



9° Convegno Nazionale del Gruppo di Geologia Informatica Sezione della Società Geologica Italiana

*Montefalco (PG), 16-18 giugno 2014
Complesso Museale di San Francesco*



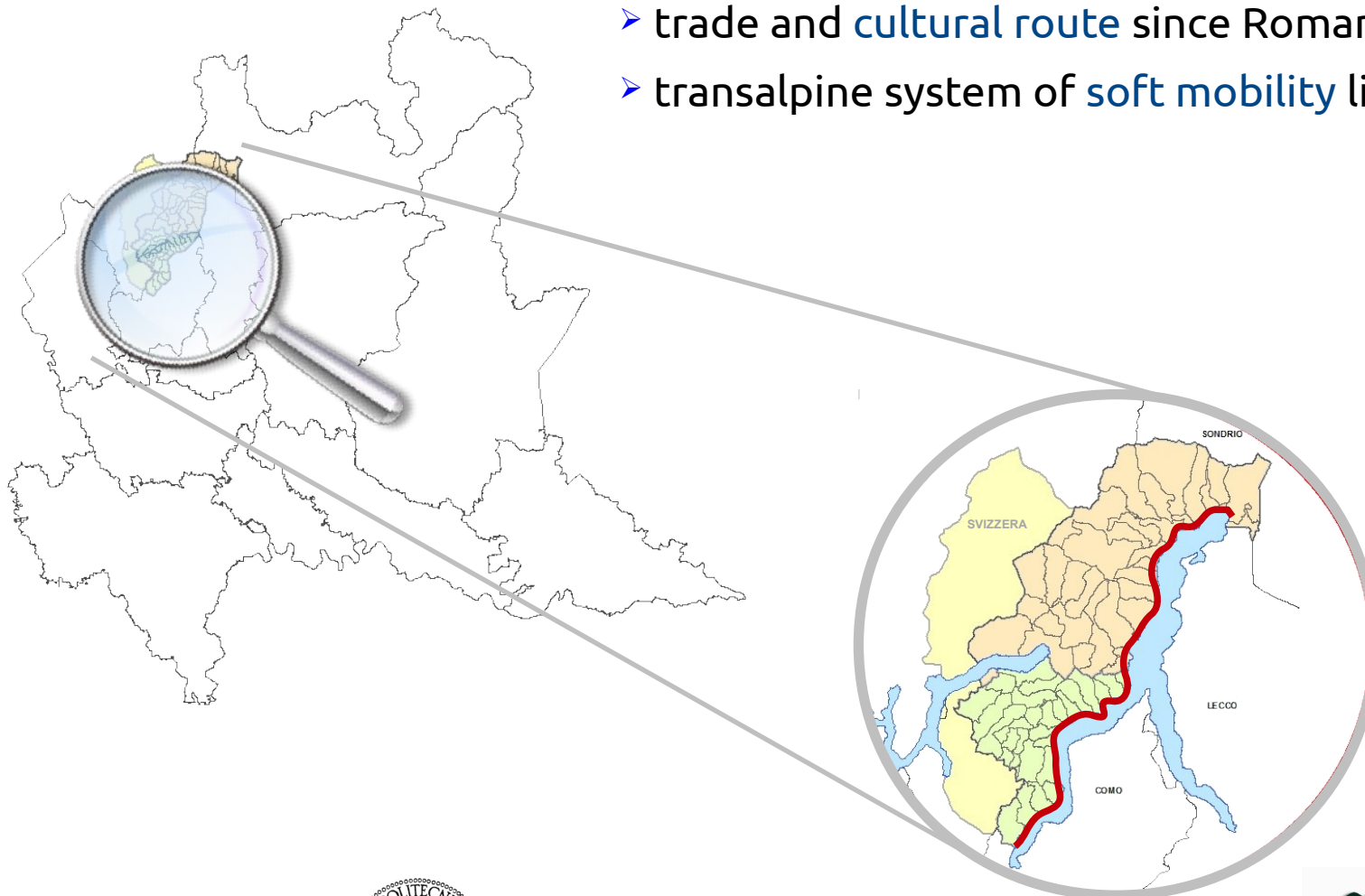
Web publication and sharing of historical and cultural knowledge: the Via Regina project

Maria Antonia Brovelli, Alba Lucchese, Marco Minghini, Marco Negretti, Giorgio Zamboni

Politecnico di Milano, Dipartimento di ingegneria Civile e Ambientale (DICA) –
Laboratorio di Geomatica, Polo Territoriale di Como

