OFFICINA*

ISSN 2532-1218 n. 19, ottobre-novembre-dicembre 2017 Aria

19

Emotional landscape, paper collage (2016)
di Patrizio Martinelli
Visiting Assistant Professor, Department of Architecture+Interior Design, College of Creative Arts, Miami University, Oxford (OH), USA

"Il collage e il montaggio sono le tecniche di rappresentazione artistica preferite, nel nostro tempo; questi media permettono una densità archeologica e una narrazione non lineare grazie alla frammentazione di immagini derivanti da origini inconciliabili. Il collage rinvigorisce l'esperienza della tattilità e del tempo". *Juhani Pallasmaa, "Hapticity and Time: Notes on Fragile Architecture", in The Architectural Review, n. 80, 2000, traduzione di PM Martinelli.*

patriziomartinelli.tumblr.com

Lo sguardo oltre il cielo

Nel 1610 Galileo Galilei dà alle stampe il *Sidereus Nuncius*, un trattato di astronomia nelle cui poche pagine espone i risultati delle osservazioni condotte con il nuovo strumento da lui inventato: il telescopio. Il trattato, uno tra i primi a presentare in forma scientifica gli esiti di una ricerca, inizia con uno studio sulla Luna nel quale Galilei dimostra, attraverso l'osservazione delle ombre, che la superficie lunare non è affatto liscia e levigata ma "scabra e ineguale, e allo stesso modo della faccia della Terra, presentasi ricoperta in ogni parte di grandi prominenze, di profonde valli e di anfratti". Il testo continua con una trattazione inerente le stelle fisse della Via Lattea in cui lo scienziato va a dimostrare che queste sono ben più numerose di quanto siano quelle visibili a occhio nudo, dilatando in tal modo le dimensioni del cosmo fino a limiti prima impensabili. Infine vengono descritte quattro stelle mobili mai prima osservate, i quattro satelliti di Giove: Io, Europa, Ganimede e Callisto. La scoperta è così sensazionale da spingere lo stesso Galilei a nominare i quattro satelliti come Astri Medicei, in onore del Serenissimo Granduca di Toscana Cosimo II De' Medici, suo mecenate.

Con questa scoperta Galilei dà il definitivo colpo di coda all'antropocentrismo, dando avvio a secoli di investigazioni sull'universo e sulla possibilità di andare oltre confini del nostro cielo. Dopo più di quattro secoli l'uomo ha fatto enormi passi avanti in questa direzione, arrivando a mettere piede sulla Luna, a spedire sonde e telescopi nello spazio e a scoprire miliardi di stelle e pianeti che ruotano attorno a esse. Il cielo è diventato la nuova frontiera dell'Umanità: l'uomo traccia in esso rotte aeree, sfrutta la forza dei venti e, sfidando la gravità, costruisce edifici sempre più alti che si stagliano sull'orizzonte; l'atmosfera è diventata il ricettacolo di tutti i nostri scarti e così l'uomo si spinge oltre i suoi limiti per cercare nuove terre e nuovi mondi da abitare. E questa spinta in altezza si fa più forte mano a mano che la "coscienza planetaria" descritta da Gilles Clement in *L'alternativa Ambiente* (Quodlibet, 2015) va rafforzandosi, mettendo l'Umanità di fronte al degrado e al declino che l'uso inconsapevole del nostro pianeta Terra sta provocando. Dopo secoli di guerre e battaglie per il dominio della terra, l'Umanità sta scoprendo che il vero nemico da cui difendersi è dentro di lei, che il suo passato non è stato poi tanto glorioso quanto ci raccontano le stelle con i loro appellativi e che il futuro che l'aspetta è incerto. L'Umanità ora comincia a chiedersi come porre fine a questo conflitto tra uomo e natura, e così alza gli occhi al cielo e tende l'orecchio, alla ricerca di una flebile risposta che forse, per dirla alla Bob Dylan, sta già "soffiando nel vento". *Emilio Antoniol*

