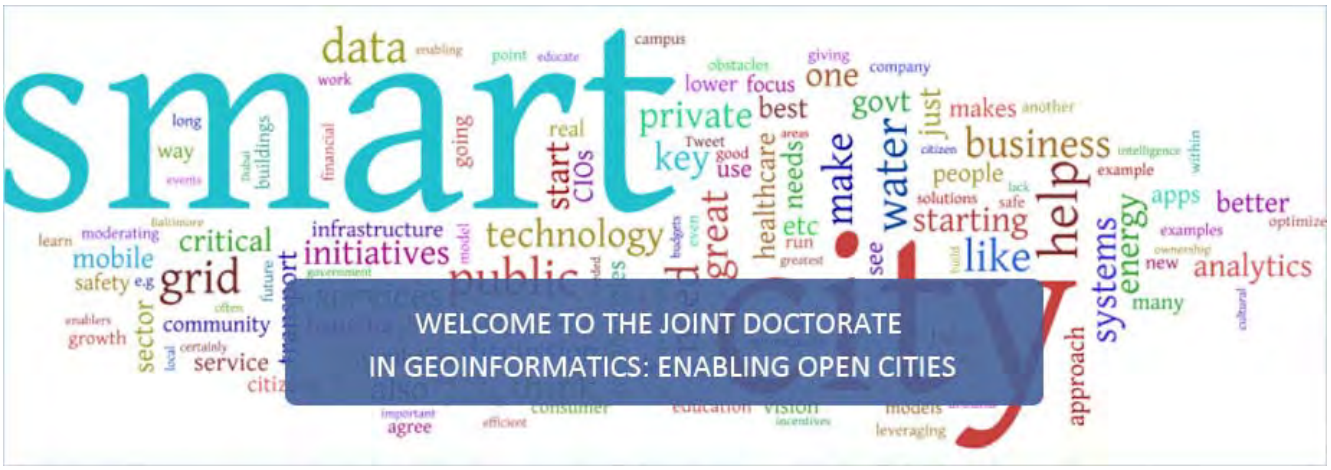


D.6 INTERNATIONAL SCIENTIFIC EVENTS

JOINT DOCTORATE IN GEOINFORMATICS: ENABLING OPEN CITIES

GRANT AGREEMENT NUMBER 642332 — GEO-C — H2020-MSCA-ITN-2014.

SEPTEMBER 18TH, 2017

AUTHORS: CHRISTOPH BROX

Within the dissertation projects, each ESR was supposed to be involved in the organization of an international scientific event. The goal were

- To expose ESRs to an high-level international academic environment;
- To get feedback in terms of content from senior scientists;
- To acquire soft skills in organizing such an event;
- To strengthen their professional networks;
- To disseminate the GEO-C results.

The ESRs organized the following workshops at international scientific conferences:

1. Fernando Benitez, Mohammad Mehdi Moradi: Open Data for Cities; Pre-conference workshop at AGILE conference 2017, Wageningen, NL, May 9, 2017; http://opendata4opencities.uji.es
2. Albert Acedo Sánchez, Mijail Naranjo, Mehrnaz Ataei, Ana Bustamante, Guiying Du, Manuel Portela, Khoi Manh Ngo: Opening Smart Cities: Challenges to engage citizens through information systems"; Pre-conference workshop at 25th European Conference on Information Systems (ECIS), Guimarães, Portugal; June 6, 2017; http://geo-c.uji.es/blog/2017/03/07/cfp-workshop-ecis2017-openin g-smart-cities-challenges-to-engage-citizens-through-informatio n-systems/
3. Diego Pajarito: Geogames and Geoplay; Pre-conference workshop at AGILE conference 2017, Wageningen, NL, May 9, 2017; http://www.geogames-team.org/agile2017/
4. Shivam Gupta, Rustam Kamberov, Fernando Santa, Marek Šmíd: Spatial–Temporal Predictive Modeling with Open Source and Open Data for Urban Areas Kick – off Workshop at The Association of American Geographers Annual Meeting in Boston, April 5–14, 2017, http://www.aag.org/cs/annualmeeting/schedule_and_program/field_trips_workshops/workshops
5. Mijail Naranjo, Guiying Du, Khoi Manh Ngo: E-participation in the urban planning process: challenges to be addressed by Information and Communication Technologies; Pre-conference workshop at International Conference for E-Democracy and Open Government 2017 - CEDEM 2017. Krems an der Donau – Austria / 17-18-19 of MAY-2017 (Workshop day: 18-May-2017), http://geo-c.uji.es/blog/2017/05/25/geo-c-cedem2017-e-participation-in-the-urban-planning-process-challenges-to-be-addressed-by-ict/

Please find the workshop reports in the annex.

OPEN DATA FOR CITIES

Reuse and Discovery level applied to spatial point process on linear network

Workshop report

AGILE conference 2017
Wageningen University
The Netherlands
9 May 2017

opendata4opencities.uji.es

Fernando Benitez
Mohammad Mehdi Moradi
GeoC: Enabling Open Cities
Universitat Jaume I
Spain

22 May, 2017

Content

1. Introduction

Open Data for Open Cities: Re-use and discovery level, applied to the spatial point analysis process on linear networks was a full day pre-conference workshop at the last conference of the Association of Geographic Information Laboratories in Europe (AGILE). This workshop is part of Geo-C: Enabling open cites a European project joint with three universities, Universitat Jaume I in Spain, Nova IMS in Portugal and Munster University in Germany. GEO-C aims to contribute methods and tools to realize smart and open cities, in which all groups of society can participate on all levels and benefit in many ways.

This workshop joint two relevant research topics, first one the problem of having several data sources and open data in cities but without reuse or impact indicators to get a better understanding of how to improve and make the available data usable. The second one was spatial point process in which it aims to find new methods to analyze the open data available in city's streets to a better understanding of cities patterns.

In order to enrich the discussion about those research topics and present the preliminary results, with the collaboration of AGILE 2017 committee the authors of this report present an extensible agenda that has included keynote talk, four selected papers, and two interactive sessions about open data reuse and spatial point process.

The initial interactive session related to city open data system was a group activity to get feedback on concepts as reusability of open data. Last session using spatial point process, we here consider a set of open data of traffic accident from Medellin, Colombia and using kernel smoothing on networks [3] we estimate the intensity to find the high/low-intensity streets in terms of the traffic accident.

This report showed the detailed agenda, selected papers and their abstract, workshop's resources, a summary of the interactive sessions, some future results and the most important discussions about the topics presented for over 13 attendants.

This participatory workshop focus on an academic audience and open data expert to get new insights, feedback, and collaboration for the authors' research. This one was the fifth version, the latest editions were created to engage open data users, and authorities in several cities in Colombia and Spain. Now with a set of selected papers, professors, European data portal consultant and Ph.D. student this workshop was an open space to discuss open data and spatial point process as a use case.

2. AGILE Conference

The Association of Geographic Information Laboratories in Europe (AGILE) was established in 1998 to promote academic teaching and research on GIS at the European level and to ensure the continuation of the networking activities that have emerged as a result of the EGIS Conferences and the European Science Foundation GISDATA Scientific Programmes.

AGILE seeks to ensure that the views of the geographic information teaching and research community are fully represented in the discussions that take place on future European research agendas. AGILE also provides a permanent scientific forum where geographic information researchers can meet and exchange ideas and experiences at the European level[1].

This association has every year the annual international conference on Geographic Information Science. Topics cover Big Spatial Data: Analysis and Visualization, Volunteered Geographic Information and Community Observatories, Socio-Economic Impact Assessment of GI and GIScience and Technology Education and Training to name just a view.

The 2017 conference theme is 'Societal Geo-Innovation'. Because of the Societal Geo-Innovation conference theme sessions will be organized to pay special attention to developments and applications that contribute to the first five goals of the 17 sustainable development goals of the United Nations.

During 2017 AGILE reach twenty years. The conference was a great event to discuss the embedding of geo-information in society: What has been the societal impact of geo-innovations over the past 20 years? What will state-of-the-art geo-information science topics boost societal changes within the nearest future?[2]

From 9 May until 12 May, AGILE 2017 took place in Wageningen University, The Netherlands, with a remarkable local committee, GIS & remote sensing (WUG-GRS), Wageningen Environmental Research (Alterra) and The Graduate School for Production Ecology & Resource Conservation (WUR-PE&RC). During one week, the conference presented pre-conference workshops, Keynotes and parallel sessions, business partners showcase and an interesting poster session.

Along this week, the most significance GIScience topics such as VIG, Data Quality, Spatial analysis, Open Data, GeoGames, smart cities and others were discussed for Ph.D. and master students, professors from several countries, remarkable researchers in differents field, industry and local administrations.

[1] https://agile-online.org/index.php/about-agile
[2] https://agile-online.org/index.php/invitation

3. Workshop Agenda

The pre-conference AGILE 2017 Workshop Open Data for Open Cities was the 5th version of this workshop. During this session, the workshop's aim was to include the academic perspective and enriching the discussion around reuse and discoverability level with open data experts. Having an extensive agenda with several topics and a keynote presentation the session of this workshop were following.

