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DATENSPIEL
DATAPLAY

From critical awareness to emancipation: four workshops led by artists for the citizens of Athens

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ABSTRACT

The paper discusses the need of raising awareness and building modes of empowerment and emancipation in today's data driven metropoleis. It presents the challenges and misconceptions lying behind the constant accumulation and analysis of urban data and it questions the ways these processes progressively tend to define a new condition for the urban environment. While examining whose interests they have come to serve, the paper at the same time claims that possible responses to a call for resistance can derive from art. Four workshops organized in Athens in 2013, led by artists and initiated by the author are discussed as examples .

Keywords
Media art, sentient city, workshops, critical resistance, citizen empowerment, networks.

RESUMEN

El artículo analiza la necesidad de sensibilizar y crear modos de empoderamiento y emancipación ciudadana en las actuales metropolis organizadas en torno a los datos. Presenta los desafíos y las ideas erróneas que se esconden detrás de la constante acumulación y análisis de datos urbanos y cuestiona la manera en que estos procesos tienden progresivamente a definir nuevas condiciones para el entorno urbano.
Al mismo tiempo que analiza a qué intereses sirven estos procesos, este artículo se centra en el arte como lugar desde el que se puede derivar una llamada a la resistencia. Como ejemplo se presentan cuatro talleres desarrollados por artistas organizados en Atenas en 2013.

Palabras Clave
Media art, ciudad sensible, talleres, resistencia crítica, ciudadano, empoderamiento, redes.

1 INTRODUCCIÓN

Contemporary metropoleis are data driven metropoleis. Like contemporary apparatuses, cities today gather and control an amazing wealth of data which is generated by their city inhabitants and it is captured by sensor systems embedded in urban infrastructures. Personal networked devices, fixed and mobile sensors as well as data analytic techniques, have all formed together a new model of a city which functions as a new operating system constantly accumulating and processing data (de Waal 2011). When the wealth of raw data is translated into organized information, valuable knowledge about the citizens, the urban environment and city life itself becomes available. But this of course does not come without a cost; profound asymmetries seem to be lying behind certain questions: *For whom are data captured and processed? Do users/ inhabitants really have access to them? Is it possible to talk about different network architectures that would respectively allow new forms of communication beyond control?*

Today's urban media and most systems of data aggregation, quantification and correlation are supposed to be citizen-centric but this as it is argued by different scholars is hardly the case. Kitchin for instance writes that the embedding of ICT in urban infrastructures in conjunction with the empowerment of the human and social capital only succeeds in opening the way for a new neoriberal ethos while Greenfield similarly underlines that the whole discourse about the 'instrumentation of the urban fabric' happens only for the ease and efficiency of urban management (Kitchin 2013, Greenfield 2013). Cityzentrism implies social consciousness and co-responsibility but yet it leaves certain issues of 'ownership' intact (Schillon 2011, de Waal & de Lange 2012): *Whose city, whose infrastructures, whose data and whose communication are we really talking about?* Time has come, as it is being highlighted by different scholars, to turn attention to the citizens (Hill, 2013), to talk of an 'internet of people' rather than an internet of things (Nold & van Kranenburg) and to discuss 'social cities' instead of smart ones (de Lange & de Waal 2013). It is inhabitants not cities that should be empowered and the question is how.

Starting from these central points, the paper will present the contradictory features and promises of today's data driven cities; it will emphasize the urge for citizens' empowerment and it will discuss if and how art can respond to this. A cluster of four workshops, led by artists and curated by the author in 2013 in Athens will particularly be presented. Paying special attention to the aims, the methodology and the overall outcomes of them, the paper will discuss how such initiatives not only raise awareness but also encourage a substantial understanding and a possible emancipation from centralized networked systems, through a creative and critical engagement with technology.

2 ADDRESSING THE ISSUE: THE PLAYFUL FACE OF AN OBFUSCATED APPARATUS

Fundamental misconceptions seem to be lying at the heart of today's networked metropoleis which are intensified by the continuous advance of urban media and networked systems. When trees are tagged, buses tweet, traffic sensors keep a score and transportation systems reward passengers for their daily itineraries, the city looks playful, enjoyable and easier to move around. At the same time however, the fact that changes in the urban environment can be constantly captured and citizens' moves can be tracked opens the way for a new mode of contemporary city life which can be regulated and predicted. New forms of control, politicization and responsabilisation emerge in a city that records and remembers everything leaving little room

for spontaneous encounters and interactions (Iveson 2011; Greenfield 2013). Furthermore, as buildings, cars, infrastructures and public utilities get networked, not much of a choice is left to citizens. When not only a more enjoyable but also a more efficient, healthier and safer life is promised to citizens, they respectively easily submit to the agency of the software. This is how the contemporary metropolis, based on a network of networks, functions as an apparatus of apparatuses, following Agamben's description of an apparatus, which gains more and more the capacity 'to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions or discourses of living beings' (Agamben 2009). But how perceptible are these processes of the apparatus to the city inhabitants?