Stefania Mangini

Direttore editoriale Emilio Antoniol
Direttore artistico Margherita Ferrari
Comitato scientifico Fabio Cian (*direttore*), Sebastiano Baggio, Matteo Basso, Maria Antonia Barucco, Viola Bertini, Piero Campalani, Federico Dallo, Doriana Dal Palù, Francesco Ferrari, Michele Gaspari, Silvia Gasparotto, Giovanni Graziani, Michele Marchi, Patrizio Martinelli, Cristiana Mattioli, Corinna Nicosia, Fabio Ratto Trabucco, Chiara Scarpitti, Giulia Setti, Luca Velo, Barbara Villa, Carlo Zanchetta, Paola Zanotto
Redazione Valentina Manfè (*esplorare*), Margherita Ferrari (*portfolio*), Paolo Borin (*BIMnotes*), Francesca Guidolin (*microfono acceso*), Libreria Marco Polo (*cellulosa*)
Copy editor Emilio Antoniol (*caposervizio*), Luca Casagrande, Margherita Ferrari
Impaginazione Margherita Ferrari
Grafica Stefania Mangini, Luca Casagrande
Photo editor Letizia Goretti
Testi inglesi Giorgia Favero, Antonio Sarpato
Web e social media Emilio Antoniol, Luca Casagrande, Margherita Ferrari
Progetto grafico Margherita Ferrari

Proprietario Associazione Culturale OFFICINA*
e-mail info@officina-artec.com
Editore Incipit Editore S.r.l.
Sede legale via Asolo 12, Conegliano, Treviso
e-mail editore@incipiteditore.it

Stampa Press Up, Roma
Tiratura 300 copie

Chiuso in redazione il 20 novembre 2017, con tante crostatine al cioccolato

Direttore responsabile Emilio Antoniol
Registrazione Tribunale di Treviso
n. 245 del 16 marzo 2017
Pubblicazione a stampa ISSN 2532-1218
Pubblicazione online ISSN 2384-9029

Accessibilità dei contenuti
online www.officina-artec.com

Abbonamenti
e-mail abbonamenti@incipiteditore.it
online www.incipiteditore.it

Prezzo di copertina 10,00 €

OFFICINA*

"Officina mi piace molto, consideratemi pure dei vostri"
Italo Calvino, lettera a Francesco Leonetti, 1953

Trimestrale di architettura e tecnologia
N.19 ott-dic 2017
Aria

HANNO COLLABORATO A QUESTO NUMERO:
Loris Agostinetto, ANEV, Eduardo Bassolino, Maurizio Brocato, Lorenzo Catania, Massimiliano Condotta, Valentina Crupi, Marcello Fantuz, Margherita Ferrucci, Paola Fortuna, Tiziana Gallon, Beatrice Lerma, Michele Manigrasso, Patrizio Martinelli, Angela Mejorin, William Miranda, Daniele Passoni, Matilde Pedroni, Fabio Peron, Maura Polesello, Giovanni Riva, Paolo Ruggeri, Chiara Scanagatta, Francesco Scarpati.

INDICE n·19·ott·dic·2017

OFFICINA*

Emotional landscape, paper collage (2016)
Patrizio Martinelli

Massimiliano Condotta is assistant professor in Architectural Technology at Università Iuav di Venezia.
e-mail: condotta@iuav.it
Paolo Ruggeri, PhD in Industrial Engineering curriculum Technical Physics at University of Padua.
e-mail: pruggeri@iuav.it
Chiara Scanagatta is a PhD student in New Technologies for the Landscape, the City and the Environment at Università Iuav di Venezia.
e-mail: c.scanagatta@stud.iuav.it

The LOOPER project in South Verona

Air quality participatory data collection towards co-design of mitigation measures in urban areas

IMMAGINI
01 - The case study area of South Verona framed inside the city.
02 - Passive sampler cross section. Credits: Stefania Mangini.
03, 04 - Low cost acoustic level monitoring system. Prototype by: FisTec-Università Iuav di Venezia.
05 - Example of possible sample placement. The actual placement will be decided by citizens during the Urban Living Lab meetings.

L'inquinamento atmosferico è un fenomeno dovuto a molteplici fattori, e l'osservazione e la misurazione dell'inquinamento di un elemento trasparente, mobile ed etereo come l'aria è assai difficile.
Spesso la condizione percepita dagli abitanti non coincide con le reali condizioni di inquinamento atmosferico, appunto perché essa è condizionata da molti altri fattori come il rumore o la presenza o assenza di elementi naturali. A partire da queste posizioni contrapposte è difficile individuare e attuare soluzioni di mitigazione valide e allo stesso tempo condivise per affrontare il problema dell'inquinamento urbano. Il presente articolo illustra le strategie messe in atto dal progetto di ricerca europeo LOOPER (Learning Loops in the Public Realm) e la sua applicazione al caso di Verona Sud. L'obiettivo del progetto è di costruire una metodologia e una piattaforma di co-creazione - basata su informazioni della qualità dell'aria derivate da processi di misurazione partecipata - al fine di migliorare i processi e gli interventi di trasformazione dell'ambiente costruito.