Time	**Session**	**Lead by**
9:00 – 9:30	Opening and Introduction to the workshop.	Joaquin Huerta, Fernando Benítez, Mehdi Moradi
9:30 – 10:00	Keynote Talk: Barriers and benefits in working with Open Data.	Heleen Vollers, European Data Portal.
10:00 – 10:30	Open data portals as part of the open data ecosystem? Lessons learned from geoportal research.	Bastiaan van Loenen, Knowledge Centre Open Data - Joep Crompvoets, Instituut voor de Overheid
11:00 – 11:20	Integrating geological and seismological data in point process models for seismic analysis.	Marianna Siino, Dipartimento di Scienze Economiche, Palermo, Italy
11:30 – 11:50	Crime and Open Data, Use case Spain.	Raquel Martin-Pozuelo Ojalbo, Master GeoTec, Spain
12:00 – 12: 20	Open data and disaster management.	Ditsuhi Iskandaryan, Master GeoTec, Spain
13:40 – 14:30	Group Activity: Hands-on Activity, Open Data and its impact	Fernando Benitez, Medhi Moradi
14:30 – 15:30	Interactive session, Part I with point process analysis: Learn how to find the hotspots in cities' street network. Theory part	Mohammad Mehdi Moradi
16:00 – 16:30	Interactive session with point process analysis Part II: Learn how to find hotspots in cities' street network.	Fernando Benitez, Mohammad Mehdi Moradi
16:30 – 17:00	Open Discussion and Conclusions outline for a research report and future outcomes.	Joaquin Huerta, Fernando Benítez, Mohammad Mehdi Moradi

4. Workshop resources and General Stats

Open Data for Open Cities: Re-use and discovery level, applied to the spatial point analysis process on linear networks workshop has two main resources to allow participants and anyone interested in those topics can follow the activities that took place in the last AGILE.

Resources

1. **Workshop's website:** Find here all the details of the workshops, slides of presentations, presenters, topics, our keynote presentation, committees for sutre contact. http://opendata4opencities.uji.es/
2. **GitHub Repository:** This repository is a open tutorial that anyone can fork to do the activities presented in the workshop. https://github.com/GeoTecINIT/OpenData4OpenCities

General Stats of the Workshop

- Number of participants: 13 participants.
- Roles of participants:
    a. Associate professors.
    b. Ph.D. students.
    c. Master Students
    d. Senior Consultant
- Topics discussed
    a. Reuse and discoverability of open data.
    b. Current and future city open data system.
    c. Crime and Open Data.
    d. Disaster management and open data.
    e. Spatial point process and open data.
    f. Assessments of Open data portals
    g. Barriers and benefits of working with open data.
- Number of presentations:
    a. Four presentations of selected papers. All slides of those presentations are available in Workshop's GitHub repo
    b. One Keynote presentation led by a senior consultant for European Data portal.
    c. Two presentations related to current open data barriers of developers and analysts in cities, an open data system to improve the reuse and discoverability level, and new methodology to analyze a set of points event to create an intensity network along the street network in cities.
- Costs
  Regarding to associated cost per organize
    1. Registration for entire AGILE conference and Workshop: 260 euros.
    2. Travel (Flight+Hotel) whole conference: 525 euros

  Regarding to associated costs per participants.
    1. Registration only workshop: 60 euros.
    2. Travel (Hotel+train): 136 euros.

5. Participants

This workshop was attended by participants from different academic sectors, associate professors, master and Ph.D. students until a senior consultant were part of the discussion. Would like to read and explore the selected papers and presentations, click here.

Keynote talk

To enrich the discussion related to barriers form data consumers and data producer perspective as well as the benefits in working with open data. Heleen Vollers Senior Consultant of Capgemini Consulting and who collaborated in the last analytic report of European Data portal. Her talk about Barriers and benefits in working with Open Data showed to participants how some cities in Europe are dealing with data user and data producer barriers, besides what are the advantages to putting more effort around the open data initiatives in cities.

Heleen is actively involved in the development of the European Data Portal and associated services, on behalf of the European Commission – DG CONNECT. She is the stream lead on support services to countries as they mature on their Open Data journey and is in charge of stakeholder management. In addition, she leads the research work on measuring the level of Open Data maturity across Europe.

Before joining Capgemini Consulting, she worked as Director EU Affairs in Brussels representing the critical raw materials industry. Would like to read the European Data portal blob about the lessons learned in this workshop click here:

Selected paper presentations

During this workshop and in the morning session the workshop had four selected presentation as following

1. **Associate Professor, Dr Bastian van Loenen from Delft University of Technology - Knowledge center geoinformation and governance, with Open data portals as part of the open data ecosystem? Lessons learned from geoportal research.**

   Abstract: Many countries and also cities have their own open data portal which provide geographic data that can be used even by citizens. One of the current challenges is to satisfy user needs to ensure that the data that is provided through the portal is actually used. This paper provides insights in the findability of datasets through of a special kind of portal: the geoportal. It presents the main findings of research accomplished on the findability, attainability and usability of geoportals through an assessment of the transaction costs involved.

2. **Phd Student, Marianna Siino from Dipartimento di Scienze Economiche, Palermo-Italy with Integrating geological and seismological data in point process models for seismical analysis.**

   Abstract: Nowadays in the seismic and geological fields, large and complex data sets are available. This information is a valuable source that can be used for improving the seismic hazard assessment of a given region. In particular, the integration of geologic variables into point process models to study seismic pattern is an open research field that has not been fully explored. In this work, we present several open-access datasets (the catalog of the earthquakes, geological information such as faults, plate boundary and the presence of volcanoes) that are properly treated to describe the seismicity of events occurred in Greece between 2005 and 2014. We use these datasets to fit an advanced spatial point process model for the description of interaction among the points in the presence of larger-scale inhomogeneity.

3. **Master student, Raquel Martin-Pozuelo Ojalbo from Master GeoTec, Spain with Open Data Of Crime: A Review of Spanish Open Data Portals.**

   Abstract: Everybody has access to open data about crime in Spain, but we can find different problems depending on the kind of user that is going to use the data. In one hand, for citizens could be difficult because sometimes they do not know that this data is available, they do not have the local knowledge to use it or because they do not know the context of this data and they cannot interpret it. On the other hand, for professionals, this kind of data would be more useful if they could have access to more detailed data instead of having the same data as a citizen could have.
   The figure of criminologist or crime analyst is still not existing in Spain and creating them and give them a special access to police data, taking into account the data protection law, could do possible creating a new sector, being assessors on police offices or government in order to help to understand better the crime in a city or in a country or to create new strategies for crime prevention.

4. **Master student, Ditsuhi Iskandaryan, Master GeoTec, Spain with Open data and disaster management.**

   Abstract: Disasters, such as earthquake, flood, hurricane and so on, are events which occurred suddenly and cause human, economic and environmental damage. Population growth, spread of disease, climate change affect on frequency and intensity of disaster occurrence. During Haiti earthquake disaster took 220,000-336,000 lives, during Hurricane Katrina it took 1245-1836 lives. For decreasing these numbers, for sustainable development it is important to concentrate on disaster management. Organizations and agencies working on disaster management need to collaborate with partners, find more data, find a way for mitigating losses and risk. Open data is one of the valuable sources, which plays crucial role in disaster management.

6. Data used

In the interactive sessions and collaboration with Alcaldia de Medellin (Local Authority) and Grupo de Datos abierto de la ciudad de Medellin (Data consumers group), the workshop has used open data from Medellin Open Data portals, so that street network from the urban area and car accidents dataset were gathered. The traffic accident dataset use has then been used in the spatial point process activity to draw the corresponding intensity function on street network of Medellin so that high/low-intensity streets in terms of the accident has been disclosed.

The main portal of Medellin city allows anyone to get access to several datasets related to many categories and some use cases or applications. It is a great portal with a lot of functionalities related to citizen services, powerfull geo-viewer, open data portals (Medellin city is in the middle of its Open Data Initiative, and it currently has counted with several portals), indicators, and applications. Many of those applications are developed for authorities.

The current challenge of Medellin city-hall is to improve the reuse and accessibility of their Open Data initiative, focusing on data consumers requirements. Therefore, they aimed to support this workshop to realize how to offer better open data services.

To test and use the new method to create the intensity network along the street network is a need to kind of datasets. Point events that could be accidents, reports, or any events, the important fact here is, the geometry of those events it must be a point. The second datasets needed is the street network with geometry required is line or polylines.

Medellin portals used

The datasets required were obtained in raw format in following portals of Medellin

- Map Catalog Open Data: The Geonetwork portal that includes several datasets, maps, and detailed metadata catalog. This portal includes maps, vectorial data, and graphics. However, the usability of the portal has several issues. The categories do not follow the common criteria of open data categories. It is a valuable resource with an interesting, useful data catalog but needs some improvements to help data user to find data required. Most of the useful dataset are in a downloadable format which is also good but makes difficult for developers connect their applications, reducing the reuse capacity.
- Open Geo Data Portal: ArcGIS Open Data portal with several datasets, defined by the most common categories. Datasets available can connect through API resource or downloadable format as KML, Shapefile or CSV. Improving The way to reuse those datasets in application out-of-the-box or local analysis. However the number of datasets is small, and there are some categories without any data, that can fall in a loss of confidence by the data user side.

Dataset used

The dataset used in this workshop were gathered in shapefile format. Car accidents for 2016 and Urban area street network in 2014. Both datasets required of some improvements to being used in the analysis stage, the issues founded are described in next section. To access and download the dataset used, click on the following links.

