COST Action TU 1306

cyberparks

Fostering knowledge about the relationship between Information and Communication Technologies and Public Spaces supported by strategies to improve their use and attractiveness

E. S. MALINVERNI, R. PIERDICCA, C. SMANIOTTO COSTA, A. BAHILLO MARTÍNEZ, E. MARCHEGGIANI

UNIVERSITÀ POLITECNICA DELLE MARCHE

UNIVERSIDADE LUSÓFONA de Humanidades e Tecnologias
Humani nihil alienum

DeustoTech
Deusto University, Bilbao.es

Main objective

is to create **a research platform on the relationship between information and communication technologies (ICT) and the production and use of public open spaces**, and their relevance to sustainable urban development.

The impacts of this relationship will be explored from social, ecological, urban design and methodological perspectives

Leading questions

'How can ICT contribute to attract more users to engage with public spaces more efficiently, enhancing their health and wellbeing?'

'How can ICT contribute to a better understanding of needs and requirements on public spaces from users' perspective?'

A **cyberpark** is a new type of urban landscape where nature and cybertechnologies blend together to generate hybrid experiences and enhance quality of life.

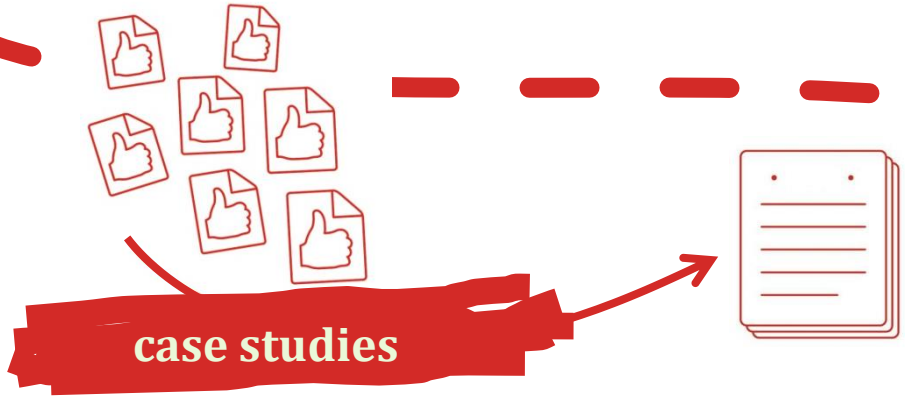
advance knowledge to be used in policies, research, design and space production in order to respond with sustainable and inclusive urban places

Goals

- Coordinate and enhance research efforts in how to deal with ***opportunities and/or risks* of ICT usage in public spaces**, and the meaning for *design practice*,
- Enhance and test **research methodologies into a new context**, considering the *social function of public spaces*,
- Establish links and promote **collaboration among experts and expertise areas**, e.g. ICT, creative industry, design practice, health consultancy.
- Form self sustained **empirical knowledge** on use of ICT by place users, and via experimental research gaining empirical knowledge and synthesising the impacts of ICT on public spaces into a **set of guidelines for city planners, urban developers, urban policies, regulatory and decision-making bodies.**
- Synchronise **academic and industrial research** that may result from the intersection of ICT and public space and their relevant users, (and therefore promote existing and establish new links with industrial partners in new commercial applications).

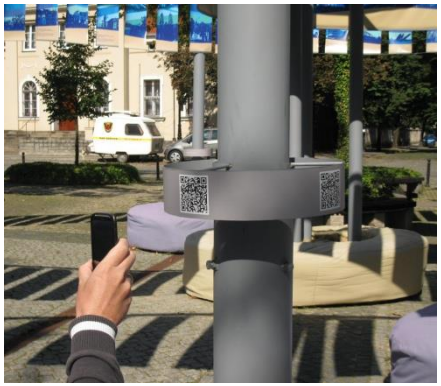
Scientific focus

- Analysis of examples of the **intersection of ICT with public spaces**,
- Analyses of **case studies** (urban parks and green spaces in selected cities),
- Identification of **knowledge gaps** and the development of novel approaches to close those gaps (from COST actions, national and international research other European programmes),
- Identification of the **role of ICT for the production and use of public spaces**, and the way to introduce them into goals of European policies on technology, urban development and creative industries.



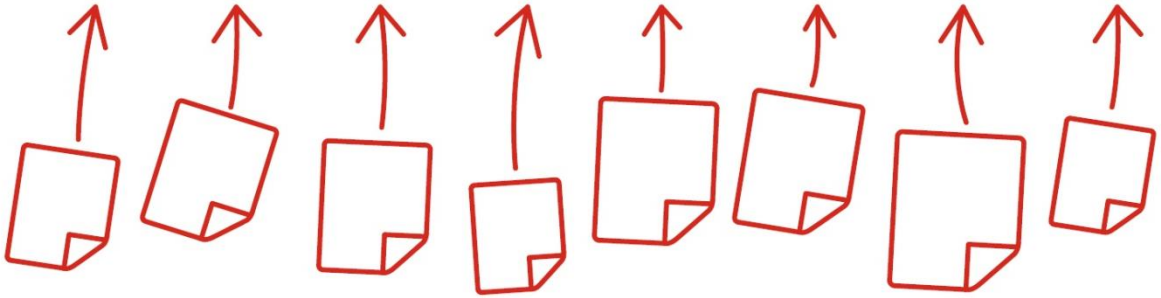
Analysis of **case studies** based on comparative cases supported by on-going research of partners and some *field experiments*

