↑ *iPhone 4 line on launch day at San Francisco Apple Store,* Steve Rhodes. → http://www.flickr.com/photos/ari/4733684822

In the outer space
José Luis de Vicente

This changes everything. Again.

While I was writing this article in the summer of 2010, the mobile telephone operators in Spain were marketing the fourth generation of the iPhone, Apple's flagship phone. The scenes used for the media launch are now so familiar that the slogan used for the product seems rather ironic: «This changes everything. Again». Yet again, they were huge queues in the stores featured on the TV news, a calculated lack of stock that meant that many people were left without the product, and the resigned indignation of having to pay the telephone companies that managed to turn the act of contracting a new line into a sophisticated form of extortion.

Fifteen years ago, this marketing hysteria was to be found at the premier of the summer blockbuster or concerts by the bands targeting the teenage market. It now seems to only be within the reach of the mobile telephone, consumer computer and the videogame industries —a testimony to the capacity of electronic articles to attract and the key role that they now play in pop culture. Nowadays, the contents are consumed, produced and shared; they are remixed, scored and tempered, but above all, it is all about the interface. And the production of interfaces has become the largest industry of seduction and desire.

The iPhone is a very specific electronic item, particularly if we consider it in the context of the history of interaction design. Its multitouch screen introduces manual gesture recognition in human-computer communication, thanks to its successful content distribution model that connects to developers and users, but which challenges the decentralised architecture of control by Internet, by replacing it with a «fenced garden» under the tenacious control of Apple[1].

However, as far as this article is concerned, the most important is a third aspect concerning the way in which the iPhone is situated in the world that surrounds it.

Between the casing and the crystal screen, along with the processor, the RAM memory and the other standard components of a computer, there is: [1] a GPS receiver that enables the applications to locate the geographical position of the device with an accuracy of tens or hundreds of metres, according to the quality of the signal reception. [2] An accelerometer used to know whether the appliance is moving at any given time, and in what direction. [3] A compass, whereby the makers can know not only where the terminal is exactly at that time or, if when holding it, its user is holding it in a static position or turning

it from side to another, but also if we are facing northwards, eastwards or looking to the south west when looking at the screen. [4] A gyroscope, that enables not only the degree of movement of the telephone to be established, or in which direction it is moving, but also the angle at which we are holding it; if we are holding it vertically and slightly turned towards our right, or if we are holding it horizontally, turned in on itself. The combined data of the accelerometer and the gyroscope tells us how far, how quickly and in what direction the appliance is moving at any given moment. [5] Two video cameras, one facing the user in the front, with VGA resolution and another in the back with a 5 megapixel resolution, capable of recording high resolution video. [6] A microphone in the front, into which the user speaks when the telephone function is activated, but which can also be used to take voice notes or to record sounds in nature.

More than a telephone terminal and more than a handheld computer, an iPhone is an object that is firmly situated in space and in time, as it is aware of its surroundings and capable of adjusting its information processing tasks to contextual circumstances.

Of course, all these sensors that capture movement, orientation and position data, and capable of recording images and sounds

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1   For more on this subject, see Jonathan Zittrain, *The Future of the Internet (and how to stop it)*. Yale University Press, 2008 → http://futureoftheinternet.org/download
Equally important is Cory Doctorow's entry on Boingboing. net: «Why I Won't Buy an Ipad (and think you shouldn't either)» → http://boingboing.net/2010/04/02/why-i-wont-buy-an-ipad-and-think-you-shouldnt-either.html
Even though it refers to the Apple tablet instead of the iPhone, most of the arguments are applicable.

do not exist in a watertight box cut off from the outside. All these data are transmitted by 3G, Bluetooth and WIFI. Sometimes with the knowledge of their user, but sometimes without. On 12 July 2010, Steve Jobs's company admitted, in response to two US members of congress, that to improve the capacities of its products, such as the iPhone or the iPad, they periodically gathered data on the location of their users[2]. The data are stored on the company's servers, which are in theory encrypted and without each specific user being identified. Likewise, the intelligence agencies will no longer need to install a microphone in the house of a suspect to record his conversations: they can remotely activate the headphone of his mobile and record the sounds around him[3].

One month after the launch of the iPhone on 4 June 2010, Apple said that it had sold three million terminals in the United States alone, which was as many as it had been able to manufacture. If we add up those subsequently sold in the rest of the world, the millions of units of previous models with similar capacities, plus the models with similar characteristics of other brands, we can get an idea of the number of sensors that the mobile telephone industry has launched into the world over the last five years. Ready to record, codify and store information in «the cloud», a metaphor that describes

a boom industry and a hidden geography made up by the hundreds of industrial installations that store information on a large scale worldwide[4].