- Car accidents in Medellin City year 2016
- Street Network in Medellin City Year 2014

Initial issues

A common problem when an analyst needs to use the available data in open data portals is to determine the quality grade and usefulness of downloadable data. Most of the data portals do not include the possible data issues. Thus analyst must make sure that data is ready to be analyzed.

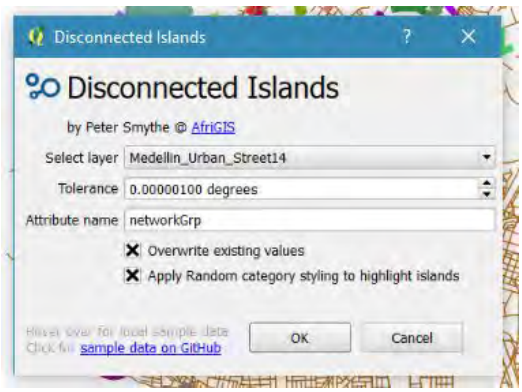
This was also the case for Medellin data with the two available aforementioned datasets. The method used here require two important data feature. First, as the kernel-smoothing is based on the distance between the events, it requires having a network fully connected otherwise we can not measure the distance within any part of the network, i.e. network must not have isolated lines or islands. Second, the reference system of both events locations and the street network needs to be the same.

Connectivity

In the case of the street network, more than 400 islands of lines or isolate lines had been found so that they were tiny streets (or parts of streets) and they even did not contain any event's location. Following shows how to deal with disconnectivity problem using GIS Plugin.

1. Make sure to have installed QGIS.

2. Install Disconnect Islands plugin: This is a useful and easy-to-use plugin that allows finding disconnected “islands” in a transport network. Just go to Plugins > Type Disconnected > Find Disconnected Island > Install.



3. To use this tool just load the shapefile in a new project in QGIS, then active the button for the new plugin. Then keep the same tolerance. The QGIS will create a new categorical classification using every “island” as a class.

4. Then using an attribute selection, you can filter only the connected lines and remove the “islands” or repaid using the edition session.

5. For this workshop was validated the “islands” using an Imagery OpenStreetMap, and only the relevant network was connected. Rest were deleted..

Medellin street network with “Islands” not connected

Fixed and shared Medellin street network

We here note that, the connectivity of the network can also be checked using R package “spatstat” with connected.linnet command. For more information click here .

Reference system

In order to be able to reconstruct the network data through R language, both event’s locations and network must be released with the same reference system. As available open data in Medellin has from different departments and sources, we found the event’s locations and network in different reference systems, both were projected, but they had a different datum. That’s why we needed to convert their reference systems to have both in the same reference system.

Current coordinate system:

```
GCS_WGS_1984
WKID: 4326 Authority: EPSG

Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_WGS_1984
  Spheroid: WGS_1984
    Semimajor Axis: 6378137.0
    Semiminor Axis: 6356752.314245179
    Inverse Flattening: 298.257223563
```

Car accident points, reference system: Geographic coordinate system, Datum D_WGS_84,

Current coordinate system:

```
PCS_MAG_Ant_Medellin
Authority: Custom

Projection: Transverse_Mercator
False_Easting: 835378.647
False_Northing: 1180816.875
Central_Meridian: -75.56488694
Scale_Factor: 1.0
Latitude_Of_Origin: 6.229208889
Linear Unit: Meter (1.0)

Geographic Coordinate System: GCS_MAG_Ant_Medellin
Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_DAT_MAG_Ant_Medellin
  Spheroid: GRS1980_MAG_Ant_Medellin
    Semimajor Axis: 6379647.0
    Semiminor Axis: 6358257.251396228
    Inverse Flattening: 298.257222101
```

Street network, projected coordinate system, PCS_MAG_Ant_Medellin, Datum D_DAT_MAG_Ant_Medellin

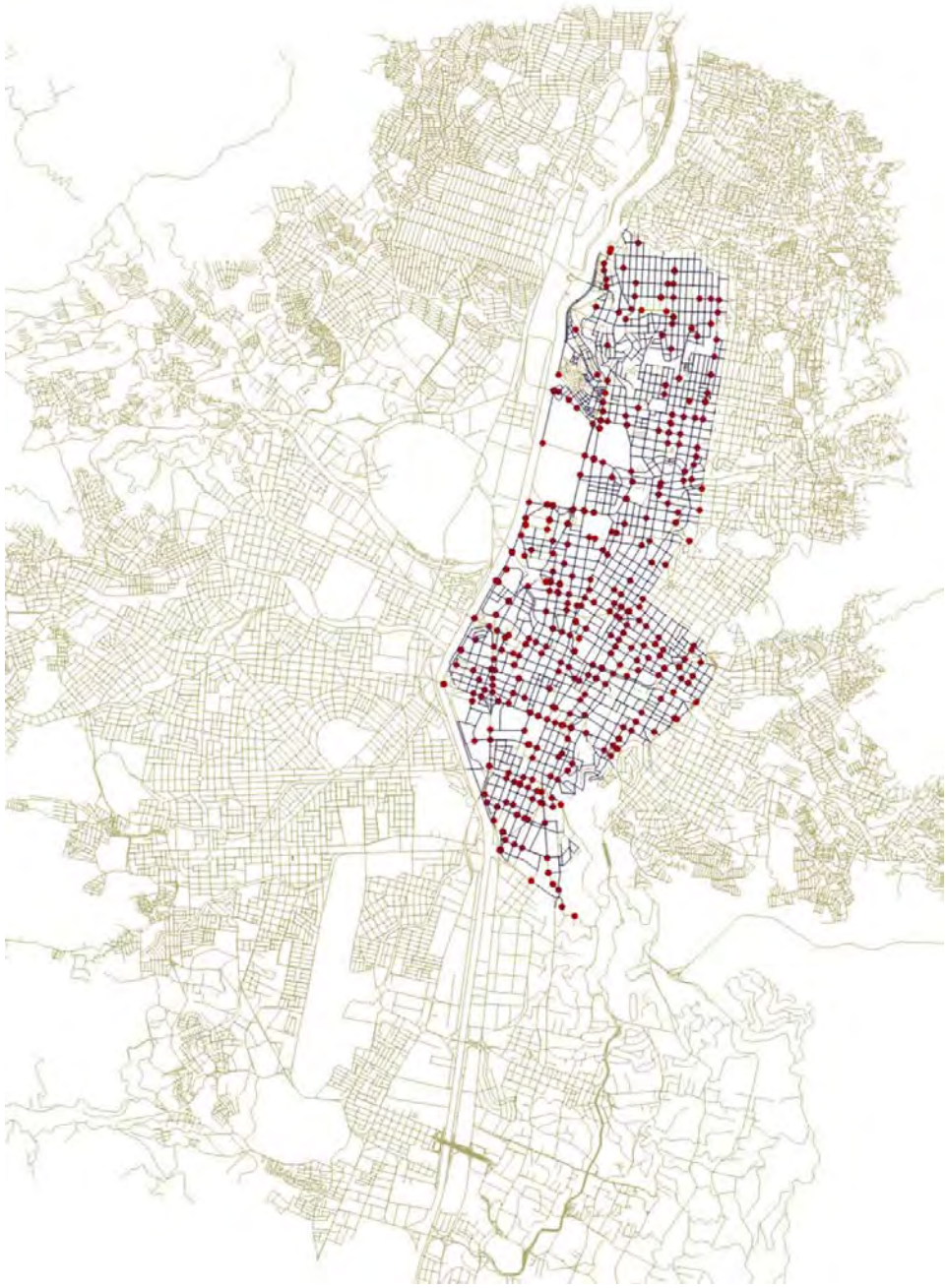
Using ArcGIS projected tools and Medellin City Hall supports the datasets were re-projected in the same reference system. Using the guideline provided by Medellin City Hall, the dataset was projected

in the reference system required by Medellin in order to make results useful. It is highly recommend to use the steps provided by the Medellin guideline to avoid from reducing the accuracy of the datasets.

However, we here note that converting the reference system of datasets can also be done using R package “sp” through spTransform command. For more information about “sp” package, see [5].

Current repository for fixed data.

The fixed dataset provided and used in this workshop are available through Github repository. We here only consider **injured accidents which have 472 points** (The entire dataset has more 42.000 accidents reported, included damage, injured and dead), and the street network was clipped to an area in the downtown of Medellin urban area.



https://github.com/GeoTecINIT/OpenData4OpenCities/tree/master/Spatial%20point%20analysis%20process/Open%20Data

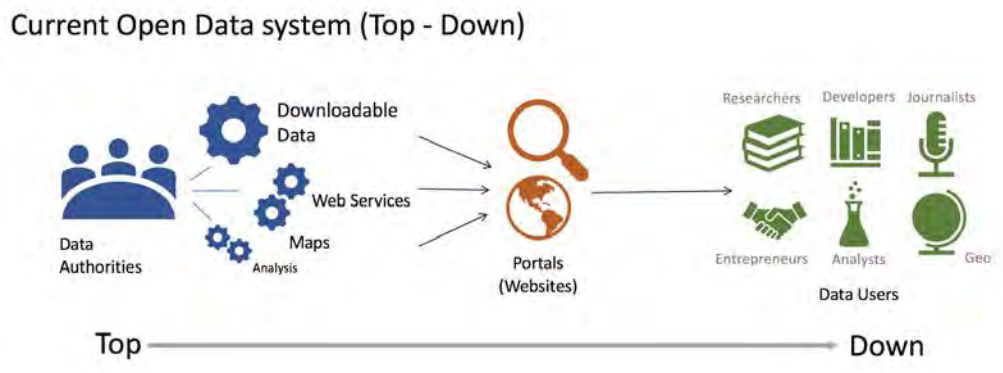
7. Wallpaper group activity

The wallpaper activity was part of the workshop as group activity to discuss three remain question in the initiative City Data 3.0 the research project related to Esr11 of Geo-C: enabling open Cities european project. Using three wallpapers with questions participants were consulted to place your preference, creating an interesting discussion now, with open data experts.