Examples of intersection ICT & Public Spaces



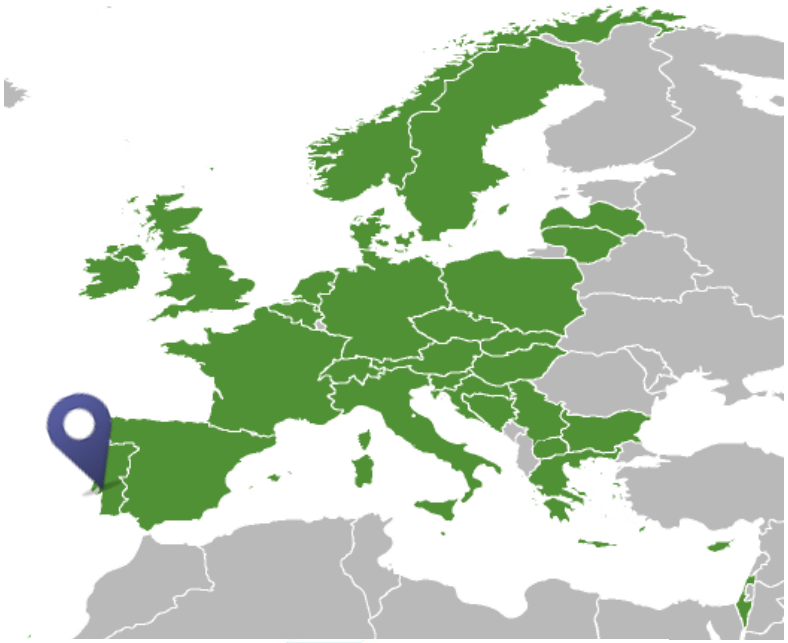
Target groups/end users

- **Scientific community** including Early Stage Researchers
- **Decision makers** (policy and practice)
- **Landscape architects & urban designers**
- **ICT specialists**
- **ICT users & public open space users - urban park users** (8-80 concept) CyberPark will take account of the variety and intensity of potential uses and users' groups (children, young people, pupils and students, active citizens, elderly, etc.) and not a preferable standard based approach - as in the current praxis of production of public space.



Participants' expertises & Networking

87 participants ■ 30 countries
(as of January '17)



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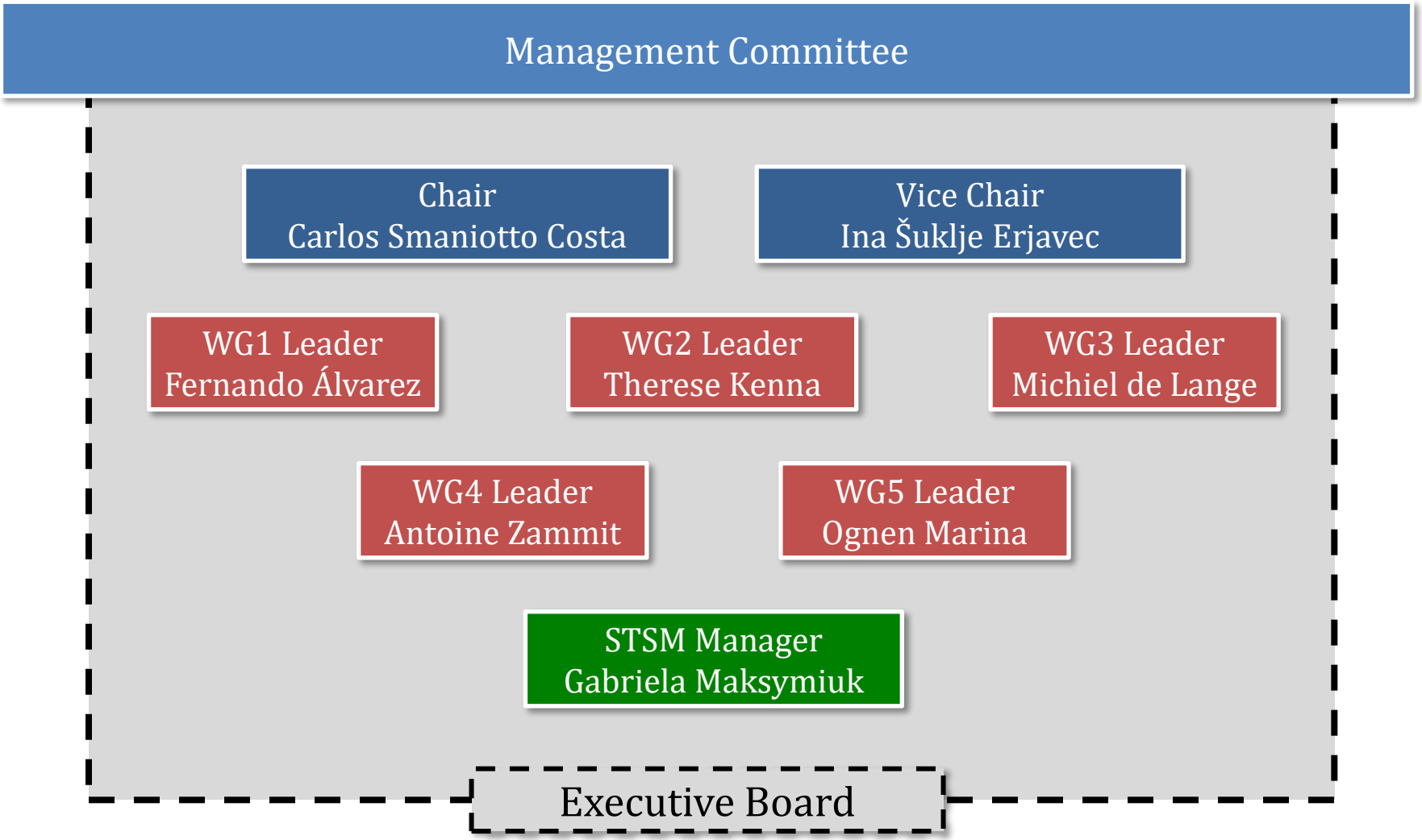
Lisbon – Portugal
CeiED Interdisciplinary Research Centre for Education and Development
Carlos Smaniotto Costa – Action's Chair
smaniotto.costa@ulusofona.pt

- Urban management and development
- Landscape design and planning
- Sociology/anthropology/behaviour research and public health
- Education/psychology/minority research
- Marketing/communication sciences
- Creative/cultural industries/economic promotion
- GIS / planning / geography
- ICT / computer sciences / development
- Participatory planning
- Urban gaming / cyber art
- Engineering / mobility
- Environmental sciences

Working Groups

Distribution of Tasks



Working Groups

WG 1 - Digital methods

How can we use ICT and new media technology to enhance our understanding of the uses and users of public spaces?

What can we learn about public spaces through the use of tracking technologies or scraping public data that users of public space have produced?

WG2 - Urban ethnography

What is known about the relationship between new media use and spatial practices?

What do people want from public space? How this differ by socioeconomic status, gender, age?

What technological developments are most likely to enhance current user behaviour or develop new user behaviours?

WG3 - Conceptual reflection

What can we learn from links between digital media in public spaces? **Are new media practices changing the character, meaning, significance and functions of public spaces?** What new possibilities new media offer for public spaces future development and design, and what are the problems and obstacles they are bringing?

