BEYOND THE NOISE: OPEN SOURCE SOUNDSCAPES
A NOVEL MIXED METHODOLOGY TO IDENTIFY, EVALUATE AND PLAN QUIET AREAS IN CITIES

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BEYOND THE VISUAL PARADIGM: THE SOUNDSCAPE APPROACH TO CITY SENSE AND CITY DESIGN

2016
Soundscapes and Lighscapes of the night. Berlin/Florence

2015
Toscana Sound Map

2012, Book
“On the Sonic Image of the City. Soundscape Mapping and Design in the contemporary city”

2010, Ph.D.

2009-on
Firenze Sound Map

2007
MIT Digital City Design Workshop: “Soundscapes Oltrarno”
By 2030, the no. of vehicles will increase from 287 to 298 millions.
Data source: ICCT Global Transportation Roadmap Model

By 2030, the world is projected to have 41 mega-cities with more than 10 million inhabitants
Data Source: 2014 UN World Urbanization Prospects

Today, 123 million Europeans are affected by noise pollution from traffic.
Data Source: European Environment Agency 2014
• Acoustical criteria, such as “noise indicators” set up by EU Member States (END 49/2002)
• Distance-based criteria
• Mixed criteria: e.g. size, land use, noise indicators, accessibility, visual quality, SLOPE, TRAPT/TR, QUAs etc.

(European Environment Agency, 2014)

“there is still the need for in-depth research in the field”, by experimenting with mixed methodologies”

(European Environment Agency, 2014)
SOUNDSCAPE THEORY
The soundscape is rather a “resource” (Schulte-Fortkamp 2013)

THEORY ON THE COMMONS
Commons are “cultural and natural resources accessible to all members of a society which should be “co-governed by its user community“ (Bauwens et al. 2017)

CITY PLANNING THEORY
Human scale concept & “sensuous criteria” (Lynch 1971)
“The Practice of Everyday Life” (De Certeau 1980, 1984)

HYPOTHESES

1) QUIETNESS AS A COMMONS as “a natural and cultural resource, accessible to all members of society and co-governed by its user community”

2) criteria:
- people’s preferences
- accessibility
- small size < 1ha
- neighborhood scale <30 ha (Berlin)
- walking distance grid

3) “everyday quiet area”
SOUNDSCAPE THEORY
The soundscape paradigm has become an important tool in facilitating people’s involvement in soundscape evaluations and decision processes (Brooks and Schulte-Fortkamp 2016)

CITIZEN SCIENCE PRACTICE
There is a trend in citizen science towards the use of GPS-equipped smartphones as sensors in data collection in the field of environmental noise (Theunis et al. 2017)

CITY PLANNING THEORY
Urban acupuncture (Bohigas 1992)
“Performance dimensions”, especially “the sense” (Lynch 1984)

ANALYSES
1. open interviews
3. group soundwalks
5. the Hush City mobile app

PLANNING
1. “sonic acupuncture”
2. Open source digital multi-layers map
1 PILOT STUDY & 4 PHASES

WORK PLAN

OUTPUTS

IMPACT

THE HUSH CITY APP, SURVEYS, SOUNDWALKS

THE EVERYDAY QUIET AREAS MAP

THE EVERYDAY QUIET AREAS MASTER PLAN

PEOPLE

ANALYZE

MAP

ASSESS

PLAN

IMPACT

POLICIES AND PARTICIPATORY PROCESSES

Radicchi_2017_BTN:OSS (C)
IN BERLIN APPROXIMATELY 200,000 INHABITANTS ARE AFFECTED BY NOISE POLLUTION FROM ROAD TRAFFIC
CONTINUOUS OPEN AREAS
"forest, green spaces, parks, fields, farmland and meadows", bigger than 100 hectares and with noise levels below 55 dB(A)

RECREATIONAL AREAS
"green areas and recreation areas near residential areas within walking distance", bigger than 30 hectares and characterized by a relative limit noise level value of 6dB(A).
Walking grid to access to destinations (WRI 2015)
1 Km
Walking grid to access to destinations (WRI 2015)

BERLIN
- The S-Bahn Ring
- Existing Quiet Areas
- Future Quiet Areas

Radicchi_2017_BTN::OSS (C)
The Reuterkiez AKA Kreuzkölln

Let's move to Kreuzkölln, Berlin

It's the epicentre of cool

Heading source: The Guardian, March 19 2011
TOURISTIFICATION IN PROGRESS

THE TURKISH COMMUNITY & THE BERLINERS

YOUNGSTERS & HIPSTER GROUPS
KNOWLEDGE PRODUCTION?