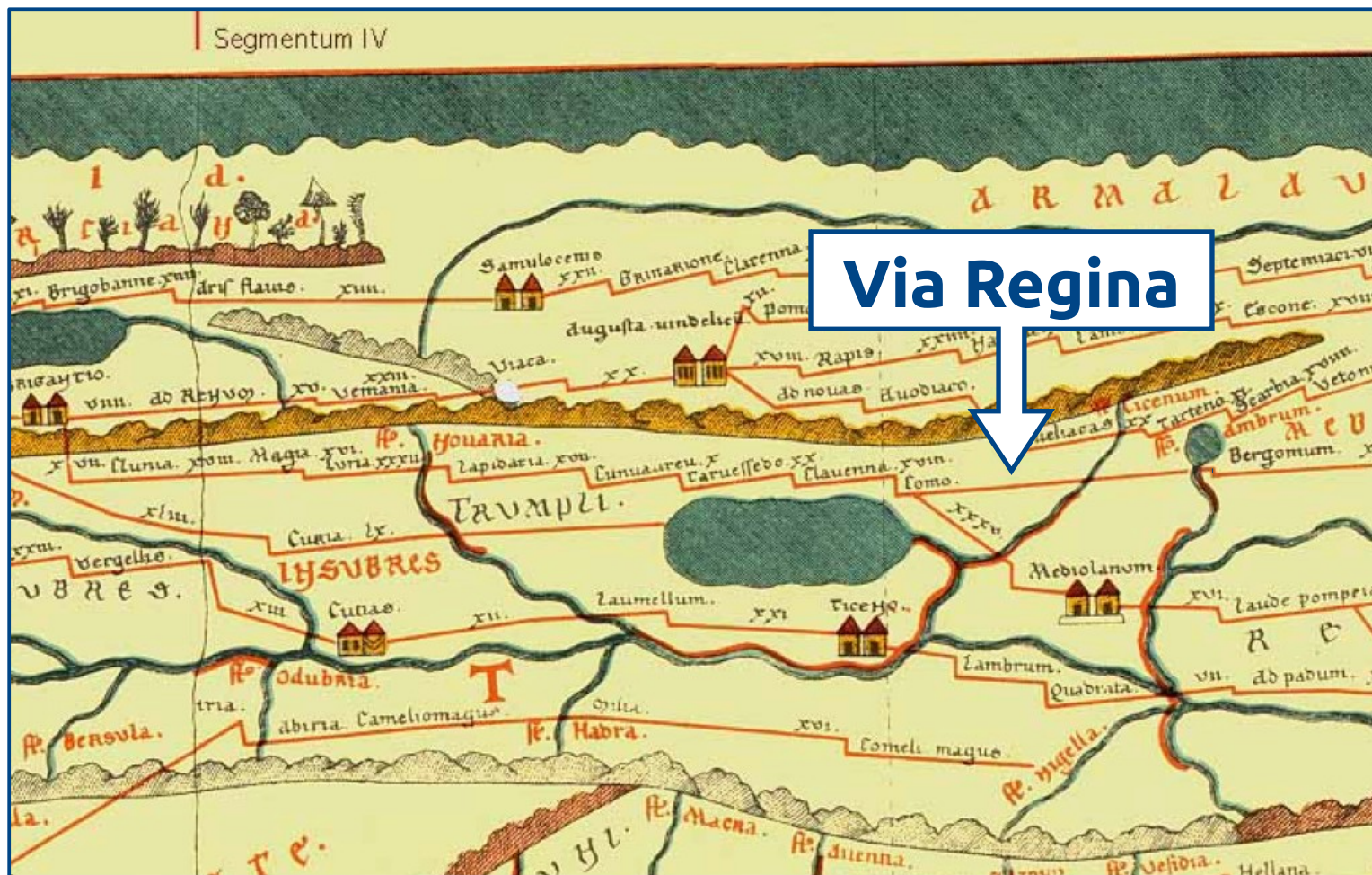
Via Regina

- ❖ Via Regina defines a **cross-border area** between Italy and Switzerland
 - trade and **cultural route** since Roman times
 - transalpine system of **soft mobility** links



Via Regina

- ❖ Via Regina defines a **cross-border area** between Italy and Switzerland



Via Regina project



- ❖ “I Cammini della Regina” INTERREG project (Italy/Switzerland)
 - **purpose:** to valorise the cultural heritage of the area and foster slow tourism
 - **beneficiaries:** local communities, administrations, pilgrims, tourists
 - **expertise involved:** cultural heritage, land use and design, geomatics