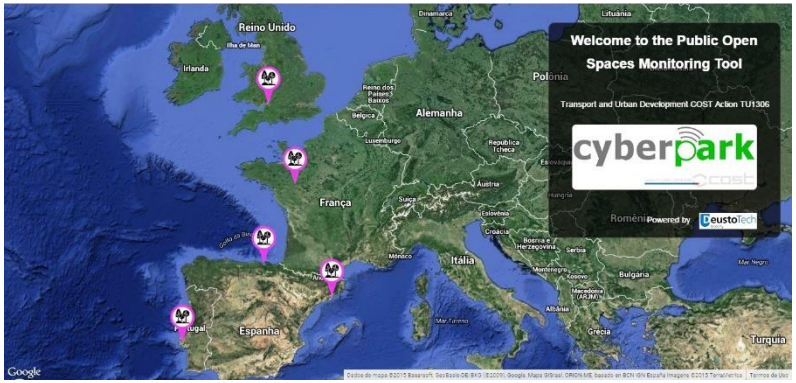
Working Groups

WG 4 - Creating CyberPark
How do ICT challenges the design of public spaces?
What could be the added value of the new technologies for inclusive public spaces?
How can designers operate on these conclusions in the production of public spaces**?**
What is the contribution of various disciplines and how should they work together in the process of making better public open spaces?

WG 5 – Networking & dissemination
is in charge with the **dissemination strategy** for tailoring and transferring knowledge, contacting interested persons and organisations (policy makers, internet service providers, legal experts) and the **legacy plan** with research perspectives and follow ups.

WG1 > Monitoring Tool WAY CyberParks

Mobile app + Web + Cloud application > to track and display how people use public open spaces



LOADING WORK IN PROGRESS

WG 1 - Digital methods

How can we use ICT and new media technology to enhance our understanding of the uses and users of public spaces

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Case Studies

- Lisbon.pt ▶ Parque da Quinta das Conchas & Mouraria
- Barcelona.es ▶ Fòrum de Les Cultures & Carrer d'Enric Granados
- Bristol.uk ▶ open spaces in the city centre
- Antwerp.be & Ghent.be ▶
- Thessaloniki.gr ▶ Training School Enhancements - New Waterfront Garden
- Malta ▶ Valletta & Msida

WG1 > Monitoring Tool WAY CyberParks

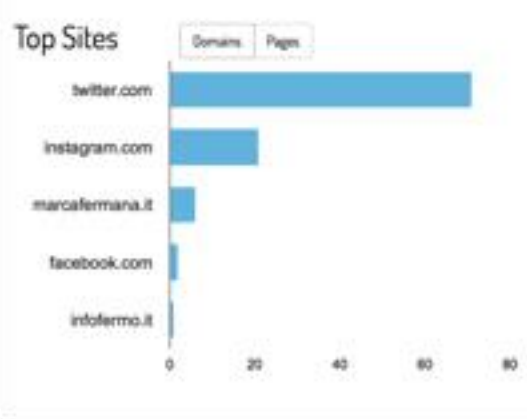
- Navigation through the map, zoom in/out, see the active points od interest (POI), get information from them, and explore the POI with street view;

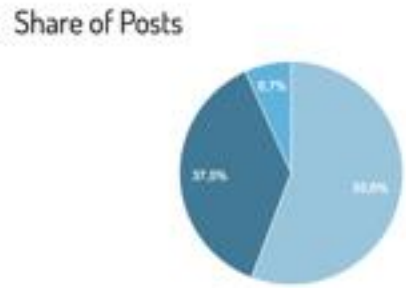
- Select the users that fulfill a specific criteria, and visualize them on the map;

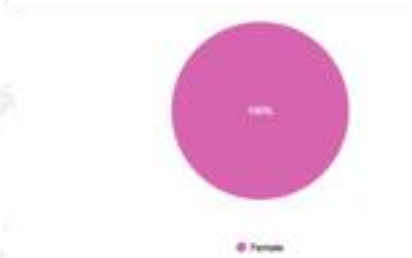
HOW CAN WE COLLECT INFORMATION FROM THE USERS?

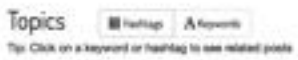
DIGITAL FOOTPRINTS AND USER GENERATED DATA

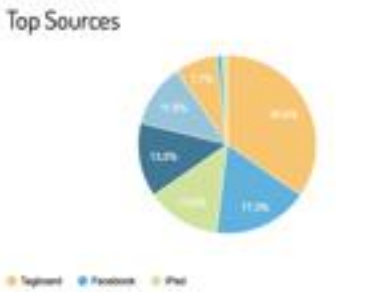
Digital footprints and geolocalization











Are CyberParks Senseable Spaces?

Public Open Spaces as ***Senseable Spaces***

CyberParks' main objective is to create a research platform on the relationship between Information and Communication Technologies (ICT) and the production of Public Open Spaces, and their relevance to sustainable urban development. The impacts of this relationship will be explored from social, ecological and urban design perspectives. ICT is a driving force, media and tool, which operates as a mediator between users and their virtual and real worlds.

USERS

VISITORS/TOURISTS

Interactive visit of a Public Open Spaces
Improved way finding
Improved access to not accessible areas
Creation of a participatory environment

PLANNER

Improve tourism attractively
Promotion of Points of Interest
Digital Footprints and User Generated Data analysis
Improve the decision making process

WG1 > Park in the City – **CyberCardeto**

parco Cardeto
Franco Scataglini

cost
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

UAB Universitat Autònoma de Barcelona

Universidad de Deusto
University of Deusto
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Centro di Ricerca e Servizio sul Paesaggio

WG1 > Park in the City – **CyberCardeto**

Direction and Scientific supervision
prof. Eva Savina Malinverni,
Prof. Andrea Galli

Scientific and Technical coordination
Roberto Pierdicca, PhD
(Università Politecnica delle Marche, Italy)
App CyberCardeto developed by
48h Studio Soc. Coop