LIMITS OF THE REUTERKIEZ ON THE TOP OF THE BERLIN NOISE MAP

FLYER POINTING OUT NOISE ISSUES IN THE REUTERKIEZ
PUBLIC PARTICIPATION

RECRUITMENT CRITERIA
1. people living in the neighborhood
2. people working in the neighborhood
3. visitors
w/ StadtteilBüro Reuterkiez

IN THE ANALYSES PHASE:
1. INFORMAL INTERVIEWS (10/30)
2. GROUP SOUNDWALKS (2/3)
3. SURVEYS BY USING HUSH CITY APP
MOBILE APPS FOR CROWDSOURCED NOISE- & SOUND MAPS
MAP & EVALUATE

People can map and evaluate “everyday quiet areas” by collecting mixed data:
- audio recordings
- sound pressure levels
- pictures
- date & time
- address
- user feedback.

FIND QUIET AREAS

People can use the app also to identify “everyday quiet spots” nearby mapped by other members of the community.

HUSH CITY APP

TECHNOLOGY
- both iOS and Android operating systems
- Code languages: Swift 3, Java and Android SDK
- Framework: a Titanium platform
- Repository: LAMP stack
- Audio data: sampled at 44.100Hz, with a resolution of 16bit
- Sound pressure levels: calculated as numeric scale values and A-weighted (see Noise Tube libraries)
- Pictures are collected at a maximum resolution of 6MP and 24bit color

CREDITS
- Inventor: Dr. Arch. Antonella Radicchi
- Software Development: QUERTEX GmbH (GER) with EdgeWorks Software, Ltd.
1/ MAP THE QUIETNESS AROUND YOU!

- RECORD THE SOUND
- ANALYZE THE SOUND
- DISPLAY SOUND PRESSURE
- TAKE A PICTURE
- TAKE IT AGAIN or GO ON

REPLY TO THE QUESTIONNAIRE: SECTION 1, 2, 3 AND 4

Submit Successfully
Thank you, you will be redirected to our next survey.
SUBMIT YOUR SURVEY!
2/ EXPLORE QUIET SPOTS NEARBY!

MAP VIEW MODE

CLICK ON THE MARKER

EXPLORE THE QUIET SPOT

READ THE USER FEEDBACK

LIST VIEW MODE
HUSH CITY APP

< screenshot of 45 datasets collected by people in the Reuterkiez (as of June 20 2017)

45 DATASETS IN REUTERKIEZ

LEGEND:
The colour scale reference is taken from the strategic Noise Map of Florence

The number on the markers indicates the number of surveys made on the spot
Each dataset is composed of:

+ 1 audio recording
+ 1 sound pressure levels
+ 1 picture
+ date & time
+ address
+ user feedback

The questionnaire is composed of 24 questions, articulated in 3 parts:

1) Soundscape issues
2) Behavioral issues
3) General issues

Replies can be given by means of: multiple choice, linear scale and free text rating methods.
(Lavandier 2016, QUADMAP Guidelines 2016)
SOUNDSCAPE QUESTIONS

1. What prompted you to record this sound?
   - □ Pleasure
   - □ Comfort
   - □ Irritation
   - □ Distraction
   - □ Happiness
   - □ Sadness
   - □ Calm
   - □ Anger
   - □ Nostalgia
   - □ Anxiety
   - □ Surprise
   - □ Shame
   - □ Fun
   - □ Disgust
   - □ Boredom
   - □ Interest
   - □ Other

2. In which category would you place this sound?
   - □ Human Voices
   - □ Human movement
   - □ Natural elements
   - □ Animals
   - □ Vegetation
   - □ Construction
   - □ Ventilation
   - □ Motorized Transport
   - □ Non-motorized transport
   - □ Social/Signals
   - □ Music
   - □ Other

