlok, "both a map and a GPS depend on a history of human-environment interactions [] from which the experiential aspects of the humans involved have been systematically eliminated to leave nothing but formalized, depersonalized procedures" [8]. The relationship between the map and the territory shapes thus another paradoxical playground for locative media interventions [5].

PARTING THOUGHTS

The negotiation of political and cultural views enabled by *IG 02: Urban Fiction* unleashes locative media's potential for augmenting the physical environment with generative relations and adaptive semantics. Anthropologist Anne Galloway suggests that the reconfiguring of our understandings and experiences of space and culture by
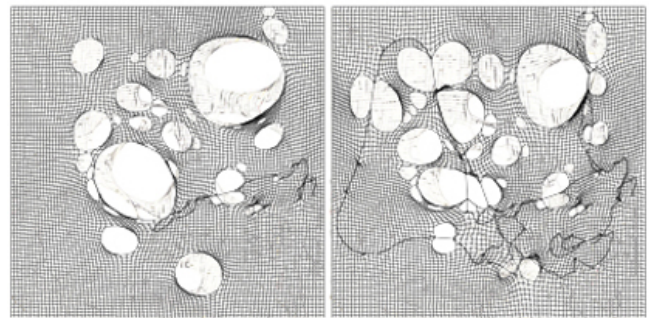

Figure 4. *IG 02*: **ripping and stitching the fabric (Processing)**

locative media can contrast the fixed rigidity of traditional cartographic forms as well as the authoritative purpose of surveillance mechanisms [4]. The artistic use of these technologies opens up an ambiguous performative zone in which known data such as global position meets the uncertain emergence of the unmapped, unknown data such as everyday practices. In turning everyday devices of communication into performative mapping devices, the work positions itself in the problematic space of using surveillance as a way to uncover relations in the city. Doing so, the work aims to redefine urban cartography as a multi-dimensional, participatory instrument.

REFERENCES
1. Debord, G. *The Society of the Spectacle*. Black and Red, Detroit, IL, 1977.
2. De Certeau, M. *The Practice of Everyday Life*. University of California Press, Berkeley, CA, 1984.
3. Deleuze, G., Guattari, F. *On the Line*. Semiotext(e), New York, NY, 1983.
4. Galloway, A., Matt, W. Locative Media as Socialising and Spatialising Practices: Learning from Archaeology. In *Leonardo Electronic Almanac* 14, 3 (2006).
5. Gemeinboeck, P., Tanaka, A., Dong, A. Instant Archaeologies: Digital Lenses to Probe and to Perforate the Urban Fabric. In *ACM Multimedia 2006 Proceedings*, ACM Press (2006).
6. Lipuma, E. and Koelble, T. Cultures of Circulation and the Urban Imaginary: Miami as Example and Exemplar. In *Public Culture*, 17, 1, Duke University Press (2005), 153-179.
7. Rogoff, I. *terra infirma: geography's visual culture*. Routledge, London, UK, 2000.
8. Widlok, T. Orientation in the wild: the shared cognition of the Hailom Bushpeople. In J*ournal of the Royal Anthropological Institute*, 3 (1997).