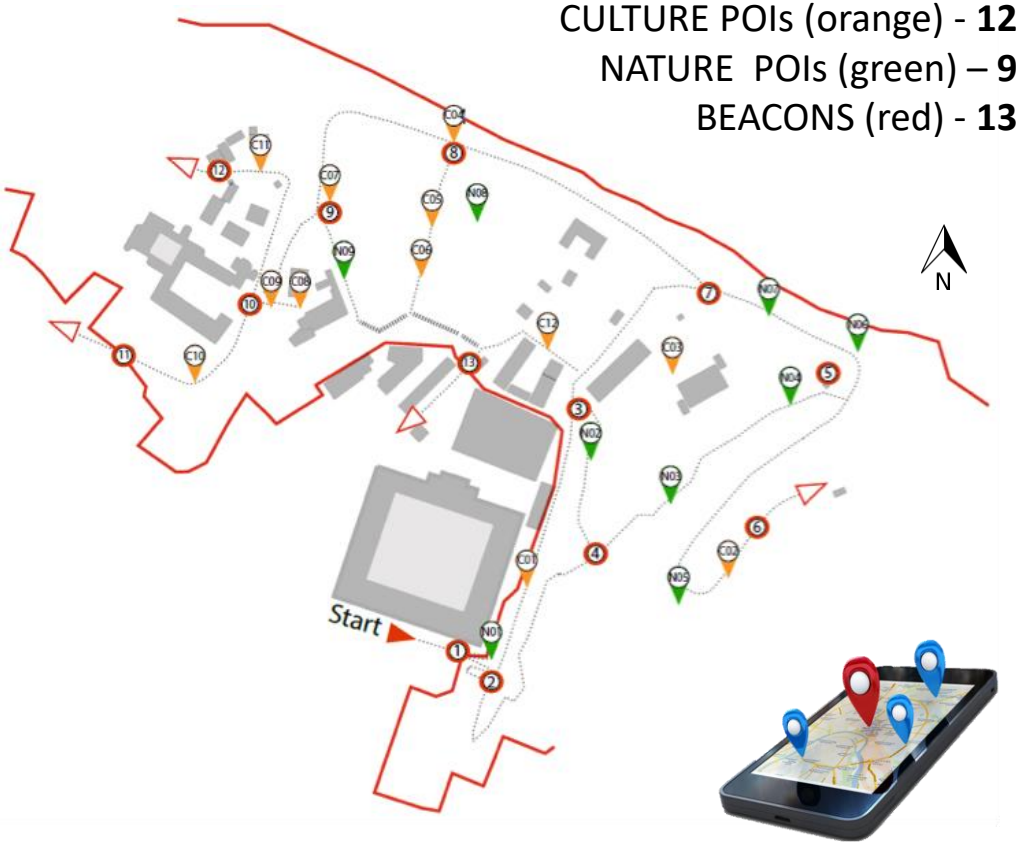
Historical contents
Dott. Giorgio Mangani,
Arch. Vittorio Salmoni

Botanical contents
Prof. Andrea Galli,
Societa cooperativa HORT s.r.l.

Landscape arch. PhD student
Anna Khromova

Identified 34 POIs on 9 hectares:

CULTURE POIs (orange) - **12**
NATURE POIs (green) – **9**
BEACONS (red) - **13**



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Identifying POIs (Points of Interest)

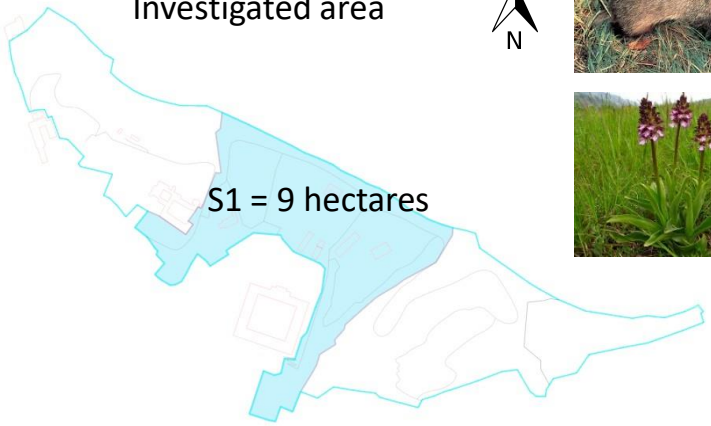
Cardeto Park area

S = 35 hectares

Investigated area

N

S1 = 9 hectares



ICT TOOLS TO IMPROVE THE ACCESSIBILITY OF THE PARK

The development of a Location Based Augmented Reality application allows:

- Enhance the way finding of the POIs
- A good solution to avoid the use the map
- Remotely stored contents

CULTURAL GOODS

ACTUAL CONDITIONS

Location based - AR

Pierdicca, R., Frontoni, E., Zingaretti, P., Malinverni, E. S., Galli, A., Marcheggiani, E., & Costa, C. S. (2016, June). Cyberarchaeology: Improved Way Findings for Archaeological Parks Through Mobile Augmented Reality. In International Conference on Augmented Reality, Virtual Reality and Computer Graphics (pp. 172-185). Springer International Publishing

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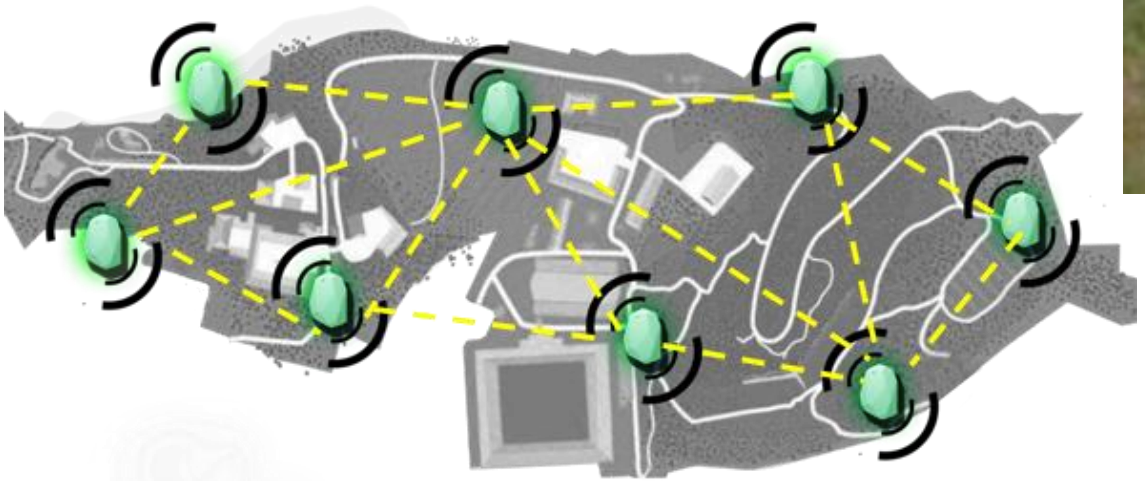
USING BLUETOOTH LOW ENERGY (BLE) TECHNOLOGY