Although the innumerous networked sensors and devices found in the city environment enhance the visibility and identification of actions, moves and changes taking place within it, at the same time the very opposite is the case for technology itself. Based on the anonymisation of algorithmic control and on processing mechanisms which are soft (Rossiter & Zehle 2013), the ubiquitous and networked systems used allow their mechanisms to remain invisible or obscure. The contemporary city, assisted by the 'technological unconscious' (Clough 2000; Thrift 2005), playful, vivid and active as it might be, it is also simultaneously based on the logic of blackboxing, leaving its internal complexity unknown (Latour 1999). And this goes not only for the processes of data but also for the topologies of the multiple networks expanding in the city and for the architecture of an urban data body which remains uncanny and unknown. Little can the 'space of flows' therefore, as Castells had called it (2000), be perceived it by the connected city inhabitants.

Networks should be made visible, computerized systems should become transparent and technologies should be made responsive and available Saskia Sassen claims as a response to the above points (Sassen). Then, the city would become literally a publicly shared domain or as de Waal and de Lange similarly argue, the flows of data circulating within the city would become the new commons which would be owned by all (de Lange & de Waal 2012) . This form of ownership would mean then that citizens would have the right to act upon issues concerning them while it would also reflect a sense of belonging and a willingness to share, summarized also as a right to appropriate to follow Lefebvre . (1999) And this, as de Lange and de Waal clarify, demands a stance for collective engagement and action (2012). *But what does it take for this change to happen? How could citizens / users regain control? Would fundamental understanding and emancipation from the current centralized architectures and controlled flows be possible?*

3 THE DATENSPIEL/ DATAPLAY PROJECT: METHODS AND APPROACHES FOR THE CITIZENS' EMPOWERMENT, EMANCIPATION AND RESISTANCE

Citizens' empowerment, as it becomes clear, does not depend on their being equipped with networked devices or on the urban data that governments and companies decide to make available. A possible emancipation, respectively, cannot derive simply from crowdsourcing practices, from citizens taking responsibility for their cities. A substantial change that would reverse the present asymmetries can only happen if citizens get the opportunity to understand to the greatest extent possible how the mechanisms and processes lying behind connectivity and data collection function. As Greenfield writes, although "there is tendency to universal surveillance and control latent in the design of these [new] tools, … there's at the same time an

equally strong tendency in them to the decentralization and distribution of knowledge of the world, which we can grasp hold of, reinforce and make use of if we choose to." (Newitz 2014)

Taking these elements into consideration, Datenspiel wished to examine today's data cities as complex systems, as networks of networks which just as they might constitute apparatuses of surveillance and control, they can equally become the ground for emerging modes of communicating, being and sharing. Looking into the fundamental notions and architectures of the networks on one hand and the materiality of technological devices and infrastructures on the other, its aim was to open the 'black box' of today's cities and to allow counter–mechanisms to be put into action. The name of the event, 'datenspiel/ dataplay', was purposefully chosen for the ambiguous meaning it conveys; it expresses on one hand the infinite game of data among companies, governments and citizens and on the other the possibilities for its unpredictable, yet radical, reversal. The four different hands-on workshops organized, as it will be explained below, attempted to 'game' the city in order to provide citizens with tools that would assist in the disruption of the current practices, in the re-appropriation of the circulation of data and ultimately in the emancipation from centralized and controlled modes of communication. Using free and open source software, low-cost materials and innovative creativity, participants -in collaboration with the artists- were invited to develop prototypes and test them in the urban environment.

For every workshop, the thematic context, the reference to his artist's work, the aims and outcomes are outlined. All workshops had a team of 10 – 15 participants, most of them being artists and architects, who applied after an open call for participation.