During the first stage of initiative city data 3.0, it was created an online survey to collected the data consumers barriers when they are looking and working with open data in cities. After this survey, the initiative can collect 195 valid responses around several questions about their perception with cities open data portals, barriers, most used features, most need formats and data quality criteria.
Through this survey, the initiative has a generic model of current obstacles and data consumers requirements. Developers and analysts were the most data users who replied the complete questionnaire.
Afterwards to compare what people say against what people do. The initiative created a set of the participatory workshop in a selected cities using only cities that got more responses (Bogota, Cali, Medellin in Colombia and Valencia in Spain) with more than 130 data consumers and data authorities for each city. Using the open data categories, we request to data users find open data and explain to data authorities why they are facing issues to access and reuse open data in their city. Collecting suggestions, and observing how data users find open data, those participatory workshops were an interesting opportunity to engage more data consumers with the current cities' open data initiatives and enrich the open data reuse discussion.

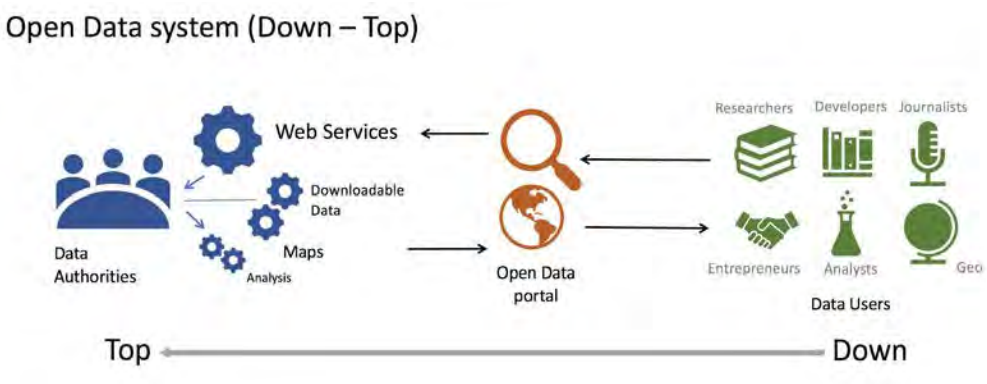
There are important aspects during this activity as following.

1. Discuss the current city open data system versus the city data 3.0 proposed scheme. Currently, cities have a Top-Down schema where all the requirements and services are thinking from data producer perspective. Also, many of cities are involved in an open data initiatives which aim is portals with Downloadable capacities.



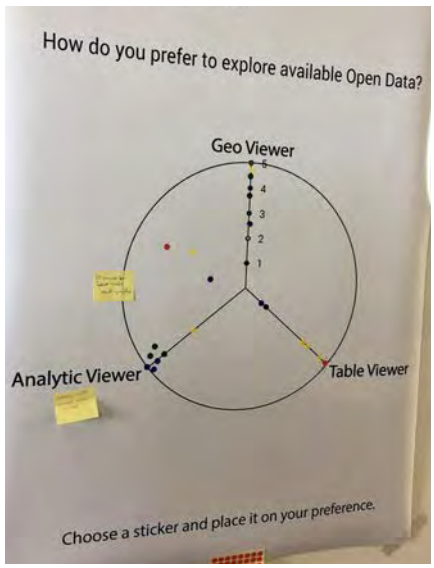
Is this current scheme the more suitable way to improve the reuse level of available services in a city?. Is clear that for analyst users having data in their hands is the way to create the analysis process. However, to improve the reuse level, the analysis results should be part of open data systems as a use case to demonstrate the open data capacity.
For developers and entrepreneurs that require a stable services connection, open data portals in

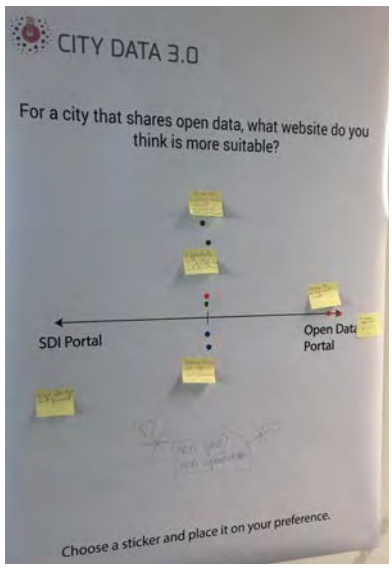
cities should focus on provided permanent and updated services in a circle open data system. Not only focus in deliver downloadable formats.



2. Another discussion topic showed in this activity was a common question in the participatory workshop in selected cities. Due to many of them already have spatial data infrastructure (SDI) portals which have been maintained for many years the was to make available data especially geo open data. The question here was if cities that share data should be put more effort to move the open data effort in creating an SDI, is the case of Medellin and Valencia, cities that are in the middle of open data initiatives but without considering any SDI, the other way around that Bogota and Cali are encouraged.

3. How data user prefers to explore available open data was another discussion topic, one of the most common issues mentioned by users was the way to explore data. Due to that, this question aim wants to know the preference among geo-viewer as web mapping application well know for many of SDI Portal, Analytic viewer new kind of viewer where user through charts and graphics can see the most relevant values of datasets or just the attributes table of published datasets.

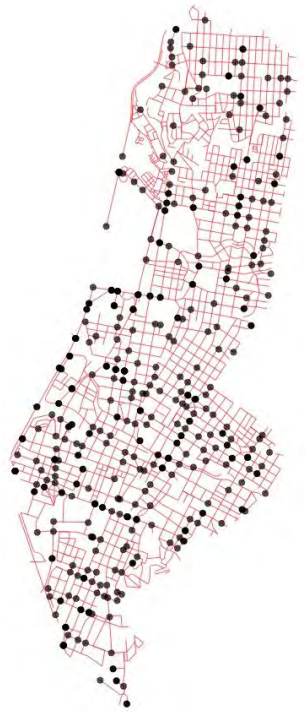




In spite of at the beginning of this activity was some confusion due to the questions displayed the participants presented their perspectives on those issues making emphasis in the following aspect to taking into account.

- Data user group: Academic, Entrepreneur, Analyst or Developer.
- SDI Portal and Open Data portal in a City might be a hybrid solution for open data users.
- Web services to improve the reuse is a good practice, but also the way to download dataset should an effective way in open data initiatives.
- Open dataset should have a context in the city, the current way to publish data as independent contend do not improve the understanding of open data and how it could be used

8. Spatial point processes activity



In this session, we aimed to get statistical insight into the traffic accident dataset from an area in Medellin (left Figure). The dataset is displayed in datasets used section so that any black point shows the location of a traffic accident in which someone has been injured and the red lines display the streets of Medellin, Colombia.

An accident investigator in the city hall might be interested in knowing the average of accidents per street (or a bunch of streets). Dividing the total number of points by the area of the survey region gives the average density of points per unit area. The average number of points per unit area can measure the abundance of traffic accidents.
However, the standard generic term is intensity. From the statistical point of view, such a pattern of points constitute a point pattern which is a realization of a point process.
Investigation of the intensity of a point pattern is one of the first and most important steps in such a data analysis. The intensity is a basic descriptive characteristic of a point process, an average (expectation) analogous to the average of a population of numbers.

In this session, we focused on estimating the intensity function of the traffic accident data of an area of Medellin, Colombia so that it can statistically disclose the streets with high/low intensity. In other words, estimating the intensity function enriches us to find the streets (or a part of street) that contains more/less accidents.

Current accidental indicator of Medellin Geo Portal show only the number of accidents by area or “Comuna” which is a descriptive indicator that can not help to prevent or get a better understanding of accident pattern. In dividing the total number of points by the total length of the city's street network, the accident investigator has effectively assumed that the spread of accidents is ‘uniform’ or ‘homogeneous’ while in reality it is not the case.
Homogeneity may be assumed if there is theoretical justification: for example, much of modern cosmology assumes that the universe is homogeneous on sufficiently large scales. However, in case

of accident data it is not a well assumption as we usually hear that most of accidents happen in some particular streets (or even a particular part of a street).

Thus, the assumption of homogeneity can not be considered while the number of accidents varies spatially. One of the interesting properties of inhomogeneity of intensity is that it can easily reveal the spatial variation in abundance of accidents.

When the intensity of accidents is spatially varying, it is effectively a function of spatial location, and we can use statistical methods to estimate this function from data. It might be also assumed as a weighted function by means of having a constant intensity per unit area. However, the importance of estimating the intensity function can be realized easier when we know the risk of having accident is not constant within a city´s street, i.e. there are usually streets with high/low risk.