- Providing contextual information to the visitors
- Attracting the visitors to the main POIs of the park to discover them
- Get statistics from the users
- Get the feedback from the users



Beacons installed within the park

Active beacon pairing with mobile devices

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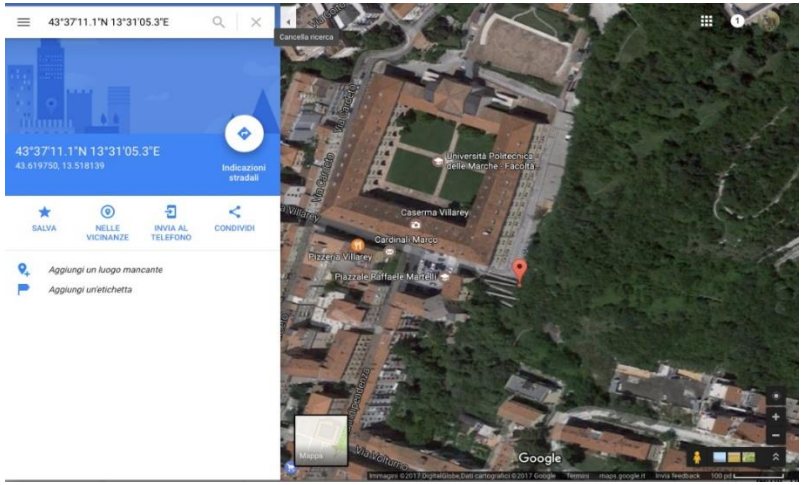

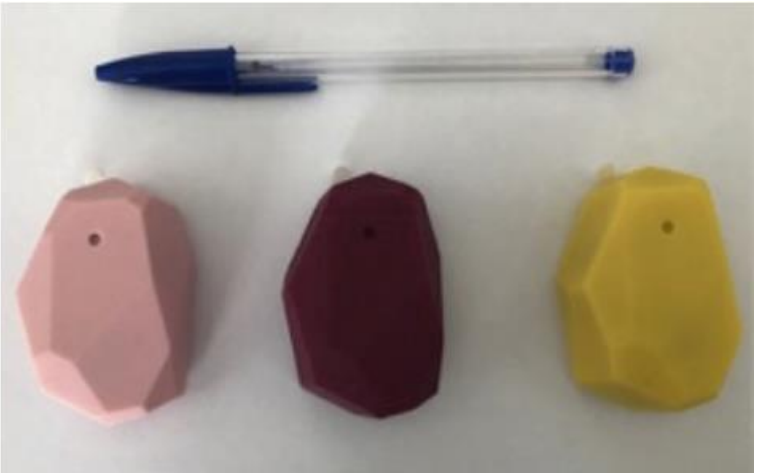

BEACONS

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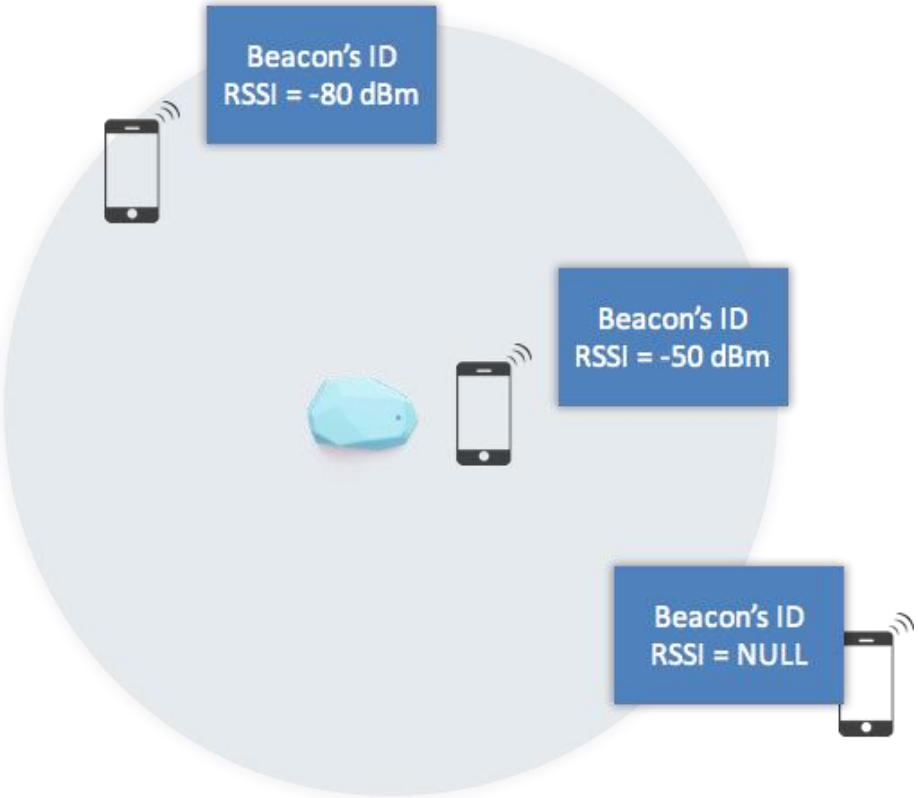
SOME INSIGHTS ABOUT THE TECHNOLOGY

