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http://dave.parsons.edu/projects/1000cellphones
“1000 Cell Phones”
Visualizing Invisible Identities Ideographically

Abstract

Emerging out of an institutional collaboration between Parsons The New School for Design (New York City) and the Academy of Arts and Design at Tsinghua University (Beijing), the mobile media installation, “1000 Cell Phones,” exposes the invisible conversations that constantly occur between the networked devices we carry throughout our nomadic urban daily life. The installation consists of multiple displays that playfully visualize and animate discovered Bluetooth devices within its situated space. Devices are represented as abstract discs in dimensional screen space, colored by transcribing the devices’ unique identifiers to distinctive tone and hue values. This simple but evocative effect emphasizes how an ID number expressed as a one-of-a-kind color not only makes visible a distinguishing feature of our portable networked device, but also reshapes its obfuscated technical datum into an aesthetic and coherent design object. It asks us if this machine identifier expresses our persona and personality, perhaps without our knowledge and complete understanding of the implications. In addition, discovered device names animate across the screens, emphasizing the transient nature of the tracking devices we carry, unwittingly broadcasting a unique identifier for anyone or anything willing to listen. By installing the work in a social space, such as a café or lobby, “1000 Cell Phones” captures the unseen dialogue between mobile phones and laptops broadcasting their Bluetooth identities while owners lurk and socialize. When participants realize how their device names render on the displays, they often engage in the intervention by altering their device settings to affect the textual content on the visualization. In these moments, the conversations between the invisible and visible, technical and aesthetic, surveillance and dissemination, machines and people all become intertwined in a simple but enjoyable expression.

Key Words: mobile, devices, Bluetooth, identity, tracking, surveillance, visualization, installation, ambient findability

Introduction

During the spring of 2008, we created a new installation for that summer’s Synthetic Times 2008 media arts exhibition at the National Art Museum of China, a Cultural Olympics project. A small group of faculty and graduate students at Parsons in New York conceived of a simple interactive installation designed to exploit a feature of mobile devices towards an unexpected and provocative outcome. Our central design question asked if people understood that they might be carrying an electronic beacon that was broadcasting a unique identifier, allowing them to be tracked in physical space. The collaborators wrote custom software to scan for visible Bluetooth devices, gather the information being disseminated, and render the discovered electronic activity as an ambient animation that visualized data poetically. [1]
Design Process

The basic design tools and creative technology were developed in New York at Parsons, including the Bluetooth scanning server and a foundational framework for collecting the data and expressing it visually. The group traveled to Beijing and worked closely with Tsinghua graduate students to design the aesthetic features of the work, including the central feature of transforming the machine identifier number (the Media Access Control (MAC) hardware address expressed in hexadecimal) to a unique color (in red, green, blue (RGB) values also expressed in hexadecimal). (See Figure 4.) In addition, Tsinghua and Parsons students collaborated towards the design of a perspective graphics framework that rendered colored discs representing discovered devices to animate in dimensional space on the video displays, emphasizing the metaphor of being present in physical space with depth to contrast the flatness of the monitors.
Figure 2: Profs. Carroll & Travis discuss design concept at Tsinghua University, Academy of Arts & Design

Figure 3: Final work installed at Synthetic Times 2008, National Art Museum of China, Beijing
Information and Trust

The ideas behind 1000 Cell Phones return to Beijing in the form of this paper which suggest how the project’s design evokes the Icograda Education Network conference theme of xin 信. 信 is an ideographic character which consists of the radical 人 (human being) and the character component 言 (speak, speech, words). Its composite structure signifies “news” and “message.” The Chinese character is based on structural and pictorial parts whose construction method reflects the coexistence principle 和而不同 in the Analects of Confucius. [2] 和 means the approval of variety and respect for unique distinctions. 同 implies the logic of assimilating and merging and restructuring distinctions. Words composed of 信 include 信息 (information), 音信 (message), 信任 (trust), 通信 (communication).

These linguistic structures reflect and illustrate the abstract ideas behind our installation. By exposing some invisible aspects of modern mobile media technology, our international design project succeeds at uncovering a hidden system at play amongst us that reflects our human condition wrought with new challenges to our identity, privacy, security and expressiveness.