Chris Ware, the cartoonist, captured his version of the mushrooming of these appliances in the social space in a cartoon that appeared on the front cover of the *New Yorker*[5]. On any old night in a street in a US suburb, the neighbours walk along together but without looking at each other. They are all looking at the touch screen that they are holding in their hands and which is lighting up their faces in the dark. They may be texting other neighbours in the digital space, or looking at themselves depicted as a blue ball on a map that indicates where they are in the world at that time. The appliance has already become an instrument to measure reality, a veil placed between us and others.

Know your place

In 1999, a PDF document distributed online, but no-one was sure from where, began to circulate on digital art lists, design and technology websites and on the fringes of the telecommunications industries. It was the *Headmap Manifesto*[6], thirty four pages that consider the deep social implications of the emergence of a new class of personal

2   See «Apple Details Location Data Policy to US Congress», in TechWorld. → http://news.techworld. com/security/3232568/apple-details-location-data-collection-policy-to-us-congress/?olo=rss

3   This technique is known as roving bug; there is evidence that it has been applied for at least five years. See «FBI taps cell phone mic as eavesdropping tool», at Cnet News. → http://news.cnet.com/2100-1029_3-6140191.htm

4   More about «The Cloud» and the data Centre industry in José Luis de Vicente, «Leyendo la Nube: Escenas cotidianas en la era del Big Data». *El Proceso como Paradigma*, LABoral Centro de Arte y Creación Industrial, 2010. → http://www.laboralcentrodearte.org/UserFiles/File/CATALOGOS/elprocesocomoparadigmacat.pdf

5   *The New Yorker*, 2 November 2009. Available at → http://archives.newyorker.com/?i=2009-11-02

6   Ben Russell, *Headmap Manifesto*. Originally available at → http://www.headmap.org Currently (August 2010) available at → http://tecfa.unige.ch/~nova/headmap-manifesto.PDF

technology embodied in appliances that are aware of their location. According to its author, Ben Russell, information technology capable of understanding its specific spatial context will be a breakthrough by definition:

≪Networked culture has yet to articulate itself clearly in spatial terms. The real change happens when networked communities and data manifest in spatial terms. [...] The internet has already started leaking into the real world. Head-map argues that when it gets trully loose the world will be new again≫[7].

In reality, the *Headmap Manifesto* does not offer a cohesive theory or a defined programme that explains how to develop this spatial construction of the network culture. Structured as a collection of fragments, sentences and quotes, its strongest influence is Hakim Bey's well-known *The Temporary Autonomous Zones*, which is repeatedly quoted, along with Umberto Eco, Ted Nelson or Lewis Mumford. Yet the most powerful aspect of the text is likely its catalogue of visions of the everyday, which draws a sketch of this hybrid new world where material and information are related in a new paradigm:

≪Every room has an accessible history / every place has emotional attachments that you can open and save / you can search for sadness in New York / people within a mile of each other who have never met stop what they are doing and organise spontaneously to help with some task or other / in a strange town you knock on the door of someone you don't know and they give you sandwiches / paths compete to offer themselves to you / life flows into inanimate objects / the trees hum advertising jingles / everything in the world, animate and inanimate, abstract and concrete, has thoughts attached≫.

≪Overlaying everything is a whole new invisible layer of annotation. Textual, visual and audible information is available as you get close, as context dictates, or when you ask≫.

≪...what was once the sole preserve of builders, architects and engineers falls into the hands of everyone: the ability to shape and organise the real world and the real space≫[8].

At the start of the 1990s, a researcher at Palo Alto Xerox PARC was working on new ways to relate with the personal computer, which would underpin the evolution of the role of computing in society in the next century. His name was Mark Weiser and he was well-

7   *Headmap Manifesto*, pp. 1–7.

8   *Headmap Manifesto*, pp. 3–4.

known for being kind and a peace lover. His name appears at least twice in the history of digital technological for different reasons.

The first is anecdotal, as he was the drummer of Severe Tire Damage, a garage group whose members were workers from different companies in Silicon Valley and which became the first band in the world to broadcast a concert online in June 1993. The second has even resulted in his own adjective *Weiserian*; a new interaction paradigm that no longer occurs on the desktop, through the keyboard and monitor, and where the user-computer communication does not require our focused and absolute attention.