❖ Partners

- universities

POLITECNICO DI MILANO



POLO TERRITORIALE
DI COMO



Scuola universitaria professionale
della Svizzera italiana

SUPSI

- local administrations



M.M. V.I.S.
Museo della Via Spluga
e della Val San Giacomo



- cultural association

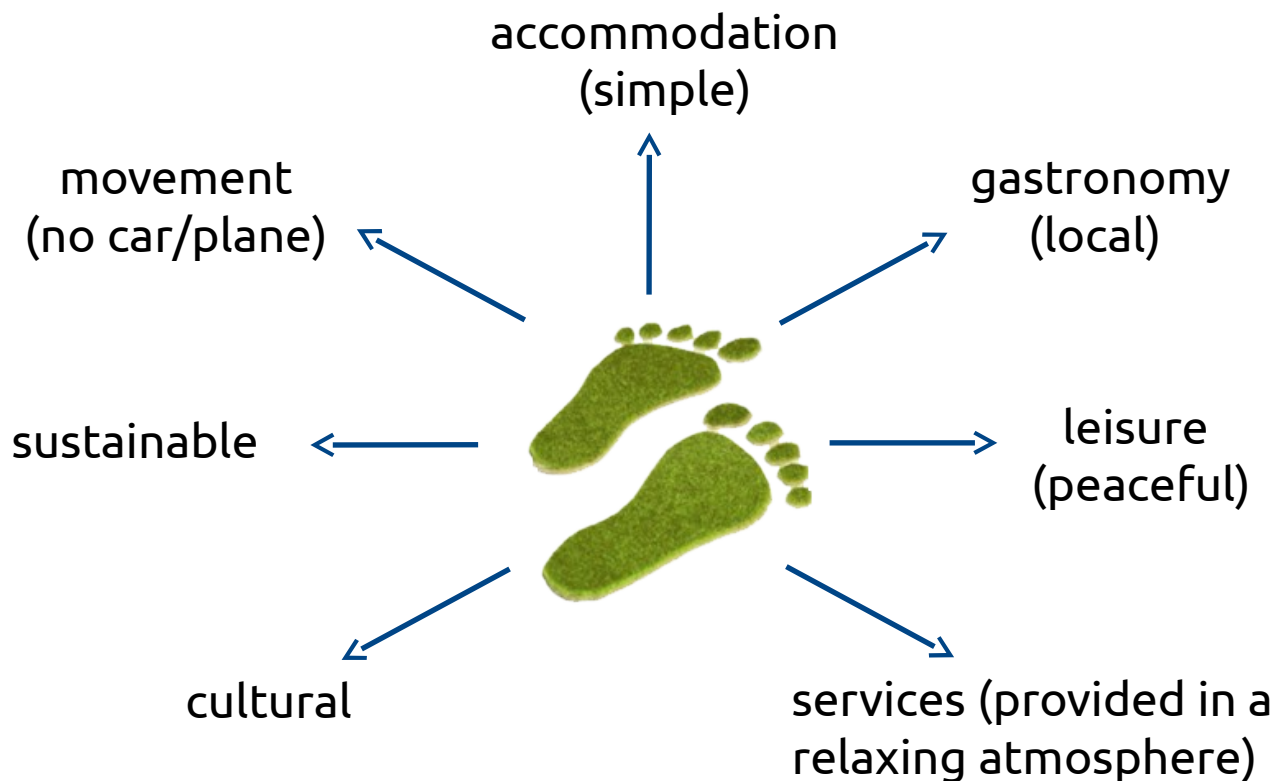


IUBILANTES
ONLUS - organizzazione
di volontariato culturale

Slow tourism at a glance



- ❖ A special case of sustainable tourism focused on:
 - environmental friendliness
 - rediscovery of local traditions and cultural knowledge



Web Mapping within the project



- ❖ Crucial for **disseminating knowledge** and **increasing tourism**
- ❖ Responsible partners:
 - Politecnico di Milano – Polo Territoriale di Como (project leader)
 - Scuola Universitaria Professionale della Svizzera Italiana (SUPSI)
- ❖ Planned activities & deliverables:
 - implementation of standard **geoWeb services** for data dissemination
 - creation of a Web platform for remote **data upload and sharing**
 - development of an application for data input from **mobile devices**
 - implementation of **multi-dimensional viewers** (2D & 3D)
 - design of an **Augmented Reality** application