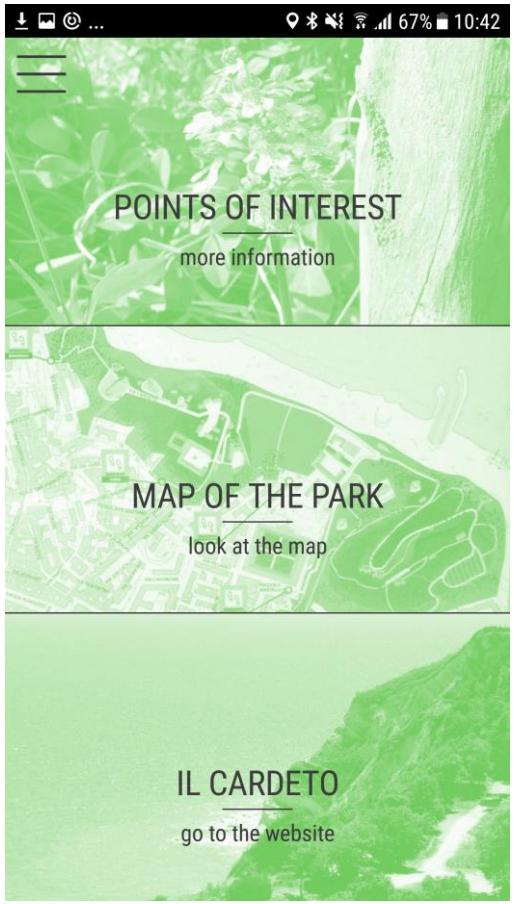


Computation of RSSI for the calculation of the distance

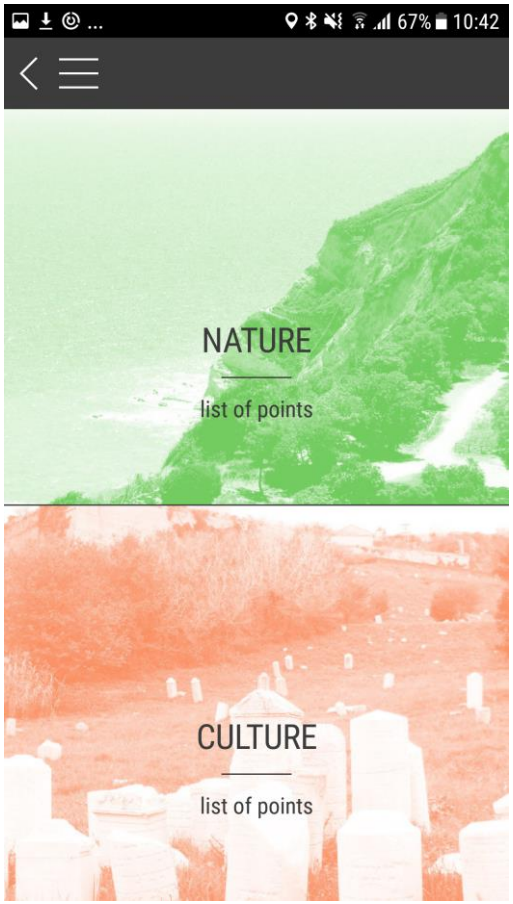
Computation of RSSI for the calculation of the distance

THE APPLICATION AT A GLANCE

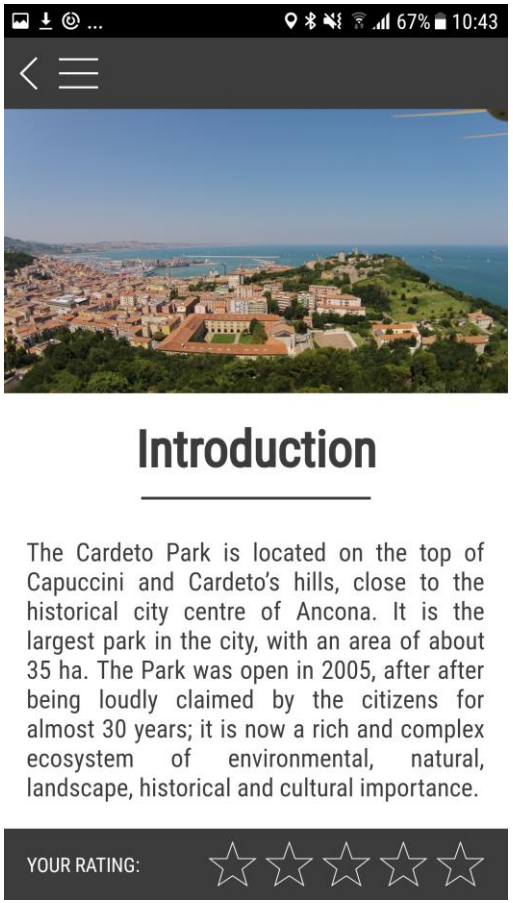
HOME



PATH POSSIBILITIES



IN DEPTH ANALYSIS



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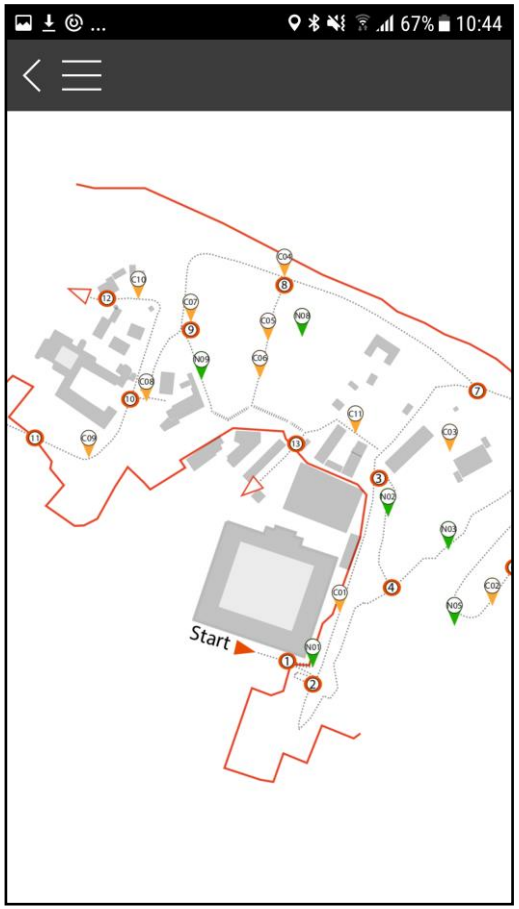
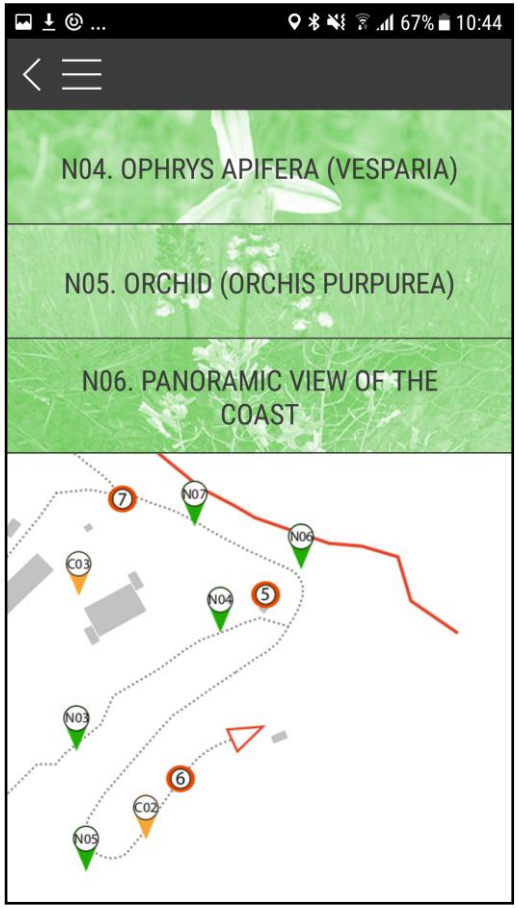
THE APPLICATION AT A GLANCE