Sincerity and Simplicity

When you designate the name of your Bluetooth equipped mobile phone or laptop, this particular name is often referred to as the “friendly name” in contrast to the MAC address, which is also visible to scanners, but is merely a sequence of six pairs of hexadecimal octets. The first three pairs of a MAC address signify the manufacturer and device type while the last three pairs represent the device’s unique number, as determined at the point of manufacture. The MAC address system is essential for networking devices as it ensures that each piece of hardware connected together has an absolute unique identity so that data can be addressed to a specific node and will not collide in anonymous and ambiguous namespace. [3] By allowing owners to choose their own “friendly name,” the designers of the Bluetooth protocol created an opportunity to contrast a human element to a highly machined characteristic.
In many cases, owners of Bluetooth enabled mobile phones or laptops decide to input their given name when asked to name their device when they first configure it, perhaps fresh out of the factory packaging. In this moment, we acknowledge, very literally, that we not only identify with our devices, but also that our devices can serve as a proxy to extend our identity into the electronic and networked realms. Unboxing a new device is a kind of birth to a new semi-sentient electronic being that will take on our own characteristics, starting with a ritualistic naming. Indeed, as McLuhan noted, the media form an extension of our bodies, minds and souls. In the case of Bluetooth, our name, perhaps our most personal attribute can be attached to the portable devices we carry, disseminating to listeners.

When Bluetooth friendly names are exchanged over the discovery or pairing protocol, there is a virtual handshake of sorts, as devices attempt to become acquainted with their respective attributes and capabilities. There is, perhaps, an aspect of sincerity at play during these exchanges, where these portable computers behave with far more agency than “a very elaborate calculating machine” and instead, these computers act more like “human assistants” and “seem to have some intelligence. [They don’t] really. Only the intelligence that we put in [them].”
In that respect, the exchange between these mobile computers is primitive in that the communications are limited to the constraints of the protocol and the illusion that these machines are, in fact, intelligent. However, the exchanges are sincere, in that the purpose of these machine-to-machine conversations are to find people within the local proximity and attempt to connect them together through their communication devices.

The design of the installation takes this primitive but sincere exchange of names a step further by extracting the hexadecimal code from the identification numbers being broadcast and expresses them as unique colors on the display, along with the device name. By revealing your unique color on the ambient displays, the installation is attempting to issue you a compliment: “I have found your unique color and it is a vibrant shade of green that only you possess. That color suits you well.” Indeed, the installation does not speak this text. Maybe a future version should support speech synthesis.

The Primitive and the Urban Nomad

Isn't it remarkable how quickly it became common to observe fellow urban dwellers using modern mobile technology to isolate their primary senses from their environment? Today, in New York City, the nearly ubiquitous white earbuds and handset fixations serve to take New Yorkers’ ears, eyes and sense of touch into their mobile media devices instead of interacting with people. Does this suggest a
preference for introversion or hyper-connection to remote peers rather than feeling fully situated in our current environment?

As an intervention to this condition, *1000 Cell Phones* aims to decorate a transient space, such as a lobby, with its simple and subtle ability to “paint” a dynamic picture using the devices it finds to express color and textual possibilities. The designers of the work intend on people noticing the video displays and interact to discuss it. People notice their name in the display while waiting in the elevator queue. They point, their gesture calling others to notice, and associate the phenomenon with their own mobile device. A familiar user waits in the elevator queue, aware of the piece, changes the Bluetooth friendly name in her phone’s settings. Her expression offers a “social media style” public broadcast message to people in her immediate vicinity. In a subtle but subversive reversal, the mobile device is used in an unexpected way to send a text message to the people around her, rather than the recipients of her normal cell phone communication: her remote and distant social network of friends, family and co-workers.