3.1 Covert Computing with Julian Oliver

Covert Computing (Fig.1), a workshop designed and run by Julian Oliver aimed to tackle issues of trust in a time period where objects have imperceptible properties serving purposes unknown to their users. It addressed a new condition conquered by network insecurity as embedded sensors and microcomputers render the environment measurable, detectable and regulated beyond citizens control. Considering how objects today become 'addressable, aware and active' (Kitchin & Dodge 2011), how they are 'weaponised' (Appelbaum) and they succeed in 'conditioning existence' (ibid), the artist invited participants to 'get some of this power back' and re-purpose it.

Figura 1. Covert Computing. Photo taken by Theodoros Papatheodorou. CC BY-NC-SA 2.0

Reflecting and developing further aspects of different works of the artist, such as the *Transparency Grenade*[1], a microcomputer hidden under an ironically beautiful granade which could anonymously capture data and network traffic, the *Flamer*[2], an infected USB stick shaped as a dangerous little weapon which could infect a windows run computer or *Newstweek*[3], a device built into a plug which would allow online news manipulation, *Covert Computing* embraced tactics of playful object camouflage for data circulation within an offline network.

The workshop explored methods and materials which could be used for building and empowering hidden networks and communication in the private or public space. Using inexpensive computers and found ubiquitous objects that the participants brought, tactical weapons of communication were created which could connect to one another and hack information transmitted through other networks. To achieve the formation of this network of objects that varied from smoke detectors to tobacco cases and from fake flowers to books, participants first and foremost had to learn how networks work, how data are transmitted and what the main concerns of centralization and cloud computing are. Then they learned how microcomputers/routers through basic commands could be adjusted, modified and personalized in order to permit communication and sharing of files.

Turning harmless looking objects into powerful devices that could capture data and route traffic, participants got to know not only how networks work but also how to create and use their own networks for different needs in the future. Opposing the automated continuous machinic collection of data by objects with sensors found within today's cities, these objects counter-proposed tactical means of communication that cannot be impeded by third parties and interests.

3.2 Netless with Danja Vasiliev

The Netless workshop (Fig.2) was a collective experiment for a grassroots communication network which takes advantage of a city's transportation infrastructure and the movement of the city inhabitants. In a period when, as mentioned above, all information exchange is logged, data circulating in the city is not secure and anonymisation is no longer an option, this initiative was a proposal for reconsideration and change.

Figura 2. Netless. Photo taken by Angeliki Hatzi CC BY-NC-SA 2.0

The workshop was part of an ongoing research project of the artist on the topic[4]. The basic idea behind it, is that an offline network can be formed by communication nodes which are either attached to transportation vehicles or carried by inhabitants while moving within the urban environment. When the nodes meet, a short-range wireless anonymous communication session is established and information is exchanged without being logged. Proposed as a tactical communication platform and not as a social networking service, Netless is a based on the idea of short messages which can spread as a virus, rendering the content of the message more important than the person behind it. Danja Vasiliev started developing *Netless* back in 2010 during a residency in the HTTP Gallery in London. A full table-sized model installation of it was built and exhibited at Transmediale 12 in Berlin and in Athens *Netless* was really tried out at the streets of the city.

The group of participants that joined this workshop firstly learned how to build their own *netless* nodes by breaking open a model of an inexpensive router, modifying it and adding the necessary components. Then, they were invited to understand the open and expanding topology of a 'star' network in relation to the fixed topography of the particular urban area where the experiment would be developed. To realise the experiment, an interesting methodology was followed. Users were becoming themselves the 'nodes' of the network carrying the devices that transmitted and received information. Different walking tactics had to be used and several paths had to be taken with the goal to realize the possibilities and limitations of their communication network.

Inviting users to send messages that need to concern the many and asking them to seek for other nodes in order to circulate information, the workshop embraced a collaborative and participatory character that proved to be playful and radical at the same time. *Netless* as a counter-proposal addressed interestingly the social and the informational, the machinic and the human. If "mesh networks are the technical analogue side to human trust networks" as von Kraneburg has put it (2011), then the creator of *Netless* as he says himself aimed to create " a hybrid (parasitic) system, which requires the 'human' as resource in order to function" (Garrett 2010). As data processing and error correction routines were outsourced to the users who also defined the network's architecture and owned its technology, not much was left out of their control.