At a time where the collective imagination and a large part of research into the future of interaction were focused on the discourses of Virtual Reality, Weiser was highly critical of the notions of virtuality and *immersion*. The idea that the only way to navigate a digital space was to invalidate our perception of reality and replace it by a surround simulation was over-simplified and ingenious. «Virtual reality is only a map, not a territory,» he wrote, «that excludes the infinite richness of the universe. Virtual Reality focuses an enormous apparatus on simulating the world rather than on invisibly enhancing the world that already exists»[9].

The notation of invisibility is important in Mark Weiser's work. This best known article, «The Computer for the 21st Century», that has been cited and quoted ad infinitum, summarises in one sentence how the most effective interaction is the least perceptible: «The most profound technologies are those that disappear. The weave themselves into the fabric of everyday life until they are indistinguishable from it». The idea is explained in greater detail in another of his articles, «The World is not a Desktop»:

> «A good tool is an invisible tool. By invisible, I mean that the tool does not intrude on your consciousness; you focus on the task, not on the tool. Eyeglasses are a good tool: you look at the world, not the eyeglasses. The blind man tapping the cane feels the street, not the cane»[10].

Ubiquitous computing and «calm» technology is Weiser's alternative proposal. A setting where the role of the computer is to disappear, or at least dissolve in the space that surrounds us until it is not imposed between us and our needs.

In a Weiserian world, there are literally hundreds of computers in each room, working efficiently but imperceptibly. Identity cards allow the building to know where its inhabitants are exactly and the

9   Mark Weiser, «The Computer for the 21st Century». SciAm 265(3), 1991. pp 94-104. Available at: → http://www.ubiq.com/hypertext/weiser/SciAmDraft3.html

10   Mark Weiser, «The World is not a Desktop». ACM Interactions, 1993. Available at: → http://www.ubiq.com/hypertext/weiser/ACMInteractions2.html

notion of a personal computer is discarded as we can use any of the many screens around the home to access our files immediately. In a Weiserian world, the alarm clock asks you if you want coffee when it rings; and if you do, it switches on the coffee maker; personal data and messages are shown on the windows of the living room, as they are superimposed on the outside view.

In that world, loosing an object is never a problem, as they have labels that can be activated remotely and tell you where they are. In a Weiserian world, our world shows an alternative route on the windscreen to avoid traffic jams and automatically finds free parking spaces.

For everything to work correctly, each object has to know its place in a Weiserian world. And if each object knows its place, it is inevitable that it also knows ours. Weiser was aware of the Orwellian implications of this scenario.

Hundreds of computers in every room, all capable of sensing people near them and linked by high-speed networks, have the potential to make totalitarianism up to now seem like the sheerest anarchy. Just as a workstation on a local-area network can be programmed to intercept messages meant for others, a single robust tab in a room could potentially record everything that happened there.

Locative and augmented

The Headless manifesto played a key role as an ideological programme and inspired a whole generation of artists, designers, programmers and technologists. At the start of the 2000s, a disperse set of stakeholders from different backgrounds took up Russell's challenge to set up the network culture in spatial terms, with it being understood that the evolution of creative and artistic practices in the new media was unavoidable to break down the barriers between digital and physical geographies. As nothing has shape until a label exists, the Riga RIXC centre used the terms «locative media» and «locative arts» for the first time in 2003[11] to refer to a set of digital practices that, unlike the World Wide Web, operate from precise geographical coordinates.

Marc Tuters and Kazys Varnelis pointed out that net.art had been exhausted at the start of the 2000s following the explosion of the dot.com bubble as one of the stimulus for the emergence of locative practices[12]. Other prosaic practices are to do with the availability of increasingly more affordable GPS and PDA (handheld computers) terminals, together with the appearance of third generation of mobile telephones and the huge popularisation of the WIFI wireless networks to access the Internet.

11 See → http://locative.x-i.net/

12 Marc Tuters, Kazys Varnelis. «Beyond Locative Media». Networked Publics, 2006. Available at → http://networkedpublics.org/locative_media/beyond_locative_media

In any event, if we need a means to measure its key position in the digital arts between 2002 and 2010, it is easy to find it in the list of its most important awards. The Ars Electronica Golden Nica, for example, was awarded to the *Can You See Me Now?* localization game in 2003[13], produced by the Blast Theory collective (Interactive Art) and to *NodeRunner*[14], a competition to find WIFI access points in the streets of New York (Net Excellence); In 2005, the award went to Esther Polak and RIXC for *The Milk Project*[15], a GPS reconstruction of the journey of a milk churn through the production chain (Interactive Art); In 2006, the winner was *The Road Movie*, by the Japanese Exonemo[16], a coach tour captured stage by stage by GPS and which can be reconstructed in Google Earth (Interactive Art), and Antoni Abad, the Catalan artist, for *Canal Accesible*[17], the mobile cooperative construction of a map of the architecture barriers of Barcelona (Digital Communities).