Roughly speaking, a single point pattern such as the one shown in previous Figure cannot be perfectly homogeneous, since a point cannot be spread uniformly over the network. The only way to make rigorous sense of the assumption of 'homogeneity' is by thinking statistically.
Assuming the intensity function as $\lambda(u)$ in which u is an arbitrary location in the street network, then we can simply say that the expected number of accidents in a small part A (a small part of whole street network) as a small neighbourhood of the location u is approximately equal to $\lambda(u)|A|$ where $|A|$ is the total length of subnetwork A.

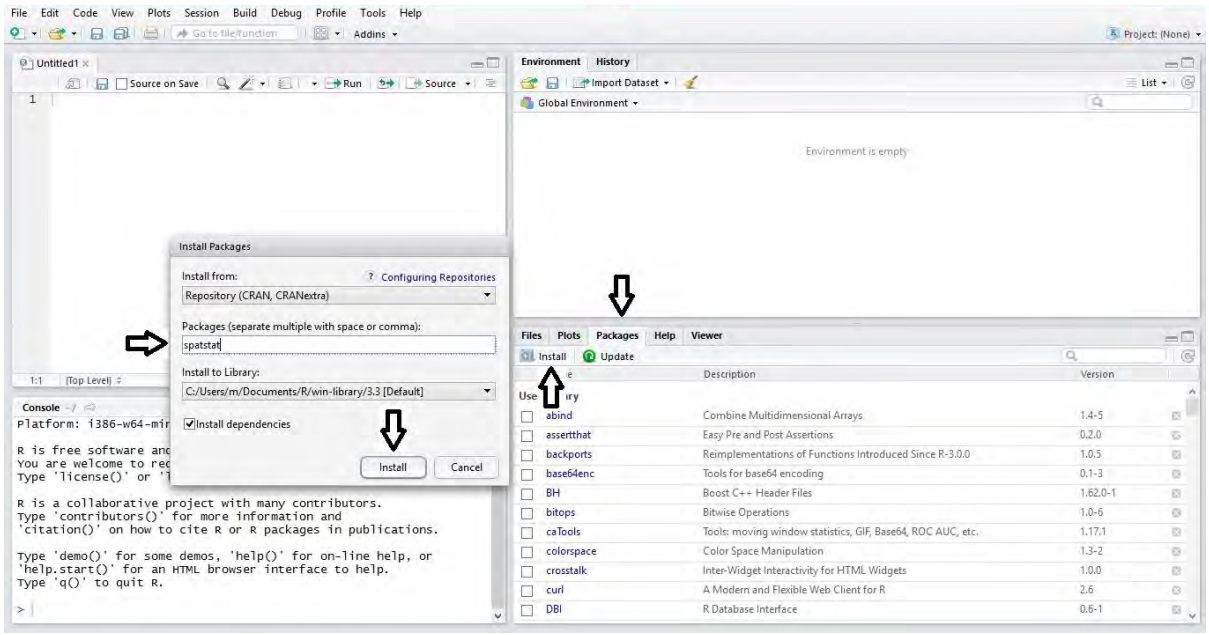
We then can divide any part of city's street to tiny pixels and measure the expected number of accident in any of them and adding up these expected numbers to obtain the expected total number of points in the corresponding part. We here in this workshop aimed to estimate the intensity function of the traffic accident data using kernel smoothing[1,2,3]. This statistical method can disclose the intensity of traffic accident data by analysing the neighborhood of locations within the street network. Most of this section has been taken from [2], more details can be found in [2,4].

It has been applied to the dataset using the open access statistical software R and RStudio which are free software environments for statistical computing and graphics. Moreover, we have used the R package "spatstat" which is a package for Spatial Point Pattern Analysis, Model-Fitting, Simulation and statistical Tests. For more details see [1].

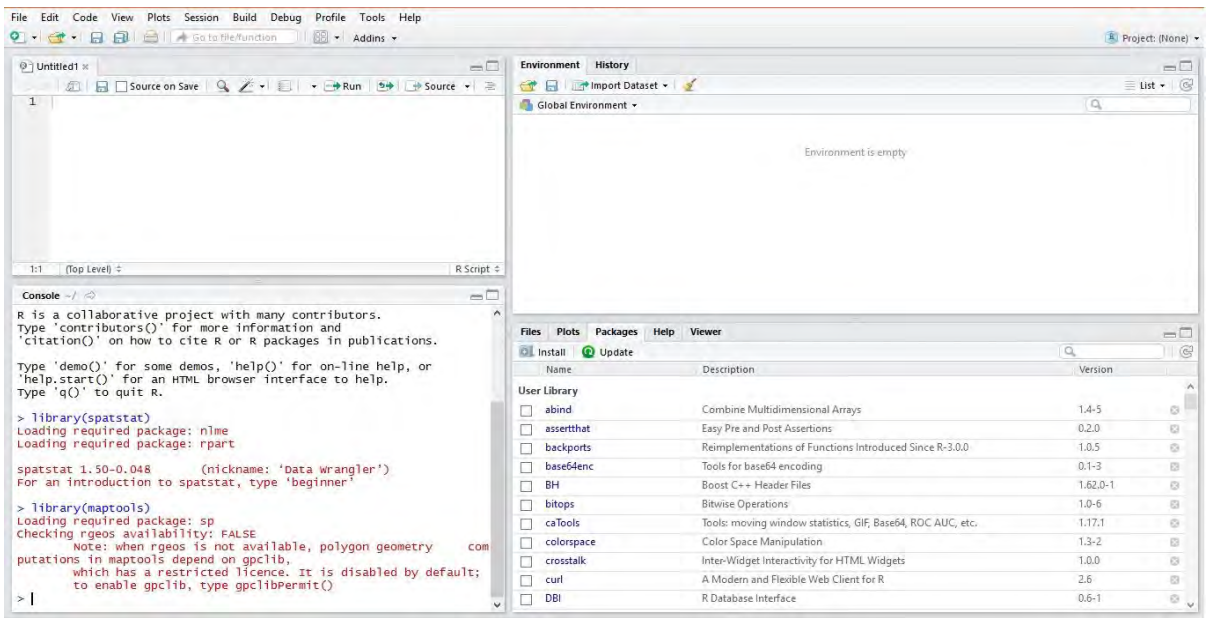
R and Rstudio can be easily downloaded from here and here, respectively. First, install R and then RStudio which is a set of integrated tools designed to help you be more productive with R. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace. After installing R and RStudio, open RStudio and follow the following steps in order to be able make sure you have access to both R packages "spatstat" and "maptools". More detailed steps are available in the Github repository mentioned in workshop resources.

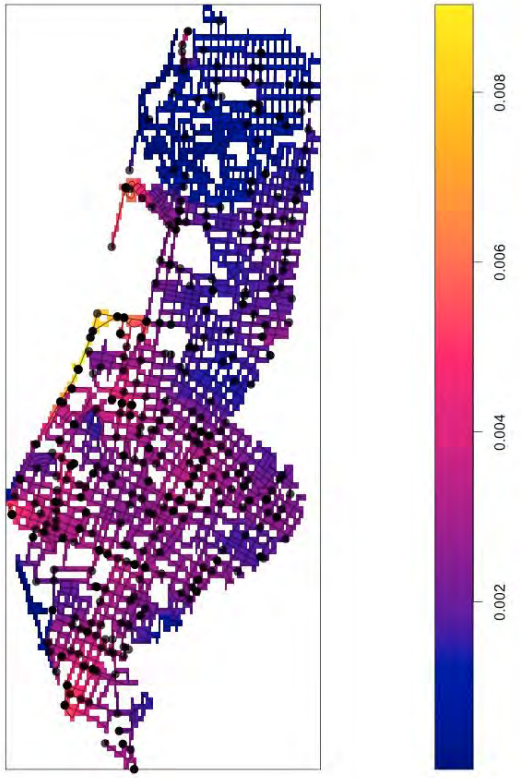
Installing the packages needed

- Open RStudio, go to Packages tab > Install > Type “spatstat” > Then Install. After follow the same steps to install “maptools” package.



- Call both packages using R code “library(spatstat)” and “library(maptools)”.





After installing the required R packages and in order to estimate the intensity function we have followed the idea in [3] and some R codes in R package “spatstat” [1]. The estimated intensity of traffic accident data has been drawn in left Figure as final result of this workshop.
The intensity function has been estimated through the kernel smoothing using heat kernel function in [3] and it is displayed on the Figure on left hand side so that any color exhibit the value of the intensity and it can be described that the higher the intensity, the bigger the chance of happening accident. Note that, the values on the bar shows the intensity value corresponding to colors.

In general, it shows that the intensity in south of this area in Medellin is higher than north. Moreover, the estimated intensity confirms the inhomogeneity of the distribution of accident locations.

To follow each step and get this result, find our Github repository aforementioned in the resources section. The entire analysis process is correctly described as a tutorial you can fork the repo and get the instruction and data used. All suggestions, corrections, feedback and collaborations are welcome.

9. Discussion

Measuring the impact of open data and its reuse level in cities is a complex topic. Nowadays, cities face a new challenge to demonstrate that open data initiatives are working in terms of collaboration, transparency, and participation especially that available data is begin used.