> The wind blows wherever it pleases. You hear its sound, but you cannot tell where it comes from or where it is going. So it is with everyone born of the Spirit" (John 3,8).

Air quality and urban space

We have chosen to start with this sentence of the *New Testament* for two reasons. The first is to underline the absolute relevance of the element "air", considered by many religious as divine element (the Hebraic term *ruah* that means "breath", "air", "wind" is used in the *Ancient Testament* as "Spirit"). The second reason is to introduce a characteristic of the air: its ethereal condition, its being perceived as immaterial; nearly to be sometimes considered as non-existent. Understanding and perceiving the level of pollution of the air is quite difficult; but, even if we cannot see it, air is still something material and tangible, of vital importance, but also a vector of pollution and noise. Air quality of urban environment is therefore something everyone should be concerned about because it can affect people's health and lifestyle, and with air quality we refer both at gas and particulates pollutant but also at noise often identified as a forgotten pollutant. Recently is increasingly being used the term "soundscape"[1] (Southworth, 1969) at demonstration that urban noise is now recognized as an environmental and public health issue that needs to be addressed in correlation with air pollution.

Unfortunately, in most cities - that already suffer of pollution due to their geographical location - nuisance and pollution levels are raising because of massive use of cars, old heating plants and strong presence of industrialization next to city borders (European Commission, 2016; ARPAV, 2014). EU laws on urban air quality in the meantime are becoming stricter, and because of this, governments and municipalities are trying to find new ways to reduce air pollution. Most municipalities can only apply low budget and piece-meal-approach solutions like improvement of cycle paths, pedestrianizing of some streets, improvement of public transport systems, planting of more trees and creation of green areas. Other cities develop long term urban plans; those are large scale project and broad intervention that, even if they are brilliant ideas and good project, are expensive and difficult to realize and for this reason remain unrealized. The consequence is that both these strategies don't give appropriate answer and urban problems related to air quality increase. Beside these "governance" gaps there is another element, often not considered, that comes into play. It is the question of people perception about the problem and about the real condition of air pollution. It's quite common that even if there is a low amount of air pollution people might think the opposite and on the other hand it might happened to find people that think they are in an unpolluted area even if it's not so[2].
This is of course because of the characteristic of air of being non-visible - anyone can see or perceive the polluted water

01

of a river, or rubbish that contaminates the ground - but also because there are many factors that summed up together define the amount of pollution (such as wind, low or high pressure, no rain, noise, amount of green areas, building quality, etc.) or that influence the perception of the pollution (a space with trees and other green elements can be perceived as healthy even if the air is polluted).
Due to these distorted perceptions, contrast between citizens and public administration are growing and the different urban stakeholder come into conflict. In this context of distrust condition, it is obvious that the solutions to tackle urban problems proposed by the city administration - that already are, as explained before, often unprofitable solutions - are most of the time unwelcomed by the citizens.