The installation remains a primitive technological device, especially after observers eventually tune out the work. Dissolving into the background with familiarity, *1000 Cell Phones* steadfastly listens and displays devices, obediently facilitating an invisible conversation between itself and the mobile computers it discovers in its reception zone. When installed at the Sheila Johnson Design Center at Parsons on Fifth Avenue and 13th Street, in Manhattan, during an extended period over 2008 and 2009, the regular visitors of the elevator lobby probably stopped noticing the two extra large flat screen displays that contained the dynamic animation, also visible from the street. It was typical to find students lounging by these street-level windows, laptops open, with their full given names animating in vibrant colors behind them. "ANGELA LEE’S MACBOOK PRO" "KYLE’S BLACKBERRY" "SGH-1220" "SIDEKICK" "OMG YOU B*TCH" "WHAT IS THIS?"
Figure 6: Bluetooth friendly names

Figure 7: Installation at Sheila Johnson Design Center at Parsons The New School for Design
These students, desensitized to the intervention, resume their normalized attention, into their portable computing devices. Laptops and handhelds help them ignore people on the sidewalks, plainly visible through the glass, perhaps glancing back. Parsons students are urban nomads who enjoy their time in the lounge/lobby space through familiarity and convention. When they’re not in the design center’s street level lounge by the elevators, these art and design students migrate around their campus and city, with supplies, computing machinery and personal effects, all in tow. The mobile media installation at Parsons fostered a sense of place for the students who spent time in the lobby. The space responded to their presence and it afforded them a primitive functionality to insert their speech into a situated public display. It commented on the challenges the institution faces in engendering a sense of community within a fragmented campus across scarce real estate in Greenwich Village and in competition with the mobile computers that help us manage an ever growing set of remote social relationships.

A Breath of Bluetooth

When a Bluetooth device “speaks,” its “breath” consists of the radio waves that it emits into an effective radius of about 10 meters. It speaks in the language of the Bluetooth protocols that include digital codes to communicate basic ideas of making introductions, handshaking to become acquainted, sharing capabilities and credentials and, finally, pairing to authorize communication without human permissions. The most intimate form of Bluetooth device pairing is a kind of courtship and mating ritual whereby owners exchange secret codes that grant each device unfettered access. Our futuristic devices communicate on behalf of their owners, negotiating and interrogating each other towards the potential to share information.

When our devices share our information, their collective Bluetooth “breathing” speaks numbers through radio waves, exchanging xin 信. Because 1000 Cell Phones was designed to exhibit internationally, it supports multiple character sets. At the time of this writing, the software supports Latin, Simplified Chinese, Japanese and Korean character sets. Additional language sets can be added to localize the installation to various regions. This multi-linguality is, in itself, expressive speech. The collaborative contributions of aggregated mobile device owners, whose Bluetooth friendly names are set in multiple character sets, paint an expressive canvas, with English, Chinese, Japanese and Korean characters that collide and scurry across the screens. (See Figure 8.) The animations reveal the digital radio conversations occurring around us in many different languages. At least the protocol of Bluetooth provides the common gesture of “breathing” device identity into a unified and codified lingual system among technologies. [6]
Figure 8: Multiple language support

Figure 9: Expressive Speech
Ideographic Interaction

By remaining simplistic and overemphasizing the visual qualities of an invisible dynamic, the images produced by 1000 Cell Phones are basic, abstract and omit detail intentionally. This simplified form amplifies meaning, by focusing on seemingly arbitrary data such as the hardware identification numbers transformed into colored circles, contained within a soft glow around the edges. Color is construed to emphasize uniqueness, especially in aggregate composition of multiple visitors to the space, whose seemingly random color assignments result in a coordinated visual composition. The tonalities and hues offer a surprising reconstitution of machine attributes into a coherent design object.

The Bluetooth device name is rendered inside the colored circle in white type. Other instances of the device name appear arranged in lines, the type set in the matching color of the device's circle, drawing a simple association. As people travel through the space, the colored discs get “pushed” back into the depths of the black monitor space. Usually the colored text remains animating for a few cycles, serving as a residue in the database of transience remembered.