3.3 City CPU Mapping with Gordan Savicic

City CPU mapping (Fig.3) aimed to create a cartography of a central area of Athens based on the decisions and choices of its inhabitants. In an era that online maps and location based social networking sites, offer more and more personalized geo-information connected to the rating and ranking of search engines, City CPU attempted something different; it aimed to capture the city's data body allowing the human to surpass the machinic and to reflect the outcomes of collective effort rather than those of algorithms. The main question addressed therefore was: Who defines today what kind of data are mapped? Whose image of the city is really captured and what would users map if they could define the layers, the categories and the entries? How can trust be regained in geospatial data and cartography?

The workshop followed a series of projects of the artist under a relevant theme. As the title itself suggests, with the Central Processing Unit reference, cities such as those of Basel, Shenzhen and Aarhus, have been captured as if they were a computer mainboard diagram, as if the city had to be grasped as an information system. It

Figure 3: City CPU Mapping. Photo taken by Gordan Savicic CC BY-NC-SA 2.0

claims that residential or commercial areas must now be related not only in relation to their natural and urban contexts, but also to their integration of network interfaces.

Participants in the *City CPU mapping* workshop learned how to use online-mapping tools in order to create new narrations between the city itself and its data body. In this context, they were invited to discuss early examples of cartographic visualizations as well as contemporary mapping tools while addressing the following question: What data can possibly be fetched and read out directly from the streets and how does it differ to pure statistical data? Through thorough discussion, the team decided what to map, taking as the center and their starting point the venue of the workshop. Using the platform of the Open Street Map, their smart phones and basic analog annotation tools, like a pen and printed version of the OSM, they went out at the streets of the city and developed a grassroots cartography. Wifi networks, GSMs networks, cell tower locations as well as graffiti, benches, obstacles, trash bins, points of view towards the Acropolis monument and other unexpected data was collected and mapped. Sensors were also used, enriching the cartography, based on the participants decisions about why and when it would make sense to map sound, air pollution or movement.

Deciding not only about the categories, the measurements and the data captured but also about the different layers, the different colors and the location markers used, the participatns gave birth to a playful and creative cartography which goes beyond the usual, expected and recognizable aesthetics and patters of the online mapping platforms we are used to.

3.3 Electromagnetic Cityscapes with Sabrina Basten and Audrey Samson

The Electromagnetic Cityscapes workshop addressed the intangible nature of networked connectivity and explored the impact that the electromagnetic spectrum can have on citizens' movements. With the increasing prevalence of WiFi, RFID, Bluetooth and other novel radio technologies, as Fuller and Harvey argue, a new kind of electromagnetic space is becoming integral to the urban life and environment which demands a new reconsideration between radio,

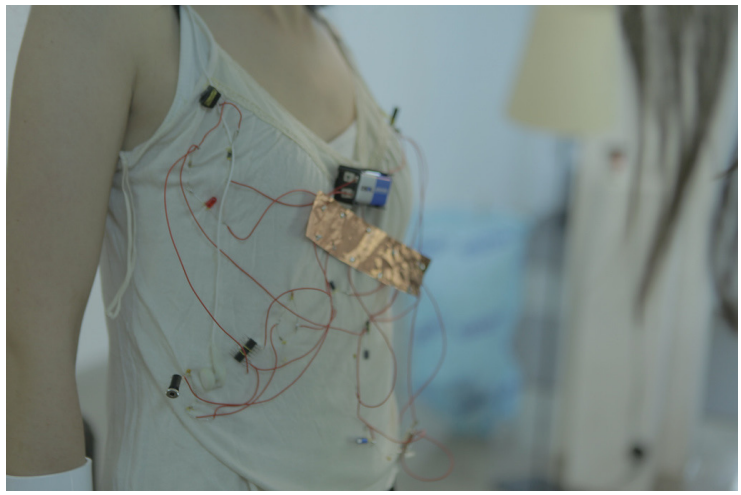

Figure 4. Electromagnetic Cityscapes. Photo taken by by Angeliki Hatzi CC BY-NC-SA 2.0

urbanism and architecture (2011). And while citizens might not directly feel this, yet these new power relationships, affect how they move and act. But how can citizens sense the un-senseable and how can they detect those subtle imperceptible waves that are unseen and uncanny?

The aim of the *Electromagnetic Cityscapes* workshop was to render a city's electrosmog discernible while demystifying the role of fast evolving technology at the same time. More particularly, the scope was to create audible electromagnetic walks based on detectors formed by old electronic devices. The particles of old radios, TVs, VHS players, mobiles, tape recorders for instance were used to create detectors which functioned as antennas and allowed the body to physically feel the flows and waves of the networked world. This way not only the electromagnetic smog can be sensed but also a comment on the commodified tech world is made.