Yet technological and art festivals are not the only area where the localisation-based media have a significant impact. Tuters and Varnelis accurately pointed to one of the essential differences between net. art and locative arts. While the pioneers of online art were distancing themselves with a sarcastic and critical attitude of the new «dot com» ideology and economy and clearly strove (sometimes too clearly) to establish the artistic nature of their work, the locative media emerged at a crossroad between artistic practices, technological innovation and business initiative. Artists have no difficulties to work with technological research institutions or with leading companies in the sector, the projects are sometimes seen as prototypes of future products or services; many of the interventions are not fundamentally different from those raised in interaction design studies and laboratories. Some people consider that this lack of distance from industry and commercial agents is proof of the subordination and lack of critical capacity of the new media scene. According to others, it is express recognition that the Society / Technology / Science / Art space finally transcends art institutions and opens up another type of relation.

This does not mean that the Locative Media scene does not recognise affiliations or precedents in the history of art. References, such as the drift technique and the situationist view of the city as subjective geography of memories and emotions, or the shots of nomad cities and mutant megastructures of the utopian architects of the 1960s, are mentioned over and over again. Both resonate in the two most

13 → http://www.blasttheory.co.uk/bt/work_cysmn.html

14 → http://web.archive.org/web/20070317061650/
noderunner.omnistep.com/

15 → http://milkproject.net/

16 → http://exonemo.com/RM/index.html

17 → http://www.megafone.net/BARCELONA

common work strategies in the medium: mapping experience and revealing the invisible.

Producing maps that enable data on the urban space to be forecast and stored that can then be recovered and read is a recurrent methodology. Whether as a resource to recover the collective memory, to create tension between the present of the urban areas and their past, or to construct personal narrations linked and bound to the spaces when they take place. *Urban Tapestries*[18], from the Proboscis studio, is one of the pioneering projects in this direction, a participation platform developed over the decade to insert urban narrations built with fragments of text, video and sound in the urban space. Masaki Fujihata, one of the veterans of Japanese interactive art, develops in *Fieldworks*[19] itineraries where the data from a GPS route is associated with a collection of videos and accounts in the first person, where the citizens explain what certain spaces mean in their biography. The excellent *Biomapping*[20] by Christian Nold takes the idea further, as he uses biometric sensors to record the emotional response of the users as they go along the streets of his city. The geo-localisation of images, videos, sounds and accounts has already become yet another option within the large commercial platforms of the Web 2.0.

In response to the data introduction in the urban space, other artists have worked on developing appliances that reveal the constant presence of information flows to our surroundings; an intangible architecture that has become an integral part of the contemporary city. Michelle Teran, a Canadian living in Berlin, tracks in her *Life: A User's Manual*[21] the radio emissions from wireless surveillance cameras that film contemporary non-places, such as hotel receptions or automatic tellers. The architect Usman Haque creates floating structures that measure the presence of electromagnetic fields (*Sky Ear*[22]), Gordan Savicic developed a harness that exerts pressure on the chest when it detects wireless networks in the surrounding area for his *Constraint City*[23] performance.

As far as the impact of «The Computer for the 21st Century» and the notion of Ubiquitous Computing are concerned, it would be no exaggeration to say that their effect has been felt throughout the industry and an endless number of terms and research spheres. In architecture and urban planning, the concepts of buildings and intelligent cities, and more recently, the emerging discipline of «Urban Informatics». In industrial design, from the notion of «Tangible Media»[24] developed by Hiroshi Ishii in the Media Lab MIT, by

18 → http://urbantapestries.net/

19 → http://www.field-works.net/

20 → http://www.biomapping.net/

21 → http://www.ubermatic.org/life/

22 → http://www.haque.co.uk/skyear/information.html

23 → http://www.yugo.at/equilibre/

24 → http://tangible.media.mit.edu/

creating interaction modes with the digital through everyday objects, to the generic term of Internet of Things.