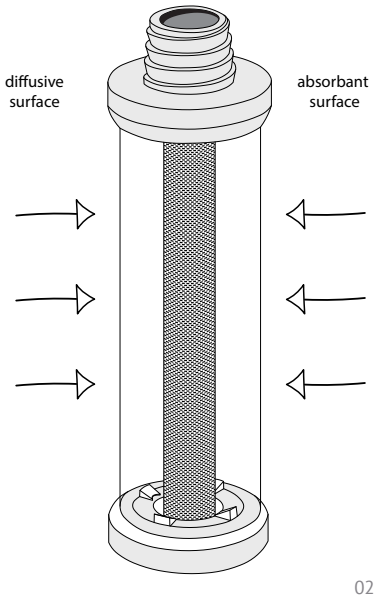
The LOOPER project

In these conditions of conflict, planning and implementation to improve public spaces and to mitigate air quality can be enhanced through citizen-administration co-creation processes not limited at isolated moment of the design procedure.
The aim of the LOOPER project[3] is to build a participatory co-creation methodology and platform to demonstrate "learning loops" inside Urban Living Labs, i.e. new ways of decision-making which bring together citizens, stakeholders and policy makers to iteratively learn how to address urban challenges. The "learning" that the LOOPER project brings inside the Urban Living Labs is based on the learning loop concept. In LOOPER a loop starts with collective debate on urban or neighborhood issues, then frames the problem and collects data to create a contest awareness. An interactive platform visualizes the data and enables the co-design and evaluation of solutions. The selected solutions - small scale interventions that can be realized in a short time - are then implemented in the city, and the results are monitored with a second loop that learns from the first one. The LOOPER methodology - which long-term purpose is to improve the transformation processes of the built environment - is going to be applied in three different European cities where Urban Living Labs, with different spatial, cultural and thematic contexts, will test and improve the methodology: traffic calming in Brussels; safety and security in Manchester; environmental (air and noise) pollution in Verona.

The case of South Verona

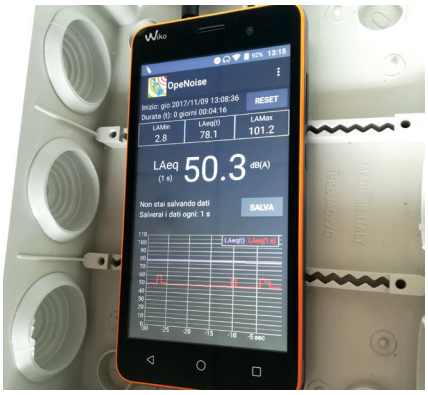
The case of Verona is applied at the neighborhoods of Borgo Roma and Golosine-Santa Lucia localized in the south part of the city, so called South Verona (img. 01).
In this part of the city was established and developed an Industrial Agricultural Zone. The consequence was the rapid growth of the two residential areas on the sides of the large agricultural industrial triangle. The neighborhood is clearly separated from the historic city by the railway infrastructures, while an important road axis that connect the highway, south, with the old town, north, divides the city into two residential parts without a real urban center and mutual relations.

> "air pollution is something non-tangible and because of this it can be misperceived by citizens"

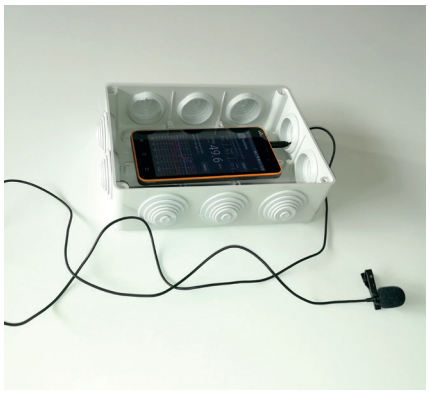


02

> low-cost sensors are a reality but they should be use as indicator of exposure and not to gain data on pollution



03


04

Finally, the absence of typical contents of a self-sufficient urban fabric (public buildings, specialized buildings for culture and entertainment, museums, parks, architectural quality buildings) makes it homologous to neighborhoods and dormitories of all suburbs (Masterplan Verona Sud, 2011). These morphological weaknesses worsen the problem of air and noise pollution, consequence of the high traffic level - the presence of commercial centers and other activities such as the fair increase even more the traffic in the area - and of reduction of green areas.

About air pollution exists a strong contrast between citizen's associations and the city administration, which is presumed guilty by citizens to hide the real situation of pollution of the area. This has created a situation of distrust between citizens and administration. The ambition of the LOOPER project is to overcome this situation of contrasts through the implementation of learning loop inside Urban Living Labs toward a process of co-creation of shared solutions. The concept that is at the base of the project is simple: if different stakeholders of the city are collaboratively involved, since the preliminary stages of problem analysis and learning of urban issues, and then work together in a cyclic process of defining, evaluating, and refining solutions - a learning loop cycle - city decision making is enhanced and contrast eliminated toward a more efficient and effective governance of the city.

The first step of the project is the analysis and measuring of environmental pollution through a collaborative and learning process that consider also direct participation of Urban Living Labs components (citizens) in the measuring activities.