The workshop participants learned how to break things open, how to study their circuits and coils and how to recycle those purposefully in order to experiment with them in the city. The methodology used described by the artists as "playful and non hierarchical" invited participants to use their skills and interests freely, openly and in a collaborative way. "We are not experts, we are just playing around and we impart our enthusiasm for discovery. Participants in the workshop work together, helping each other, figuring it out together." (Basten & Samson 2011) The workshop has been hosted in different cities and the objects designed in every workshop vary just like the experience of the city itself. Playful objects, objects in disguise succeeded in changing the way citizens move in the city as they were orientated no longer by where they wished to go but rather by what they would hear.

The workshop highlighted that new perceptions, new movements and new interactions are possible through 're-incarnated objects', which in a playful and creative way can raise awareness about the networked environment and"how companies fool around with us", underlining how "we have to take back that power through understanding our world around us and to use our own hands." (ibid) In this case, emancipation and empowerment is found not only in understanding how things work, and in exploring how the surrounding is being affected but also in realizing how the imposition of needs and desires by the companies can be stopped.

4 DISCUSSION - CONCLUSION

The four workshops discussed above share distinctive features that could be summarized as it follows in order to draw some conclusions about the role that art can play in a need for change in the data-driven world.

Firstly, all workshops opposed the 'blackboxing' of today's networked systems and technologies. Participants engaged with the materiality of the devices, the systems and their components. Breaking things open and re-purposing or modifying them equipped participants with the knowledge and confidence of what they really had at hand.

Secondly, the tools, systems and devices that they modified and built became their 'own', following an inclusive rather than exclusive sense of ownership which also embraces sharing. This second element is closely connected to the first one. As Vasiliev and Oliver characteristically claim "The right to deconstruct, modify and ruin are rights that come with ownership" (2013) and if companies do not allow users these rights, then these need to be reclaimed from the start.

Thirdly, all workshops turned back to the human element, to the important contribution of the citizen/ the user. The deep understanding of how networks, systems and infrastructures work allowed users to build prototypes coded by them opposing the automation of machinic algorithmic control.

Fourthly, for all workshops only open source or free software was used in order to support the new ethic of sharing, contributing, of thinking and working together.

Fifthly, workshop embraced playfulness, or more accurately a feeling of playful cleverness as Stallman has put it for activities that have a hack value. Objects in disguise and game-like tactics were part of the artists' methodology. Using anonymity and invisibility, just like the algorithmic actors ruling networked centralized systems do, the tools, platforms and devices developed, tried to give back to the users the some of the power that was lost.

Revealing how networked systems work, demystifying them and fighting the misconceptions around them, the four workshops discussed are proposed to be considered as steps towards the substantial empowerment and emancipation of users from a centralized and controlled connectivity which is conditioning everyday life. In a period when possible modes of resistance against the constant data aggregation, quantification and analysis are at the center of every discussion, different systems need to be created, shared and supported that will be owned and controlled by the many rather than the few. For this to happen, citizens should not just have access to data or assist in the collection of data; they need to know how systems work and also find ways to collaborate and act collectively. This is a part where art can play a significant role. 'We must shift attention from technologies that seamlessly blend in with everyday life, towards technologies that move people and enable them to move others' de Lange writes and workshops like the ones of Datenspiel had this scope in mind; to invite people to learn, to build networks together and to use this knowledge in the future while inviting others to join them (de Lange 2013). The artistic voice of the people, might still be the voice of the people to come (Ranciere 2014) building new bonds based on sharing skills, knowledge and affect.

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References

Agamben, G. (2009). *What is an Apparatus and Other Essays*. Stanford: Stanford University Press

Appelbaum, J. (2014). *Keynote at Transmediale 14. Art as Evidence*. Accesed from https://www.youtube.com/watch?v=ndx0eox0Lkg

Basten, S., Samson, A, (2011). Hackin' some coils into wearables. Accesed from http://www.body-pixel.com/2011/08/09/interview-with-sabrina-basten-audrey-samson-part-1-hackin-some-coils-into-wearables/

Castells, M. (2000). *The Rise of the Network Society* (pp 407). Malden-Oxford-Victoria: Blackwell Publishing,

Clough, P. (2000). *Auto Affection: Unconscious Thought in the Age of Tele-Technology*. Minneapolis: University of Minnesota Press.