These amplified visual forms metaphorically serve as language agnostic ideographs. Their colors signify uniqueness, exclusive identity, but the textual names suggest expressiveness, creativity, speech and ideas. The interaction of these basic elements constructs an ideographic data-scape of hyper-aesthetic objects that represent language-based speech across human and machine realms. The collisions and overlaps of these linguistic modalities form a loose chain of ideographs, as colored circles and letters arrange themselves on the screen in a kind of self-organizing structure. The coherence of the system emerges through its careful study, and appears random and arbitrary to the casual viewer. This process of learning and discovery feels akin to the native English speaker’s endeavor to learn Chinese. Reading characters seems impossible until a teacher reveals the systemic logic behind the language, and hopefully demonstrates the assembly of radicals and ideographic symbols hidden in the characters.
Communication and Belief

Our data suggest that in New York City and Beijing, a significant cross-section of mobile phone owners carry a Bluetooth equipped product. A critical sub-section of that demographic carries a device that has been configured to be discoverable by Bluetooth protocols. This would either be the case by choice, or because the manufacturer decided to preset Bluetooth visibility as a default state. Many manufacturers, including Apple, design their implementations of Bluetooth to require the owner to actively set the device into its visible mode. These characteristics determined during the design and conception of the electronic product end up in the hands of the consumer, and as 1000 Cell Phones suggests, involves implications for social tracking technologies. Expressed through device traits, owners act as the agents of potential inter-device communication. Again, we consider how the hardware machine address, the MAC number, is somewhat arbitrarily assigned at the factory. This unique ID number serves as an extension of the owner’s identity. Indeed, mobile phone service providers (and others, as 1000 Cell Phones reveals) have the capability to capture this number and associate it with your identity (if you fail to complete that task on your own, by assigning your device friendly name to your given name). All of this communicates something about you, how you interface with your communication technology and its tools and mediums, how you choose to be identifiable or not, by the decisions made in selecting products and configuring services, or by not being aware or concerned with these matters, at all.
In these ways, the ID number is assigned by a higher force, (the handset manufacturer) and serves the function of a kind of DNA code, that allows the device to function in its ecosystem (the Bluetooth ad-hoc mesh network of situated visible devices). The MAC address is the intrinsic encoding that allows devices to communicate, in a manner not unlike how DNA protein sequences determine molecular interactions. The topology of the digital sequences and encodings affords the design of a communication stream, albeit, hexadecimal codes assigned to phone companies or product lines, rather than genomic sequence codes. Through these metaphors and similes, we imagine our mobile device as an extension of our body, with its own genetic makeup determined in a manner well beyond our control.

After the ritual unboxing, the mobile phone starts to inhabit our persona or at least functions as a vessel through which we channel a tremendous amount of our personal energies. Its primary purpose as a personal telephone carries our speech to all corners of society, in nearly all types of situations. It extends our voice in astonishing ways, almost magically, and thanks to some very basic properties, including the assignments of arbitrary codes to our identity: our phone number, the phone’s serial number, the wireless network machine addresses (MAC); it all works as an invisible but highly functional system of assertions that lead to communication.

It is through this speech that we exert our control and command of our device. Through this agency, our beliefs are expressed. The device extends our ability not just to communicate, but also to affirm our beliefs through speech. (Of course, many devices support voice recognition interfaces, but the reference here is rhetorical.) 1000 Cell Phones is designed to notice this endeavor through the filter of listening for Bluetooth protocol activity, and broadcast it through an almost hyper-aesthetic amusement in an attempt to comment upon this shared condition. How did technology so quickly become the primary means by which we identify ourselves, accept our characteristics and capabilities, exert our agency and assert our beliefs?
Figure 11: Detail

Figure 12: Detail
Conclusion

The Bluetooth protocol and the wireless connectivity systems that will eventually replace it are sure to remain crucial social technologies that facilitate human-to-human messaging between devices in close proximity. Indeed, reports suggest that Bluetooth-enabled mobile phones were used recently during the election result unrest in Iran as a last-resort means of disseminating media amongst people when official communication networks had been disabled or restricted for political purposes. [7] Beyond seeing mobile phones as agents of human behavior in close co-proximity, we are also starting to contend with how human behavior will be analyzed and understood on an aggregate scale, thanks to new mobile phone software that helps to visualize our collective movements, communications, associations, actions and, ultimately, our beliefs, building the framework and data-scape for the development of behavior recognition algorithms. [8] 1000 Cell Phones serves as a simple reminder of how this eventual reality will arrive.

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References and Citations