Web Mapping within the project

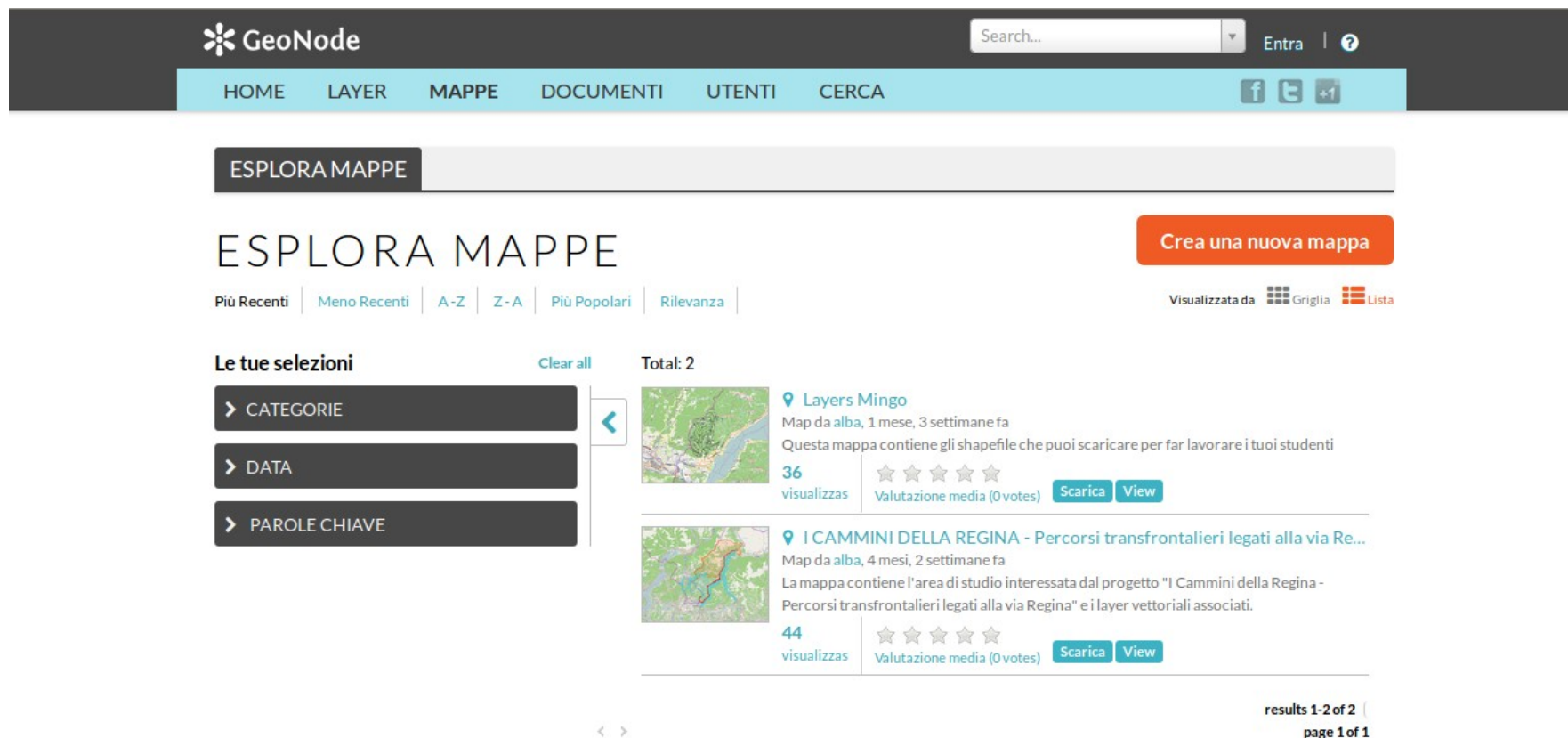
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 - design of an **Augmented Reality** application
- ❖ Exploitation of Free and Open Source Software (**FOSS**)

Data upload & sharing



❖ Based on the geospatial Web **collaborative** platform  **GeoNode**


➤ creation, styling, sharing, visualization, and collaborative use of geospatial data