Fuller, G., Harley, R., (2011). The Protocological Surround: Reconceptualising Ratio and Architecture in the Ratio City. In Foth, M., Forlano, L., Satchell, C., Gibbs, M.(eds*) From Social Butterfly to Engaged Citizen*. (pp 39 – 54). Cambridge/London: MIT Press

Garret, M .(2010). *An interview with Danja Vasiliev*. Accesed from http://www.furtherfield.org/interviews/interview-danja-vasiliev

Greenfield, A. (2013). *Against the Smart City*. (kindle edition) New York City: Do Projects

Hill, D. (2013). *On the smart city; Or, a 'manifesto' for smart citizens instead.* Accesed from http://www.cityofsound.com/blog/2013/02/on-the-smart-city-a-call-for-smart-citizens-instead.html

Iveson, K. (2011). Mobile Media and the Strategies of Urban Citizenship: Control, Responsabilisation and Politicisation. In Foth, M., Forlano, L. Satchell, C., Gibbs, M.(eds) *From Social Butterfly to Engaged Citizen* (pp 57 – 70). Cambridge/ London: MIT Press

Kitchin, R. (2013). *The Real Time City: Big Data and Smart Urbanism in 'Smart Urbanism: Utopian Vision or False Dawn workshop*, University of Durham. Accesed from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2289141.

Kitchin, R., Dodge, M., (2011). *Code/Space, Software and Everyday Life.* Cambridge/London: The MIT Press

Lefebvre H, (1996). The right to the city. In Kofman, E. and Lebas, E. (eds.) *Writings on Cities* (pp 147–159) Oxford: Blackwell

De Lange, M., de Waal, M., (2012). *Ownership in the Hybrid City*. Rotterdam: Virtueel Platform Research

De Lange, M, de Waal, M, (2013). Owning the City: New media and citizen engagement in urban design in *First Monday* Vol 18. N. 11-4. Accesed from http://firstmonday.org/ojs/index.php/fm/article/view/4954/3786#p2

De Lange, M., (2013). The Smart City you Love to Hate: Exploring the role of affect in Hybrid Urbanism. In Chartitos, D., Theona, I., Dragona, D., Rizopoulos, H., *Subtle Revolutions Proceedings of the 2nd International Hybric City Connference* , pp77-84 URIAC, Athens

Latour, B. (1999). *Pandora's hope: essays on the reality of science studies*. Harvard Universoity Press, Cambridge Massachusetts

Newitz, A. (2014). *The Dark Side of the Smart City. Accesed from* http://io9.com/the-dark-side-of-the-smart-city-1512608758

Nold, C., van Kranenburg, R., (2011). *The Internet of People for a Post-Oil World in Situated Technologies Pamphlets 8* (p 45). The Architectural League, New York

Oliver, J., Vasiliev, D., (2014) *Critical exploits. Accesed from* https://www.youtube.com/watch?v=v8IlNpefM6s

Ranciere, J. (2009). *The emancipated Spectator.* London: Verso

Rossiter, N, Zehle, S. (2013). *Toward a Politics of Anonymity: Algorithmic Actors in the Constitution of Collective Agency.* Accesed from http://nedrossiter.org/?p=360

Sassen, S. T*alking back to your intelligent city. Accesed from* http://voices.mckinseyonsociety.com/talking-back-to-your-intelligent-city/

Schillon, P. (2011). *On Cityzentrism: Thinkers and doers among* the digital layers of the sentient city. From Living Labs to Hackathons and City Hackers. Accesed from http://urban360.me/2011/11/22/on-cityzentrism-thinkers-and-doers-amongst-the-digital-layers-of-the-sentient-city-from-living-labs-to-hackhatons-and-city-hackers/

Stallman, R., ***On Hacking*****.** Accesed from https://stallman.org/articles/on-hacking.html

Thrift, N. (2005). *Knowing Capitalism*. London: SAGE

De Waal, M. (2011). The ideas and ideals of social media. In Foth, M., Forlano, L., Satchell, C., Gibbs, M.(eds) *From Social Butterfly to Engaged Citizen* (pp 5 – 20). Cambridge/London: MIT Press

NOTAS

1. http://transparencygrenade.com/
2. http://julianoliver.com/output/flamer
3. http://newstweek.com/
4. http://k0a1a.net/netless/