A field of research and production that is particularly noteworthy is Mixed or Augmented Reality, where technologies are developed that superimpose virtual elements on our perception of the everyday world, as Weiser foresaw. The work of Adrian Cheok[25] at Singapore University has been important, by creating tools and models that have been widely adopted. Diego Diaz and Clara Boj, two artists from our country that have researched the paradigm of Mixed Reality in many works such as *Red Libre Red Visible*[26] trained with him for a time. Julian Oliver, from New Zealand, is probably one of the artists that have most effectively used the resources of Mixed Reality in projects such as *Levelhead*[27], a game where a pair of cubes in our hand seem to contain a whole digital maze inside. Diaz and Boj recently worked with Oliver on *The Artvertiser*[28], an intervention in the public spaces where a pair of binoculars allows us to scan in real time an urban landscape where the advertising billboards have been replaced by works of art.

Frictions

It would be interesting to learn what Ben Russell and Mark Weiser think about iPhone 4, the current situation and the validity of their ideas, one and two decades after they wrote their articles. Unfortunately, that is not possible. In 2005, Russell founded an initiative in the United Kingdom called PLAN[29] (Pervasive and Locative Arts Network) that did not seem to be followed up. A year later, he curated the Futuresonic festival symposium in Manchester, where I meet him briefly. Shortly afterwards, he seems to have abandoned the activity in this scene and at least on the Web, he has vanished into thin air.

Mark Weiser died in April 1999, just six months after he was diagnosed with stomach cancer. He never read the Headmap Manifesto, but most likely it would not have surprised him. In «The Computer for the 21st Century», he said that he was convinced that «what we call ubiquitous computing will gradually emerge as the dominant mode of computer access over the next twenty years».

Has that been the case? The answer is probably more complicated than a straightforward yes or no. Many of his ideas are recognisable in the characteristics of today's interactive services and products.

25 → http://www.adriancheok.info/

26 → http://www.lalalab.org/redvisible/

27 → http://selectparks.net/~julian/levelhead/

28 → http://selectparks.net/~julian/theartvertiser/

29 → http://www.open-plan.org/index.php

From the video games consoles such as Nintendo's Wii and the imminent Microsoft Kinect project, where keys and controls have been replaced by the system's capacity to understand the player's body language, to the Nike Plus service, which automatically registers the exercise patterns of athletes who go out to run, without there being a visible interface. Public infrastructures that are managed and governed by information systems are in the public cycle networks of European cities. And as Weiser dreamt, we have things that are capable of locating themselves, such as the iPhone, through its MobileMe service[30].

But even though many specialists believe we are already living in Ubiquitous Computing, it is not a definitive Weiserian Ubiquitous Computing. In «Yesterday's Tomorrows»[31], Genevieve Bell, the sociologist and director of the Intel Research in Interaction and Experience Department, analyses, along with Paul Dourish, the academic, the huge impact of Weiser's visions when determining the day to day of a whole industry, while she also points out his most important conceptual errors. These problems are summarised by an adjective that is central to the Weiserian vision: «seamless». According to the father of Ubiquitous Computing, the invisibility of interactions between users and systems implied that the communication between them would be harmonious and fluid, with no unforeseen obstacles and behaviours. The users would navigate a world where computers anticipate their desires and would adjust their behaviour efficiently and without any ambiguities. And there would be no frictions in this process.

Yet, any user today of interactive appliances knows that frictions are not an exception in our experience when using them, but a characteristic. Friction between what we expect from an appliance or software and which it offers us; in the interaction between different appliances, protocols and systems, conditioned by opposing political and economic interests. Frictions that range from the struggle to establish what a user can or cannot do within an environment, limited by territorial restrictions, rights management systems or opposing corporate interests. Or from which emerge the huge implications for privacy that lie in the systematic accumulation of data from these appliances.

Above all, finally, friction between the preconceived ideas of the designers regarding the behaviour and intentions of the users, and the specific, complex and unpredictable uniqueness of each of us and our desires and needs.

Compared to the seamless and harmonious uniform universe of Weiser, Bell and

30 → http://www.apple.com/mobileme/features/find-my-iphone.html

31 Paul Dourish, Genevieve Bell. «Yesterday's Tomorrows:Notes on Ubiquitous Computing's Dominant Vision» Personal and Ubiquitous Computing, 11(2), 133-143, 2007. Available at → http://www.dourish.com/publications/2007/BellDourish-YesterdaysTomorrows-PUC.pdf

Dourish, they propose and celebrate and applaud «disorder», embodied in that image of the tangle of cables hidden behind the monitor on our desktop. Given the implementations of fluid and stable services yet, in the end, linear and determinist, they are technologies that have left space for spontaneity, indecision and happy discoveries; for the non-foreseen.