INTERACTIVE MAP



PATH SUGGESTION



- Contextual awareness for the users
- In depth analysis of specific areas
- Personalized path
- Notification
- Users Feedback

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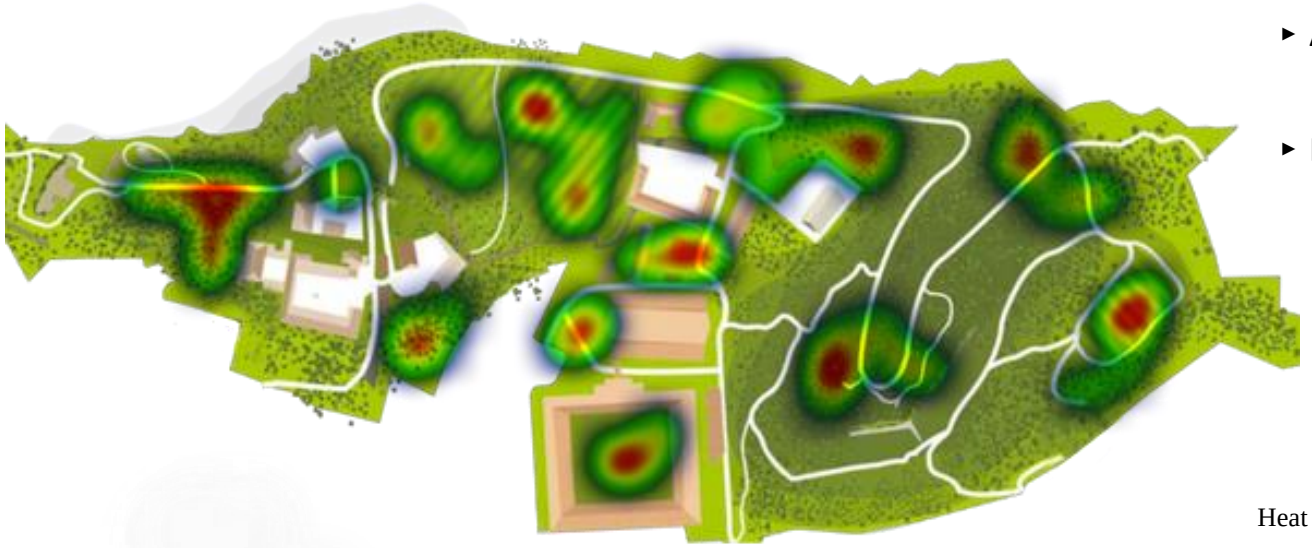
WHICH DATA ARE WE GOING TO COLLECT?

- ID: Device and Beacons
- GPS Tracking
- Time Spent
- Orientation
- Users Ration for the POIs

WHICH STATISTICS WE PLAN TO INFER?

- Most visited areas
- Visitors flows
- Visitors preferences
- Grouping interaction
- Activities in the park
- Matching with other data



Heat map moke-up of the data

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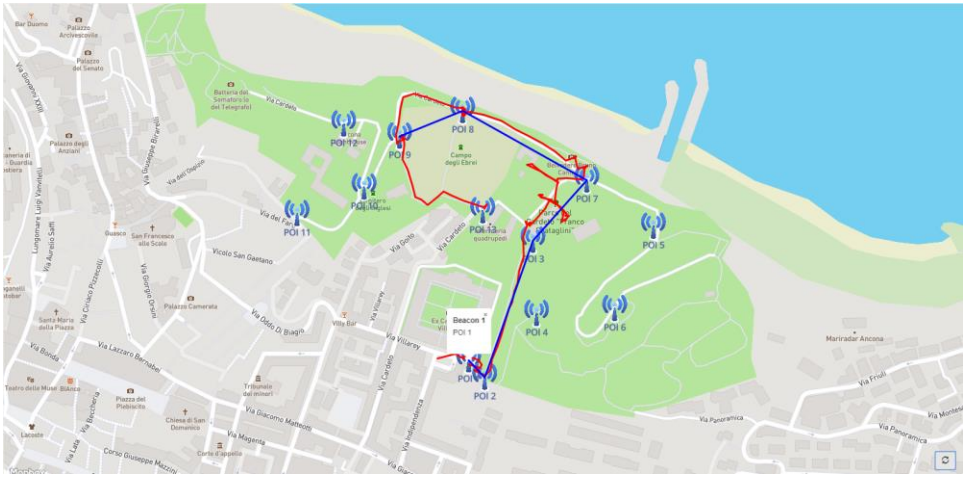
parco Cardeto Franco Scataglini

cybercardeto

User's root visualization



The purpose of the visualization tool is to create an extended application including both GPS and Bluetooth beacons data that:

- shows tracking paths (of both GPS and beacons) of various visitors and the differences between them;
- shows statistics related to a single visitor;
- shows statistics related to a single POI;
- allows to upload new datasets of multiple locations.