A better understanding of both data consumer groups and data providers help cities to deal with barriers and get more value of open data regarding re-use. Nevertheless, knowing barriers and benefits is not enough, both sides should move in the same direction to close the gap between the availability or accessibility and usability. To make open data worth, open data must be reused. Perhaps, the current view of open data system does not include the data user requirements and instead to create a dataset for data users, open data producer publishes datasets without knowing what exactly data reuser needs.

Thus, sometimes a set of Downloadable Data Portals and pool of services has been created only following the intention to begin part of open data movement. In the one hand, the way open data portals and open data initiatives has been thought may need to be modified and moreover studying and understanding data user requirements needs to be taken into account. In the other hand, instead of requesting only accessibility, data users need to be part of open data movement not only as a remote viewer but they also need to be part of the whole project and understand that their requirements are the core of the new open data system.
For instance and as a use case of this assumption in Medellin, Colombia, the authors of this report and GeoC project are supporting a data consumer group.

This group called Datos abiertos y gobierno abierto en Medellín, performs regular meetings with different data users from various backgrounds, the data authority (Alcaldia de Medellin). The aim of these meetings is to know all the details of the current open data initiative led by the city hall. Of their most notable achievements are a community with more than 400 users, inclusion of some members inside of open data city council. It shows that a community concerned and aware of the data can contribute to the city open data system.

Barriers and benefits in working with open data were the first topics presented by European data Portal (EDP). Heterogeneity, quality, metadata, availability were the barriers faced by European cities and explained by EDP representative taking into account that data producers and re-users have to deal these obstacles. Awareness was another data consumer barrier discussed, knowing what data users concern about and also their requirements can effectively make user communities more participatory and engaged.

Regarding benefits, it is still difficult to talk about the real and economic benefits for a city. EDP showed direct and indirect benefits for EU28+ countries and companies that use open data archive to increase new services, enhancing efficiency, reducing cost in terms of national scale, but it is still needed to determine the economic and social benefits in city level. Those benefits can motivate data authorities to improve awareness inside the local organization.

Based on the online survey initial finding related to how users get open data was presented a different open data system for a city, which using a Down-Top schema, the web services provided by open data authorities and users feedback are the main focus of the system, creating a circle system based on user requirements.

During this workshop, since presenters showed some accessibility barriers and also issues in terms of presenting the currents results had been found, possible future collaborations have come up. Marianna Sinno (Selected Paper No. 2) and Raquel Pozuelo (Selected Paper No. 3) are now in contact with the Italian and Spanish national open data portal representatives, thanks to supporting of our keynote speaker Heleen Vollers.

Finally, as a statistical application, we have considered an open data on the traffic accident in the city of Medellin, Colombia. The events happened on the street network, and it can thus be assumed as a realization of a spatial point process on a linear network. To find the dangerous streets in terms of the accident, we have applied the kernel smoothing using heat kernel defined by [2], and we found that location of accidents is spatially varying within the streets so that the estimated intensity in the south of the area in question is higher than the north.

10. Further outcomes

In collaboration with GeoGames AGILE workshop committee chairs, we currently have started publish an open access proceedings of the workshop in CEUR.org.
CEUR is a free open-access publication service of Sun SITE Central Europe operated under the direction of RWTH Aachen University. CEUR-WS.org is a recognized ISSN publication series, ISSN 1613-0073. CEUR-WS.org is hosted at
http://SunSITE.Informatik.RWTH-Aachen.DE/Publications/CEUR-WS/.
For more information and also finding published proceedings, please visit
http://ceur-ws.org/index.html

11. Acknowledgement

The authors of this report and workshop are gratefully acknowledge funding from European Commission within the Marie Skłodowska-Curie Actions, International Training Networks (ITN), European Joint Doctorates (EJD). The funding period is January 1, 2015 - December 31, 2018, Grant Agreement number 642332 — GEO-C — H2020-MSCA-ITN-2014.
We have to express out appreciation to Heleen Vollers, Capgemini Consulting and European Data Portal for sharing their new insights of the last analytic report, your participation as keynote speaker during the course of this workshop and all your ideas, suggestions and expertise.
We are grateful to [Alcaldía de Medellín, Alcaldía de Cali - IDESC, IDECA and Ayuntamiento de Valencia] who provided open data, their experience with open data and support in the last editions of this workshop.
We are also thankful to Adrian Baddeley and Greg McSwiggan for providing us the latest version of R package spatstat including the code to estimate the intensity function for spatial point patterns on linear networks using heat kernel.

12. Reference

[1] Baddeley, A., & Turner, R. (2005). Spatstat: an R package for analyzing spatial point patterns. *Journal of statistical software*, *12*(6), 1-42.
[2] Baddeley, A., Rubak, E., & Turner, R. (2015). *Spatial point patterns: methodology and applications with R*. CRC Press.
[3] McSwiggan, G., Baddeley, A., & Nair, G. (2016). Kernel Density Estimation on a Linear Network. *Scandinavian Journal of Statistics*.
[4]Okabe, A., & Sugihara, K. (2012). *Spatial analysis along networks: statistical and computational methods*. John Wiley & Sons.
[5] Pebesma, E., Bivand, R., Pebesma, M. E., RColorBrewer, S., & Collate, A. A. A. (2012). Package 'sp'. *The Comprehensive R Archive Network*.

INTERNATIONAL SCIENTIFIC EVENTS (ISE) REPORT

GENERAL INFORMATION

Scientific Event Organized | Pre-conference Workshop *"Opening Smart Cities: Challenges to engage citizens through information systems"*	**At the** | 25th European Conference on Information Systems (ECIS), Guimarães, Portugal
	Date | 6th of June 2017
	URL | http://geo-c.uji.es/blog/2017/03/07/cfp-workshop-ecis2017-opening-smart-cities-challenges-to-engage-citizens-through-information-systems/

ISE ORGANIZERS |

FROM		
NOVA IMS Lisboa	**University of Münster (WWU)**	**Universidad Jaume I (UJI)**
ESR 04: Albert Acedo Sánchez ESR 05: Mijail Naranjo	ESR 13: Mehrnaz Ataei ESR 03: Ana Maria Bustamante ESR 01: Guiying Du	ESR 15: Manuel Portela ESR 06: Khoi Manh Ngo

PEOPLE REACHED |

No. of Participants	Organizations reached
10	University of Warwick, UK // University of Portsmouth, UK // University of Fort Hare, South Africa // Beirut Arab University, Lebanon // Tokyo Tech University, Japan.

COSTS|

Registration Fee	Accommodation	Transportation	TOTAL
€ 2,180.00	€ 926.00	€ 993.50	€ 4,099.50

SUMMARY OF ISE "OPENING SMART CITIES" PRE-CONFERENCE WORKSHOP |

Goal|

The workshop aimed to allow a space for the participants and organizers to reflect in current smart cities practices and their challenges, and possible ways to address them. It was particularly emphasized by the call that the participants consider and proposed over the importance of effective citizen engagement strategies and platforms within the smart cities' context.

Preparations |

We have worked together in the integration of research topic of each ESR for the workshop proposal. With a consistent proposal we applied to different conferences, among which it was selected in two conferences, ECIS and CISTI. We decided to go for ECIS as it has a higher standard and it was more relevant to the topics proposed for the workshop.

Methodology |

As prior activities for the workshop we did a call for application were potential participants were encouraged to submit position papers about this particular topic. The selected papers were presented during the first part of the workshop to provide participants with some material about the overall framework of the participants' work, as well as to serve as material for the discussion and serve as basis for the ideation session.

In the second part, a brainstorming session was held, where participants were divided in two groups to discuss a topic that they choose among three: 1) "IoT & Privacy in smart cities", 2) "Openness in smart cities: challenges and impact", and 3) "Sense of place to promote participation in smart cities". Group 1 selected topic No. 2, and group 2 choose topic No. 3. The objective of the brainstorming session was to come up with a more in-depth dialogue and propose creative ideas to approach each of these topics. To achieve this goal and incentivize these type of ideas we used two gamestorming techniques: "the anti-problem" and "the visual agenda". During the brainstorming, both teams came up with similar issues regarding cities, like isolation, exclusion or lack of participation.

In general, the exercise helped participants to understand how taking a problem to an extreme situation can help to avoid personal assumptions and to propose better solutions. It also allowed them to realize that social problems sometimes have easier ways to be solved with or without technological solutions in a problem-first approach. In terms of smart cities, the workshop provided a space to include more social concepts closer related to a citizen-centered approach. The workshop supported views about the smart cities strategies which first included the citizens' feelings and observations for their urban territory, as well as their possibility to create, re-use, and modify aspects of it ("openness") related to public policy, infrastructure, among others. The overall outcomes and views from the workshop were presented by each to the other participants at the end of the session.

For the ESRs team, the learning can be accounted in the teamwork during the preparation of the workshop, submission and selection process. The review of papers also implied to be open to new ideas and to evaluate the work of other scholars. For some of the members, also was an important learning the opportunity to test different methods for brainstorming.