Celebrating disorder in contrast with the efficiency of the invisible means, in the end, defend and applaud.

> «by surprising appropriations of technology for purposes never imagined by their inventors and often radically opposed to them; by widely different social, cultural and legislative interpretations of the goals of technology; by flex, slop, and play»[32].

Preserving and defending this ideological position is not a trivial matter. At a time where technological architecture for the coming decades is being redrawn, and being endowed with increasingly more power and omnipresence to an increasingly smaller number of stakeholders, preserving the collective capacity to improvise may become a fundamental struggle.
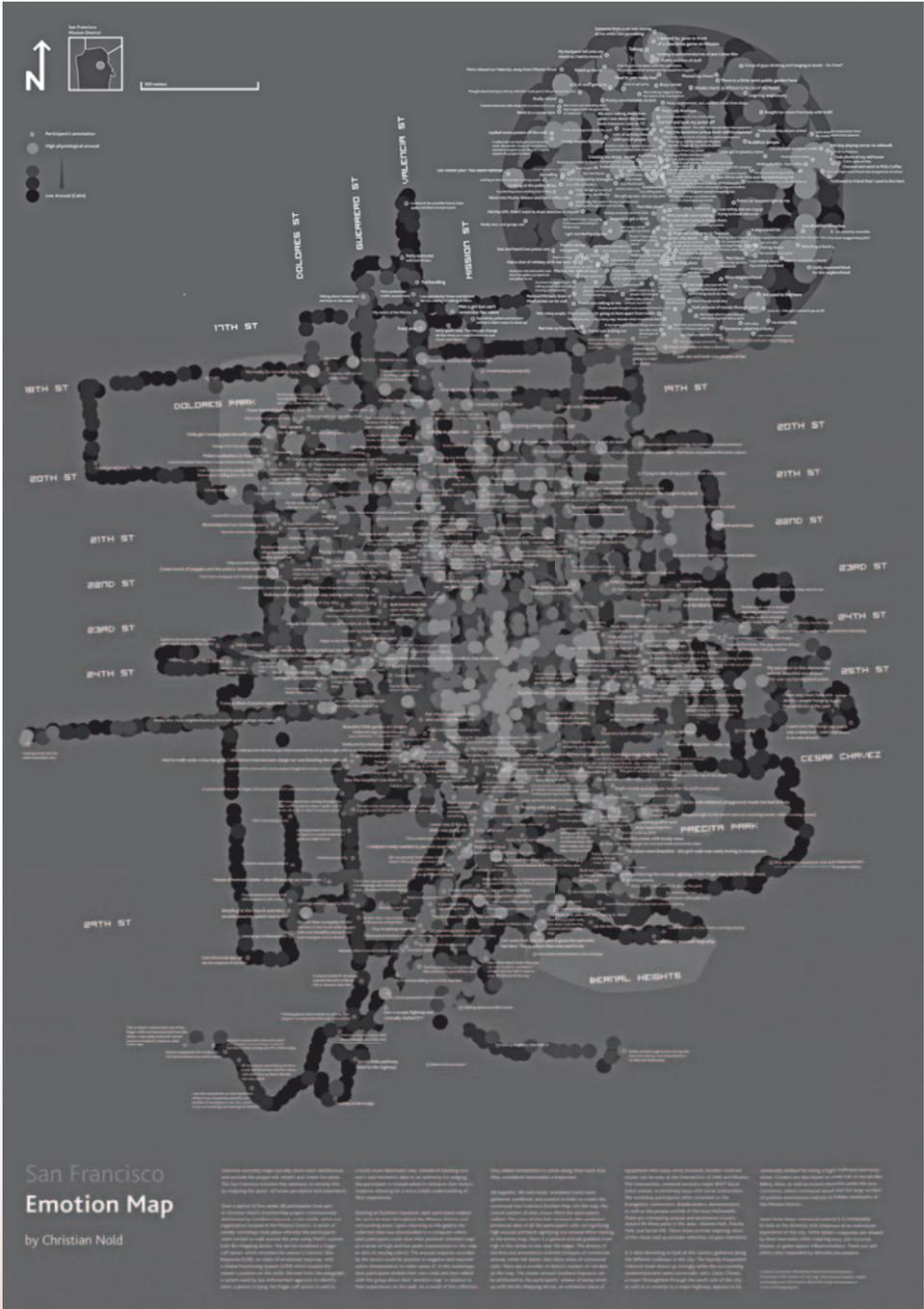
↑ *San Francisco Emotion Map*, Christian Nold.