Noise and air pollution monitoring is usually performed through professional instrumentation, which is the only one that can provide highly accurate data acquisition, but those are also characterized by high costs and size and therefore non-adapt at participatory monitoring. However, there are low-cost alternatives that still provide, even if approximate, acoustic and air quality information. Smartphones can be used for low-cost environmental noise monitoring as an alternative, or almost an integration, to professional monitoring systems. Obviously, the accuracy of the detected data is not comparable to the one obtained by means of class 1 sound level meter[4], but it still allows to collect data that qualitatively describe the characteristics of the acoustic environment.

For the acoustic monitoring in the LOOPER project, it was chosen to use the measurement set-up developed by Arpa Piemonte (Masera *et al.*, 2016). It is a very low-cost system[5] made out of an Android smartphone and an omnidirectional lavalier microphone in a waterproof plastic box (img. 03). The system has been calibrated by comparison with a professional Bruel Kjaer 2260 Class 1 sound level meter at the Environmental Physics Laboratory FisTec of the Universitàà Iuav di Venezia. The Openoise software allows the acquisition of the A-weighted sound pressure level by means of a data-logger that saves within a data file.

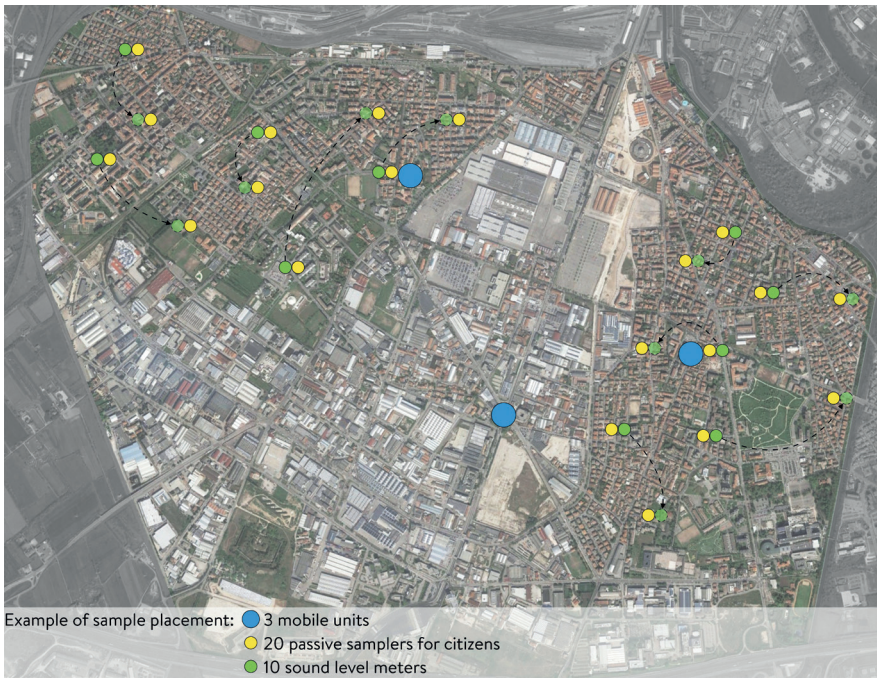
The low cost and its easy use allows the installation of more than one control unit in the area as well as the ability to directly involve the citizen who can visualize the environmental levels and identify the critical areas where to position them.

Along with noise measurements, air pollutants will be also surveyed with low cost instrumentation. We are talking about passive samplers (img. 02) which are cylindrical air samplers[6] with inside an adsorbent cartridge that is specific to each type of air pollutant like HF, NO_2, and SO_2.

During the campaign, these systems will be fixed to a polycarbonate support plate and sheltered within protective enclosures at a height of 1.5 to 4 meters above the ground level. At the end of the monitoring, the adsorbent cartridges are picked up and analyzed in specific laboratories. Not all air pollutants can be acquired with accuracy through low cost passive samplers. In the case of particulate matter (PM_{10}, $PM_{2.5}$), it will be necessary to use the measurement stations provided by Arpav and Legambiente. The station will also enable the acquisition of carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO), nitrogen oxides (NO_X), ozone (O_3) and other air pollutants. The measures of the Arpa mobile station will also be used to adjust measures of low-cost systems.

A relevant aspect to underline is that the location of all measurement systems - noise boxes, passive sensors and even the position of Arpav mobile station - will be identified by citizen trough discussions inside Urban Living Labs in cooperation with city administration.