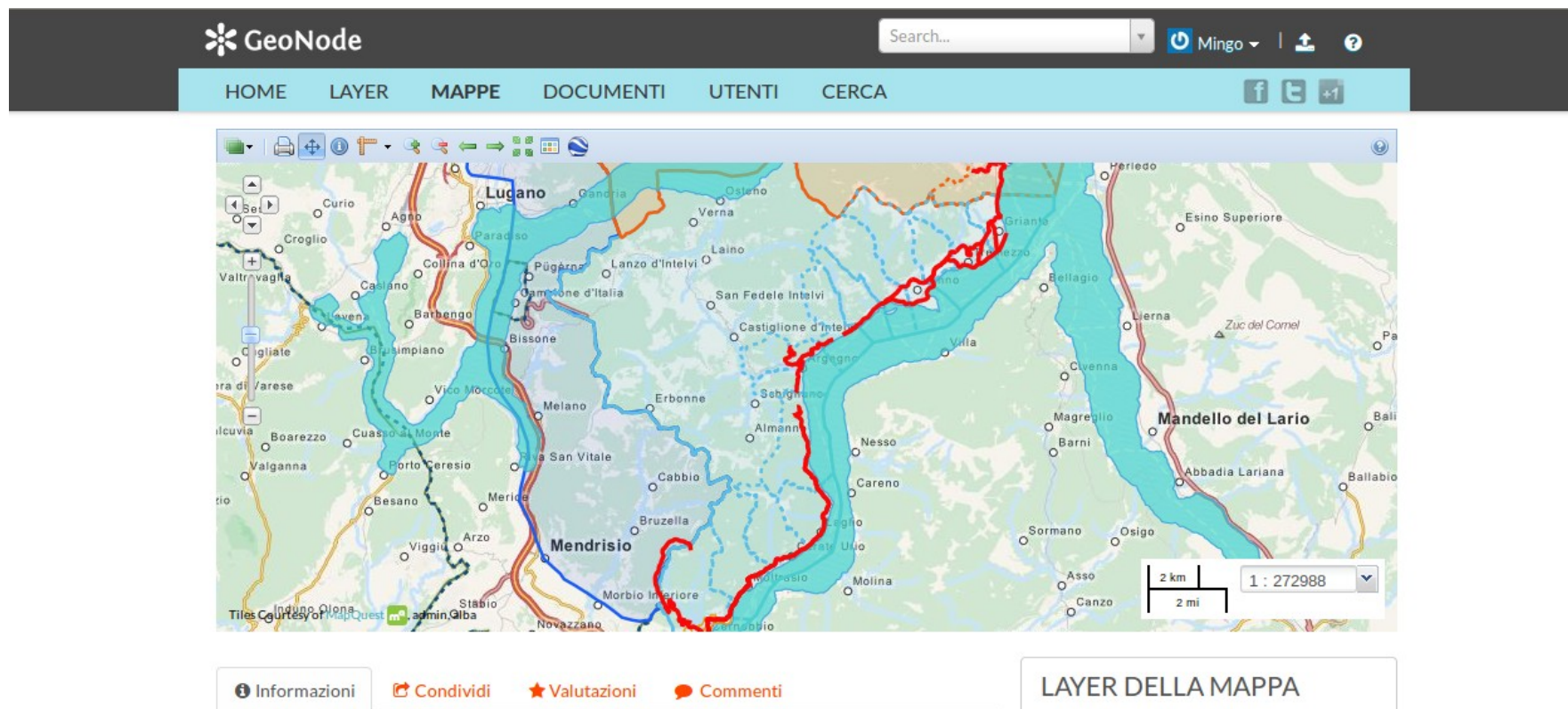


The screenshot shows the GeoNode web interface. At the top, there's a navigation bar with the GeoNode logo, a search bar, and links for HOME, LAYER, MAPPE, DOCUMENTI, UTENTI, and CERCA. Below this is a section titled "ESPLORA MAPPE" with a "Crea una nuova mappa" button. The main content area displays a list of maps. The first map is "Layers Mingo" by alba, created 1 month and 3 weeks ago, with 36 visualizations and a 5-star rating. The second map is "I CAMMINI DELLA REGINA - Percorsi transfrontalieri legati alla via Re..." by alba, created 4 months and 2 weeks ago, with 44 visualizations and a 5-star rating. The interface includes filters for "Le tue selezioni" (CATEGORIE, DATA, PAROLE CHIAVE) and a "Clear all" button. The bottom right corner shows "results 1-2 of 2" and "page 1 of 1".