Images from the workshop "Opening Smart Cities"

ESR Workshop report

Joint Doctorate in Geoinformatics: Enabling Open Cities

Diego Fabian Pajarito Grajales

ESR 07: Mobile Services For Green Living

Supervisor: Michael Gould

Co-Supervisors: Christian Kray – Tiago Oliveira

Workshop Report

May 22nd, 2017

This report briefly describes the activities and outcomes from the workshop on geogames an geoplay co-organized between Geo-C ESR7 and the geogames team of University of Bamberg at the 20th international conference on geographic information science - Agile 2017 it Wageningen, The Netherlands, on May 9, 2017. Additional information about the workshop is available at the web site http://www.geogames-team.org/agile2017/.

Organizers

Organizers of the workshop were the Geogames team from University of Bamberg and GEOTEC research group from Universitat Jaume I. Prof. Dr. Christoph Schlieder, Diego Pajarito and Thomas Heinz leaded the foloowing tasks: definition of the focus topic "Geogames for open smart cities", web page setting, call for papers, notification to authors and proceedings of and reports.

The program committee of the workshop had the following members:

Christoph Schlieder [University of Bamberg, Germany]

Mike Gould [University Jaume I, Castellon, Spain]

Diego Pajarito [University Jaume I, Castellon, Spain]

Ola Ahlqvist [Ohio State University, USA]

Thomas Heinz [University of Bamberg, Germany]

Peter Kiefer [ETH Zürich, Switzerland]

Vyron Antoniou [University of Athens, Greece]

Participants

Participants registered to the workshop are listed below:

- Sven Casteleyn, Spain
- Johan Boye, Sweden
- Henk Kramer, Netherlands
- Diego Fabian Pajarito Grajales, Spain
- Thomas Heinz, Germany
- Olga Yanenko, Germany
- Michael Gould, United States
- Francisco Ramos, Spain
- Musa Dukureh, Netherlands
- David I. Schwartz, United States
- Christoph Schlieder, Germany
- K. Kavisha, Netherlands

Agenda

The agenda had three main sections, an introduction for the geogames research agenda, paper presentation, and a hands-on session. Each of the sections aimed to provide a discussion environment where participants could get involved and participate according to their research background.

The introduction briefly described the current research status of geogames, its increasing relevance not only for geographic information sciences, but also for education and industry. The Five selected papers explored a wide range of concepts associated to geogames, from the use of the serious games approach for gathering critical spatial thinking and an agent-based simulation framework for geogrames, to the description of three available geogames (NavApps, Smart Beetles, and BioDiv2Go).

Hands on Session

The hands-on session aimed to provide participants a closer view of the geogame design process and a real experience when playing. Participants discussed about the experiment design aiming to test the promotion of urban cycling using gamified tools, a proposal from Diego Pajarito's Geo-C research. Finally participants were invited to play "neocartographer", a tailored tic-tac-toe version developed by University of Bamberg.

The discussion about the experiment design had positive comments and suggestions from the audience, they are listed as follows:

- A clear definition of engagement is needed for establishing the success of the experiment
- To define the owner of the platform (the city, a cyclist association or a private company) will help on a better perspective of the experiment.
- It is necessary to stablish the final goal of the gamified application; this goal will also define the goal of the experiment.
- It is necessary to identify all possible wining strategies to balance them and do not allow extreme users to easily win.
- The use of tags could derive in undesirable results, a pre-defined list of tags could help on simplify the experiment and control bias.

Main outcomes

The workshop allowed new members to join the research community, they shared their ideas and exposed their own challenges and plans. The discussion covered not only technical details about mobile development and data analysis, but also existing and new fields of applications. The chances of generating new synergies were positive accepted by all participants and the idea of submitting a proposal for a future European project, like a COST action, was considered as the next step.

For the GEO-C project, and specially for the ESR7 research project, the feedback received will feed not only the experiment design but also the Ph.D. research. New joint tasks like experiment replication at different places or the use of the testing framework were proposed and will be evaluated.

Future Works

After the workshop a set of tasks are needed to strength the relationships with new contacts, then papers and presentations will be published at the workshop website, a visit to the geogames team at Bamberg will be planned and finally the options of co-organize the next workshop will to be evaluated.

Costs

Associated costs of organizing and attending to the workshop are listed below:

- Conference Registry 260.0
- Workshop Registry 60.0
- Hotel 285,2
- Travel Cost (Train + Bus) 66,55

References

Following are the papers selected for being presented at the workshop.

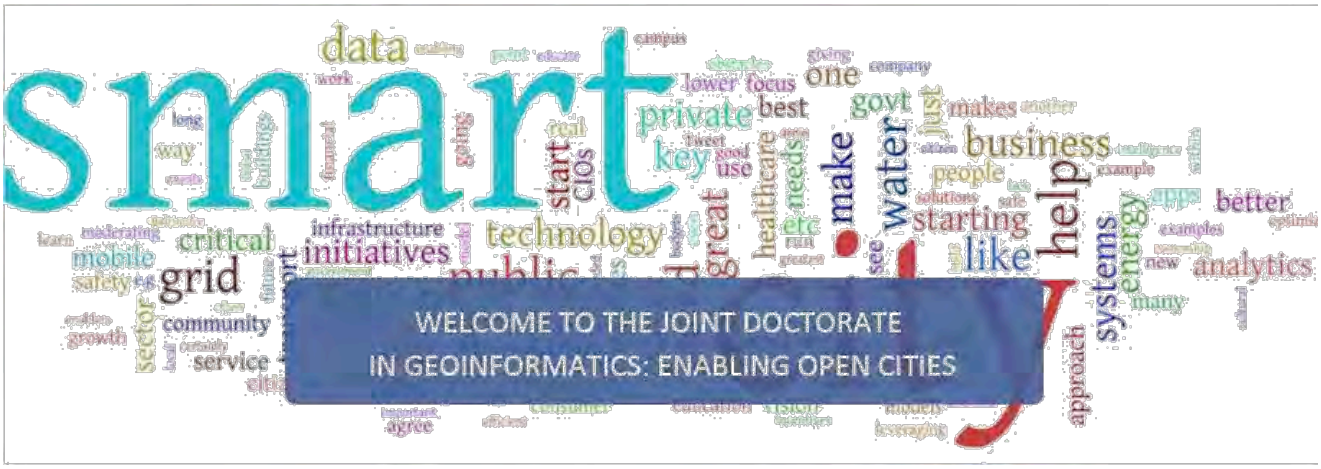
[1] Yanenko O., Stein K., Klug C., (2017). *Challenges in Geogame Design for Biodiversity.* Available at: http://www.geogames-team.org/agile2017/submissions/Biodiversity%20Education_AGILE_2017.pdf

[2] Tomaszewski B., Schwartz D., (2017). *Critical Spatial Thinking and Serious Geogames: A Position.* Available at: http://www.geogames-team.org/agile2017/submissions/Critical_SpatialThinking_AGILE_2017.pdf

[3] Ramos F., Miralles N., (2017). *Smart Beetles: towards a Geogame for Smart Citizens*. Available at: http://www.geogames-team.org/agile2017/submissions/Smart_Beetles_AGILE_2017.pdf

[4] Frias D., Monfort A., Casteleyn S., (2017). *NavApps - A mobile game to reinforce spatial literacy for secondary school children.* Available at: http://www.geogames-team.org/agile2017/submissions/NavApps_AGILE_2017.pdf

[5] Heinz T., (2017). *Location-based Game Design Pattern Exploration Through Agent-Based Simulation.* Available at: http://www.geogames-team.org/agile2017/submissions/Pattern_Exploration_AGILE_2017.pdf



WORKSHOP REPORT

JOINT DOCTORATE IN GEOINFORMATICS: ENABLING OPEN CITIES

GRANT AGREEMENT NUMBER 642332 – GEO–C – H2020–MSCA–ITN–2014

Spatial–Temporal Predictive Modeling with Open Source and Open Data for Urban Areas Kick – off Workshop

The Association of American Geographers at the AAG Annual Meeting in Boston, April 5–14, 2017

Organizers of the event

Shivam Gupta (ESR 08)
Rustam Kamberov (ESR 14)
Fernando Santa (ESR 10)
Marek Šmíd (ESR 09)

Topic & work done during the event

The half–day workshop was aimed as a collaborative exercise, which extends on-going research for developing open smart cities, using open data and open source statistical and GIS tools. Also, to provide a comprehensive but digestible introduction to the most common methods of analysis and geomatics work–flows which are nowadays often encountered when tackling various issues in urban agglomerations. Given a multi–tiered nature of contemporary web applications, we propose an interactive session devoted to an R-supporting middleware, as well as the of statistical packages for popular web frameworks. The exercises were in the form of examples from fields of air pollution, climate, and transportation among others.

Place & date

During April 5–9, 2017, the John B. Hynes Veterans Memorial Convention Center located in Boston was the venue of the AAG (Association of American Geographers) Annual Meeting. Our presentation took place at room Beacon B on the third floor of the Sheraton Boston Hotel on Thursday, April 6, from 9:00 a.m. to 1:00 p.m.

Estimated number of people reached

We planned the workshop for having up to 25 participants. Finally, we had 17 attendees to the activity, main people coming from universities and public sector.

Costs

Concept	Gupta, S.	Kamberov, R.	Santa, F.	Smid, M.
Visa	€420.60	€156	--	€14
Inscription	$244	$244	$244	$244
Flights	€617.66	€906.27	€1138	€1098
Hotel	€917.28	$1679.31	$964.3	$976

Summary of the learning experience

- Communication skills

  All aspects of the communication were tackled responsibly. We communicated with the staff of AAG and with the participants. We also contributed on marketizing of the event via social media – Facebook and Twitter.