This is a relevant innovation in citizen participation processes that consist in a direct involvement of citizens also in the investigation phase of problems inside a cooperation with city administration (img. 04).
Acquired data will be transformed in information about air pollution, noise pollution and exposure of inhabitants. Information will be visualized - using web-gis tools and 3D immersive technologies - though a dashboard inside the LOOPER platform. It will be the virtual working environment of the Urban Living Labs of citizens that starting from the understanding of urban issues are asked to work on possible solutions to improve the environment of their neighborhood.
The LOOPER kick-off was at the beginning of September 2017 and we are now in the inception phase of all the activities on the territory. As expressed during the kick-off, the ambition of the research team is to bring inside city "knowledge", "innovation" and "changes" improving the transformation processes of the built environment toward more livable urban spaces.
In the next three years two learning loops will be completed within the Urban Living Lab, in this way stakeholders will have the chance to see what change will be produced by the application of their ideas and they'll also be able to improve those ideas within the second Loop.
The LOOPER website will soon be online and anyone will be able to see the progresses of the project.▲



05

NOTE
1 - The term "soundscape" has been first used by Michael Southworth in 1969.
2 - Gidlof-Gunnarsson e Ohrstrom, 2007; King et al., 2016; Carducci et al., 2017.
3 - LOOPER, Learning Loops in the Public Realm, is an European Research Project funded under the JPI Urban Euope Joint Programming, an instrument which was launched by the European Commission in 2008. Main European project partners are: Vrije Universiteit Brussel MOBI Mobility, Logistics and Automotive Technology Research Centre; University of Manchester, Centre for Urban Resilience and Energy. In Italy, the Università Iuav di Venezia coordinates the other Italian partners: Legambiente and City of Verona.
4 - The class of a sound meter level describes its level of precision. In the standard IEC 61672 "Electroacoustics - Sound level meters", are defined four levels of accuracy from more to less accurate: 0,1,2 and 3. Class 1 is used for precision measurements in the field.
5 - The cost of each station is about 100,00€.
6 - Radiello.com. (s.d.). From: www.radiello.com

BIBLIOGRAFIA
- ARPAV, "Relazione sulla qualità dell'aria anno 2014, Provincia di Verona", 2014.
- European Commission, "In-depth report 13. Links between noise and air pollution and socioeconomic status", in "Science for Environmental Policy", 2016.
- Carducci A., et al., "Air pollution: a study of citizen's attitudes and behaviours using different information sources", in "Epidemiology Biostatistics and Public Health", 2017, vol. 14, n. 2.
- Gidlof-Gunnarsson A., Ohrstrom E., "Noise and well-being in urban residential environments: The potential role of perceived availability to nearby green areas", in "Landscape and Urban Planning", 2007, vol. 83, issues 2-3, pp. 115-126.
- King E.A., Bourdeau E.P., Zheng X.Y.K., Pilla F., "A combined assessment of air and noise pollution on the High Line, New York City", in "Transportation Research Part D: Transport and Environment", 2016, vol. 42, pp. 91-103.
- Masera S., Fogola J., Malnati G., Lotito A., Gallo E., "Realizzazione di un sistema di monitoraggio del rumore a basso costo attraverso la nuova app android "openoise", in "Rivista Italiana di Acustica", 2016, vol. 40(1-2), pp. 45-58. On www.acustica-aia.it
- Paas B., Stienen J., Vorländer M., & Schneider C., "Modelling of Urban Near-Road Atmospheric PM Concentrations Using an Artificial Neural Network Approach with Acoustic Data Input", in "Environments", 2017, vol. 2(4), pag. 26.
- Ravetz J., "Urban Synergy-Foresight", in "Urban Governance in the EU Current Challenges and Future Prospects", 2011, pp. 31-44.
- Scholl C., Kemp R., De Kraker J., "City labs instruments to shape common ground in urban sustainability", in "JPI Urban Europe Transition Pathways Symposium", 2016.
- Southworth M.F., "The Sonic Environment of Cities," in "Environment and Behavior", 1969.
- Grison M., Boninsegna P., FOA Federico Oliva Associati, "Masterplan Verona Sud", in "Piano degli Interventi Verona", 2012.
- Voytenko Y., et al., "Urban living labs for sustainability and low carbon cities in Europe: towards a research agenda", in "Journal of Cleaner Production", 2015, vol. 123, pp. 45-54.