<http://viaregina.como.polimi.it>

Data upload & sharing

- ❖ Based on the geospatial Web collaborative platform  GeoNode
 - creation, styling, sharing, visualization, and collaborative use of geospatial data



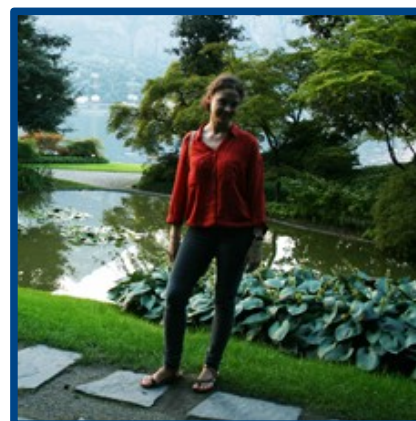
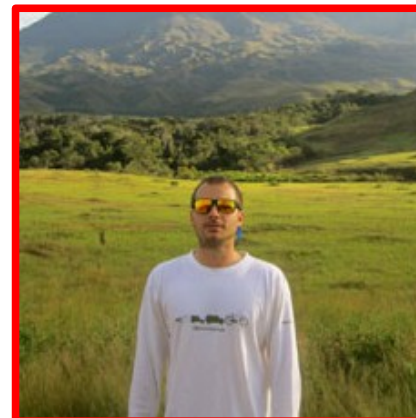
<http://viaregina.como.polimi.it>

- ❖ MSc course (5 ECTS) carried out at Politecnico di Milano, Como Campus
- ❖ Opened to the **brightest students** (selection is done) from Environmental, Management and Science Computing Engineering
- ❖ **Mixed groups** working on **business cases** proposed by **real companies**
- ❖ Group supervision relies on:
 - a reference tutor from university (**junior researcher**)
 - a **company representative**
 - the **board of Professors** (one for each MSc School)
- ❖ Organized into weekly **meetings, seminars** and **teaching alignments**
- ❖ Students' **final evaluation** is based on:
 - materials delivered during the course (project plan, intermediate and final project presentation, project report)
 - tutors' and Professors' evaluations
 - students' self-evaluations (every 4 weeks)



❖ Team composition:

- Arman Shirani
- Gabriel Perez Russo
- Raphaël Nataf
- Daniele Oxoli
- Candan Eylül Kilsedar
- Marco Minghini