User's Statistics

BEACON DATA

Device ID: 035C435D-ADAA-4ABD-8190-727238CE7DDB

Beacon	Visit Time	Number of Vis
#1: POI 1	00:11:43.0	1
#2: POI 2	00:02:25.0	1
#3: POI 3	00:01:05.0	1
#4: POI 4	00:00:00.0	0
#5: POI 5	00:00:00.0	0
#6: POI 6	00:00:00.0	0
#7: POI 7	00:02:45.0	1
#8: POI 8	00:13:03.0	1
#9: POI 9	00:05:23.0	1
#10: POI 10	00:00:00.0	0
#11: POI 11	00:00:00.0	0
#12: POI 12	00:00:00.0	0
#13: POI 13	00:00:00.0	0

GPS DATA

Device ID: 035C435D-ADAA-4ABD-8190-727238CE7DDB

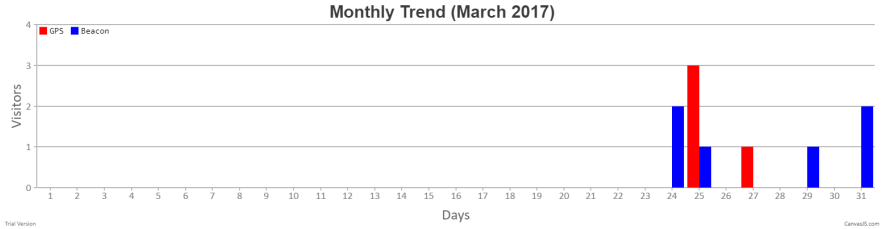
Beacon	Visit Time	Number of Visits
#1: POI 1	00:12:01.0	2
#2: POI 2	00:00:42.0	2
#3: POI 3	00:00:00.0	1
#4: POI 4	00:00:00.0	0
#5: POI 5	00:00:00.0	0
#6: POI 6	00:00:00.0	0
#7: POI 7	00:00:44.0	1
#8: POI 8	00:12:50.0	1
#9: POI 9	00:05:16.0	1
#10: POI 10	00:00:00.0	0
#11: POI 11	00:00:00.0	0
#12: POI 12	00:00:00.0	0
#13: POI 13	00:01:04.0	1

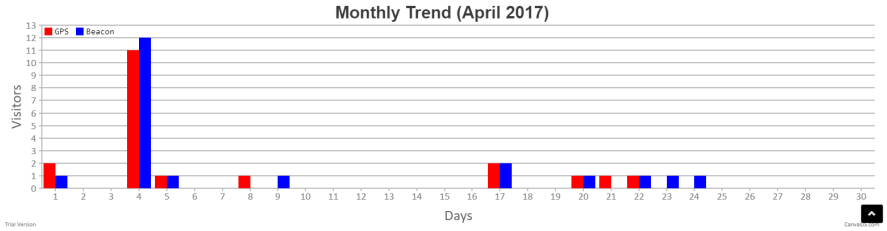
Beacon's Statistics

Close

Beacon 7 POI 7

2017





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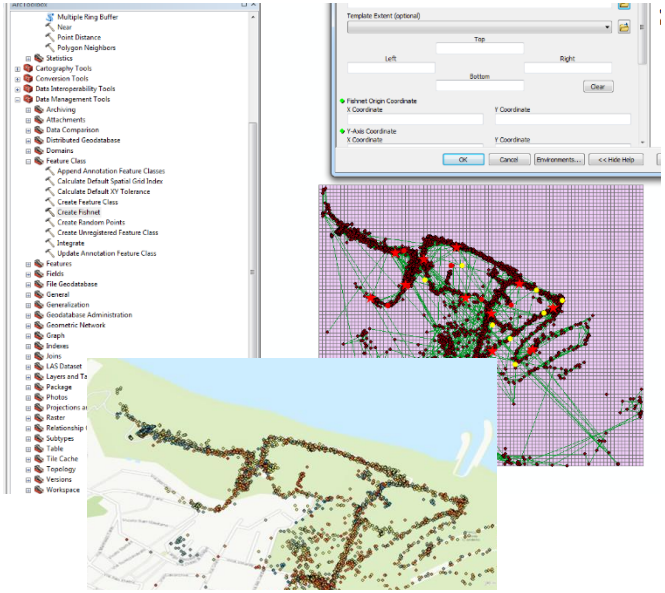
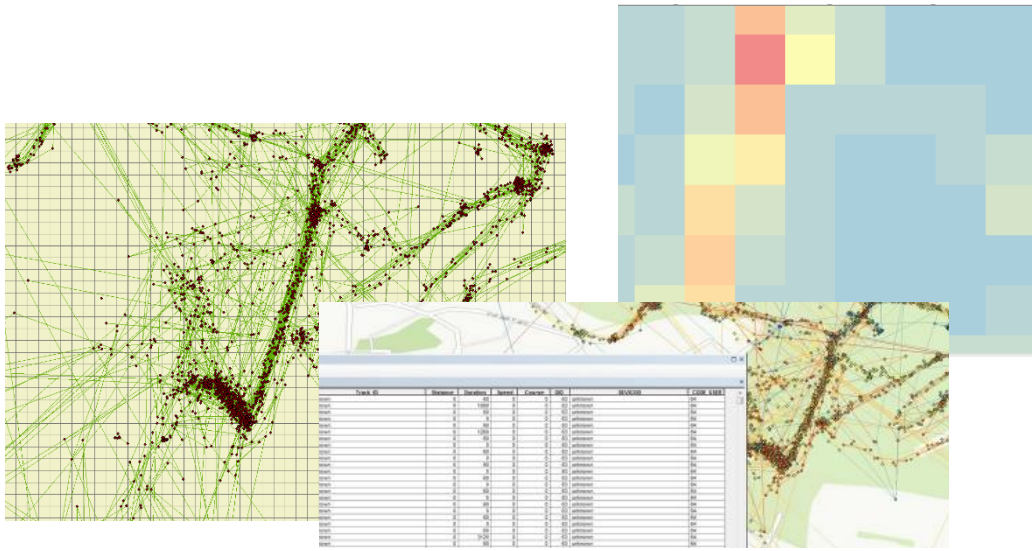
CLUSTERING USERS ACCORDING TO THEIR BEHAVIOR

SPATIAL DATA VISUALIZATION BY GIS





ADVANTAGES FOR THE PLANNER

- Improve the tourism sector
- Economic Advantage
- Improve the quality of services and planning, according to users feedback and analysis
- Activities in the park
- Matching with other data

ADVANTAGES FOR THE PARK

- The park could be more visited, hence more safe
- The idea is to make it more connected to the city, becoming a whole with the city system

ADVANTAGES FOR THE USERS

- Better knowledge about the place
- Get feedback from other users
- Co-operation among users and municipality

cost
TU 1306 EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

cyberparks

thanks for your attention!