- Working in team

  The teamwork appeared as one of the most challenging aspects of the workshop organization. Due to different professional and cultural background of organizers and the fact that we were in the different countries and time zones, all the processes (splitting the work or reaching agreements) were exhaustive. The main lesson learned was the patience.

- Working under the pressure

  Since most of us were in exposed period even without all the workshop related tasks, the pressure was on. Such a workshop requires being prepared to all the alternatives (e.g. adjust the content in dependence upon the audience technical expertise and immediate demand). In the end, we were able to proceed flawlessly with the foreseen plan. Due to the heterogeneous background and expertise of our workshop team members, we managed to answer all questions received during the workshop.

- Networking

  Multiple participants asked for the contacts and expressed their interest in possible future collaboration. Furthermore, we all took and advantage of such a large event and strengthened our personal network by meeting our already existing contacts from inside and outside of GEO-C network. We also had a chance to attend a plenary session with Noam Chomsky, a world famous philosopher, scientist and political activist.

URLs related to the event

http://www.aag.org/
http://www.aag.org/cs/annualmeeting
http://www.aag.org/cs/annualmeeting/schedule_and_program/field_trips_workshops/workshops
http://geo-c.uji.es/blog/2017/03/10/spatial-temporal-predictive-modeling-with-open-source-and-open-data-for-urban-areas-workshop-aag-workshops-2017/

International Scientific Event (ISE) – Report

Organizers
Mijail Naranjo (NOVA University of Lisbon)
Guiying Du (University of Muenster)
Khoi Manh Ngo (University Jaume I)

Workshop topic
E-participation in the urban planning process: challenges to be addressed by Information and Communication Technologies

Conference: International Conference for E-Democracy and Open Government 2017 - CEDEM 2017.

Place and date: Krems an der Donau – Austria / 17-18-19 of MAY-2017 (Workshop day: 18-MAY-2017)

Duration: 90 minutes

Number of attendants: 12

Costs: 2000 euros approximately (Transportation + Hotel + Conference registration + Food) for all the organizers together during the conference.

URLs of conference proceedings: http://www.donau-uni.ac.at/en/department/gpa/telematik/edemocracy-conference/edem/vid/23864/index.php?URL=/en/department/gpa/telematik/edemocracy-conference/23864&cursor=6

http://geo-c.uji.es/blog/2017/05/25/geo-c-cedem2017-e-participation-in-the-urban-planning-process-challenges-to-be-addressed-by-ict/

Work done:

1. Workshop planning and designing during February and March 2017.
2. Workshop submission to the conference CEDEM 2017 on 29-MAR-2017.
3. During the workshop:
    a. Introduction of the organizers and the project GEO-C
    b. Explanation of the tasks in the workshop and provision of the materials (Lego blocks).
    c. Simulation of an urban planning scenario and then asking the participants to provide comments about how that process can be carried out using e-participation.

Summary of the workshop

The backgrounds of the participants were very diverse, practitioners and academics on the fields of e-government and e-participation. In the urban planning exercise, the participants represented today's common issues using Lego blocks and proposed solutions. Those solutions were written down by keywords and the pinned on the boards. The participants came from different countries and they share their experiences in each country regarding the way they manage the problems of urban planning.

Several issues/questions regarding the use of e-participation were discussed:

- Who judge who participates online?
- Accept or not external opinion
- ID confirmation
- E-participation visualization challenges for policy-making and law-discussion.

- Mixing online and physical participatory meetings.
- How ICT can address e-participation challenges?
- E-participation provide transparency, citizens can monitor public agencies.

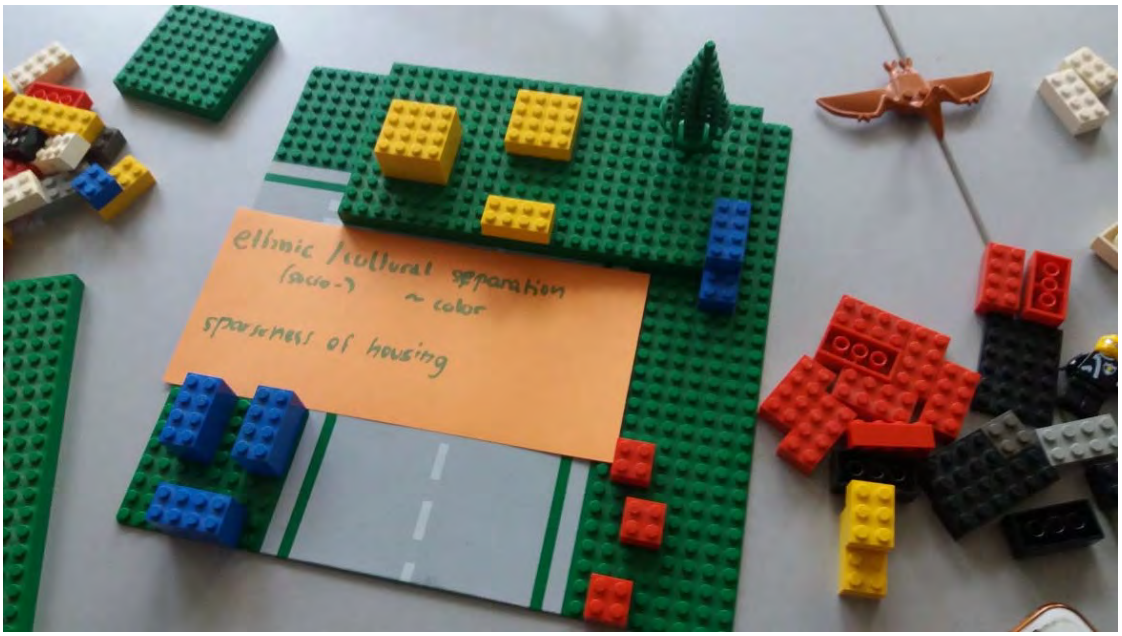
The workshop lasted only 90 minutes, the time passed very quickly and we had to merge some tasks on the way. Even though we displayed a countdown clock for each task, some participants exceed the given time because they spend too much time in the discussion. We divided the 12-participants group in 4 small groups of three, this worked fine, but at the end we requested to them all build a city together using the Lego blocks, not all participants wanted to join. The use of Lego blocks, directly or indirectly related with e-participation, resulted an effective instrument to motivate the participation, break the ice among participants, and make the session more fun. All the participants agreed on the importance of improving and spurring the e-participation systems.

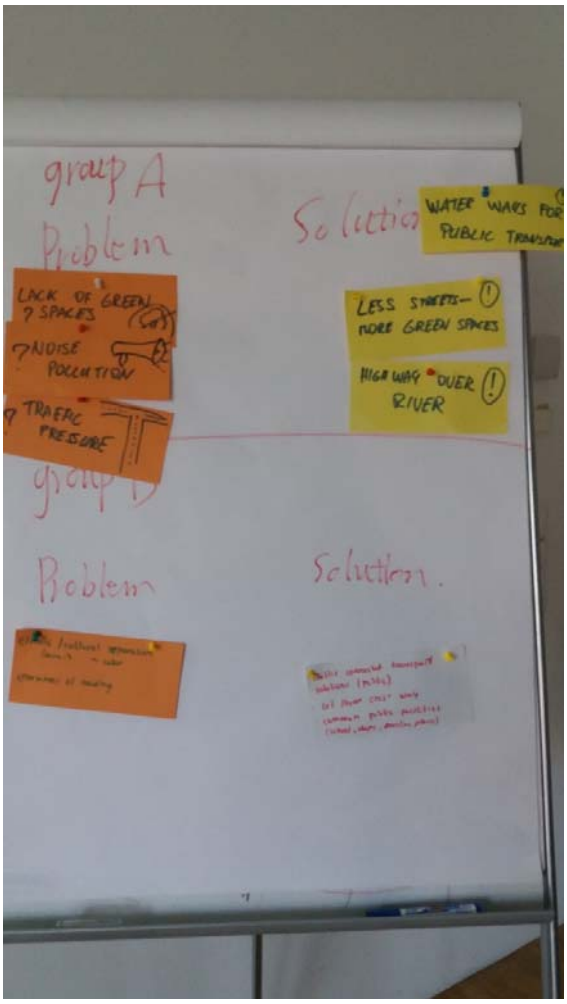
Learning experience and future career

Several lessons can be derived from this workshop. First, the topic of the workshop must be attractive and clear, so we can guarantee a proper number of attendees. Second, to make the participants being involved in the workshop activities Lego blocks helped, which is a non-traditional form of presenting a workshops, that usually are managed by presentations. Third, time control is very important not only for organizers, but also for participants to be aware of the remaining time.

The most important skill improved thanks to the experience in this scientific event is to be able to organize international events and meetings, also the team work between the three organizers remotely managed was an enriching experience. In our future careers we expect to participate in the organization of such events.

Pictures of the event


ethnic / cultural separation
(socio-)
~ color
sparseness of housing


group A
Problem
Solution
WATER WARS
PUBLIC
LACK OF GREEN SPACES
NOISE POLLUTION
TRAFFIC PRESSURE
LESS STREETS — MORE GREEN SPACES
HIGH WAY OVER RIVER
Problem
Solution.