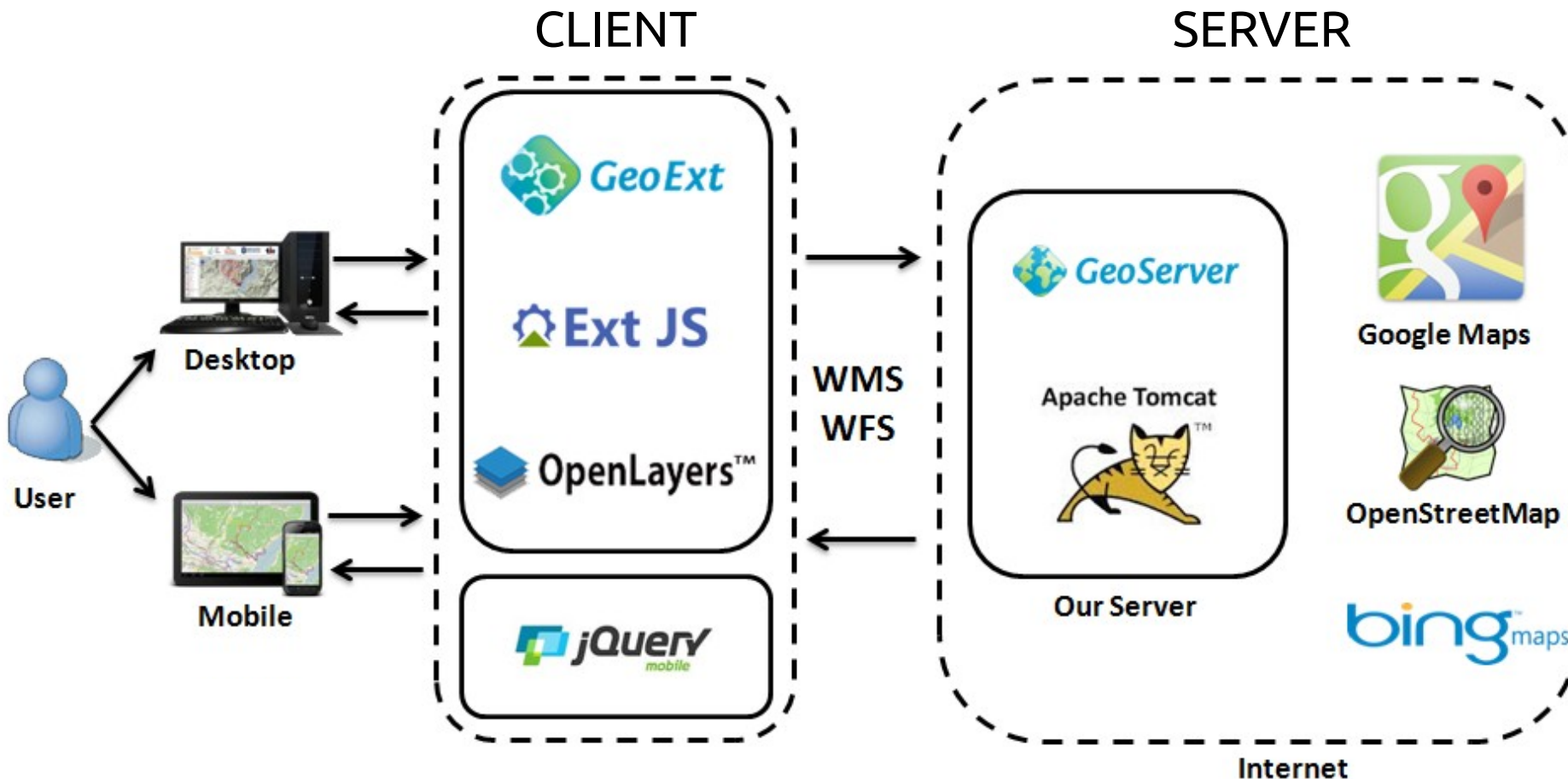


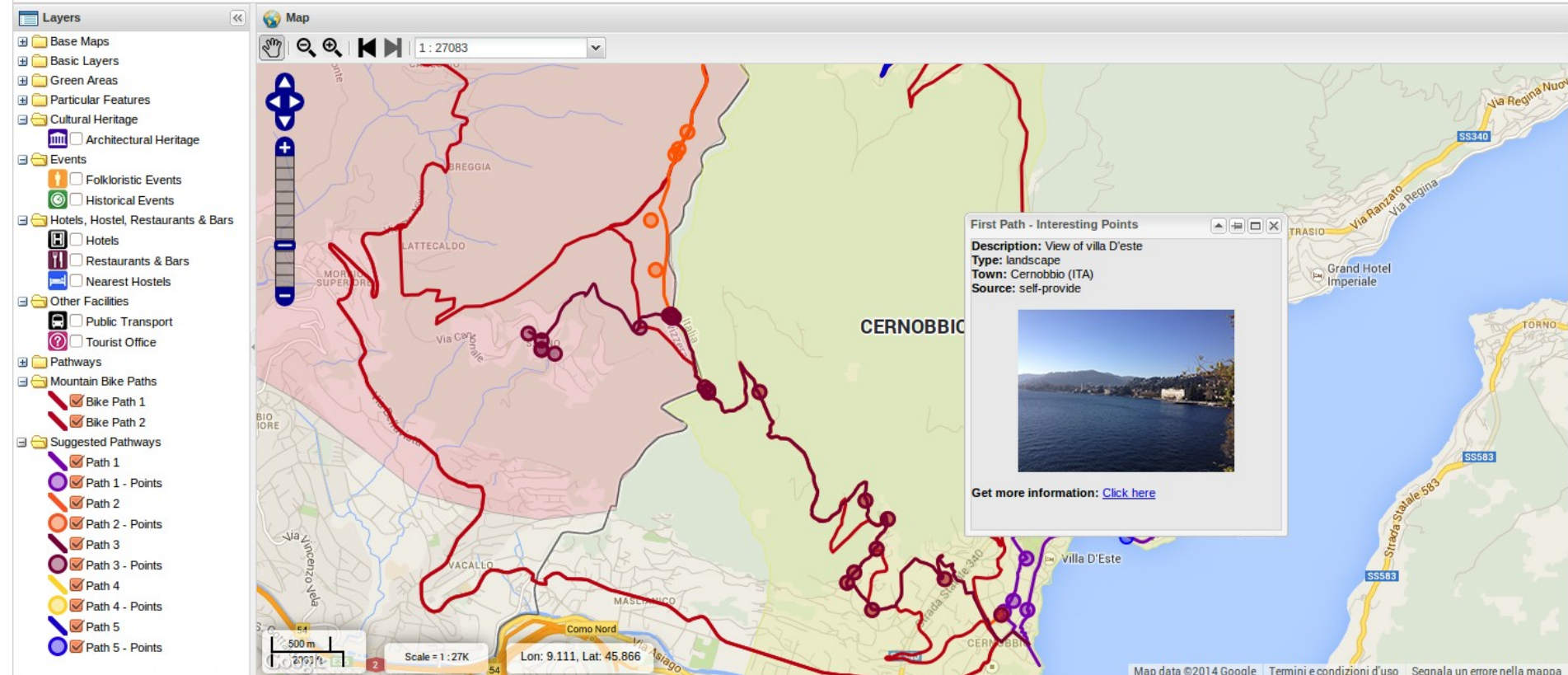
Environmental
Engineering