3. Using the words given below, please describe the sound you recorded. Select all that apply!
   - □ Lively
   - □ Meaningless
   - □ Natural
   - □ Boring
   - □ Pleasant
   - □ Artificial
   - □ Familiar
   - □ Unpleasant
   - □ Friendly
   - □ Unfamiliar
   - □ Informative
   - □ Unfriendly
   - □ Stressing
   - □ Uninformative
   - □ Beautiful
   - □ Relaxing
   - □ Preferred
   - □ Ugly
   - □ Meaningful
   - □ Unpreferred
   - □ Other

4. Rate how quiet the soundscape is in this location
   - Very Noisy
   - Very Quiet

5. Enter one of the sounds that contributes in a positive way to your sense of quietness in this location:

6. Enter one of the sounds that disturbs your sense of quietness in this location:

7. To what extent do the sounds in this location promote social interaction?
   - Very Low
   - Very High

8. To what extent do the sounds in this location encourage you to have conversations here?
   - Very Low
   - Very High

9. Can you hear other people's conversations around you?
   - Yes / No

10. Enter one of the sounds that contributes to the identity of this place:
BEHAVIOURAL QUESTIONS

11. Are there people around
   □ No one  □ Many
   □ A few   □ Other _________________________

12. What are people doing here?
   □ Passing through  □ Reading
   □ Working         □ Talking
   □ Relaxing        □ Playing
   □ Recreation     □ Playing
   □ Waiting         □ Other _________________________

GENERAL QUESTIONS

13. Please select one of the options below
   □ I live here      □ I am a visitor
   □ I work here     □ Other _________________________

14. How is the weather?
   □ Windy          □ Sunny          □ Cold
   □ Snow           □ Cloudy         □ Clear
   □ Rainy          □ Stormy         □ Hot
   □ Humid          □ Dry            □ Harsh
   □ Foggy          □ Icy            □ Other _________________________
   □ Calm           □ Warm

15. Rate the overall quality of this location
   Very Bad o o o o o Very Good

16. Rate the overall cleanliness of this location
   Very Bad o o o o o Very Good

17. Rate the overall maintenance of this location
   Very Bad o o o o o Very Good

18. Rate the feeling of security in this location
   Very Bad o o o o o Very Good

19. Rate the overall accessibility to this location
   Very Bad o o o o o Very Good

20. Please add your additional comments and thoughts in the blank space below.
## HUSH CITY APP | INTERMEDIATE DATA EVALUATION (I)

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| Total                     | 43     | 36       | 12       | 26       | 1         | 23        | 4       | 2            | 4          | 6       | 2          | 1           | 1         | 1         | 1         | 166   |

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Area 155 is lively 42.0 dB(A)

Area 156 is lively 53.6 dB(A)

Area 158 is familiar 53.5 dB(A)
#1 THE “COMMUNITY EXPERT ON SOUNDSCAPE"
One-day long workshop to traine committed citizens in order to transfer to them the knowledge necessary to keep on the project after its end and to actively contribute in the participatory planning processes.

#2 THE “SOUNDWALKING IN THE KIEZ” PROGRAM
A soundwalk program which was launched in the frame of the 2017 International Noise Awareness Day. In the next years, on INADs, the soundwalk will be guided by the “community experts on soundscape”.

DISCUSSION

• Data quality (Murphy and King 2016)
• Knowledge production processes (Theunis et al. 2017)
• Civic awareness and bottom up participatory processes (Haklay 2017)

FUTURE WORK

• Implementation of new features: e.g. diverse languages; automatic calibration processes
• Psychoacoustic analyses: to further investigate quiet spots identified by the participants
• Comparative studies: e.g. with USA cities, such as Cambridge

From an urban planning perspective, the paradigm of “quietness as a commons” has the potential to achieve integrated urban planning processes for the environmental just and human scale city.
“To my mind, sound[scape] study succeeds when it contextualizes aural experience in the rest of life”
(K. Norman 2013)

THANK YOU FOR LISTENING

STAY IN TOUCH!
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www.antonellaradicchi.it
@HUSHCITYapp