Science Computing
Engineering

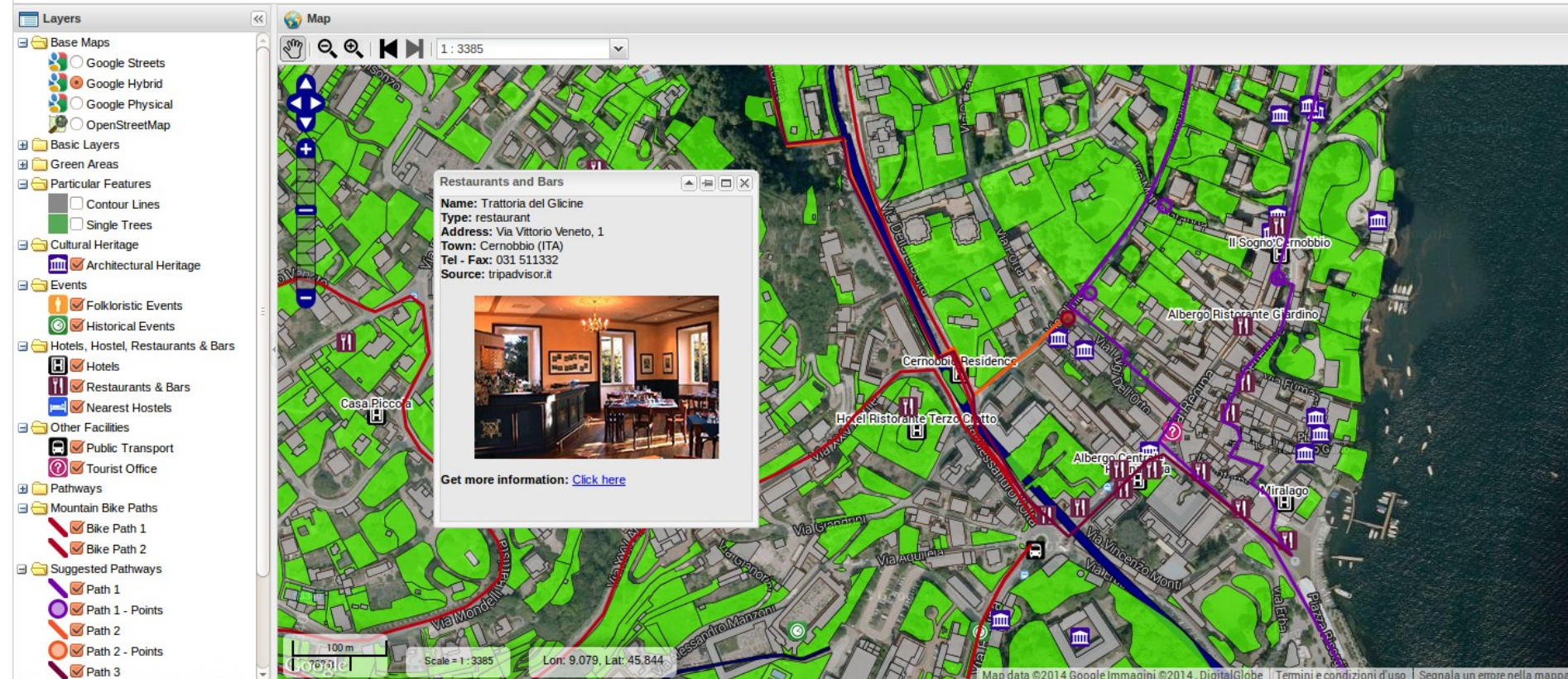
Academic tutor

WebGIS architecture

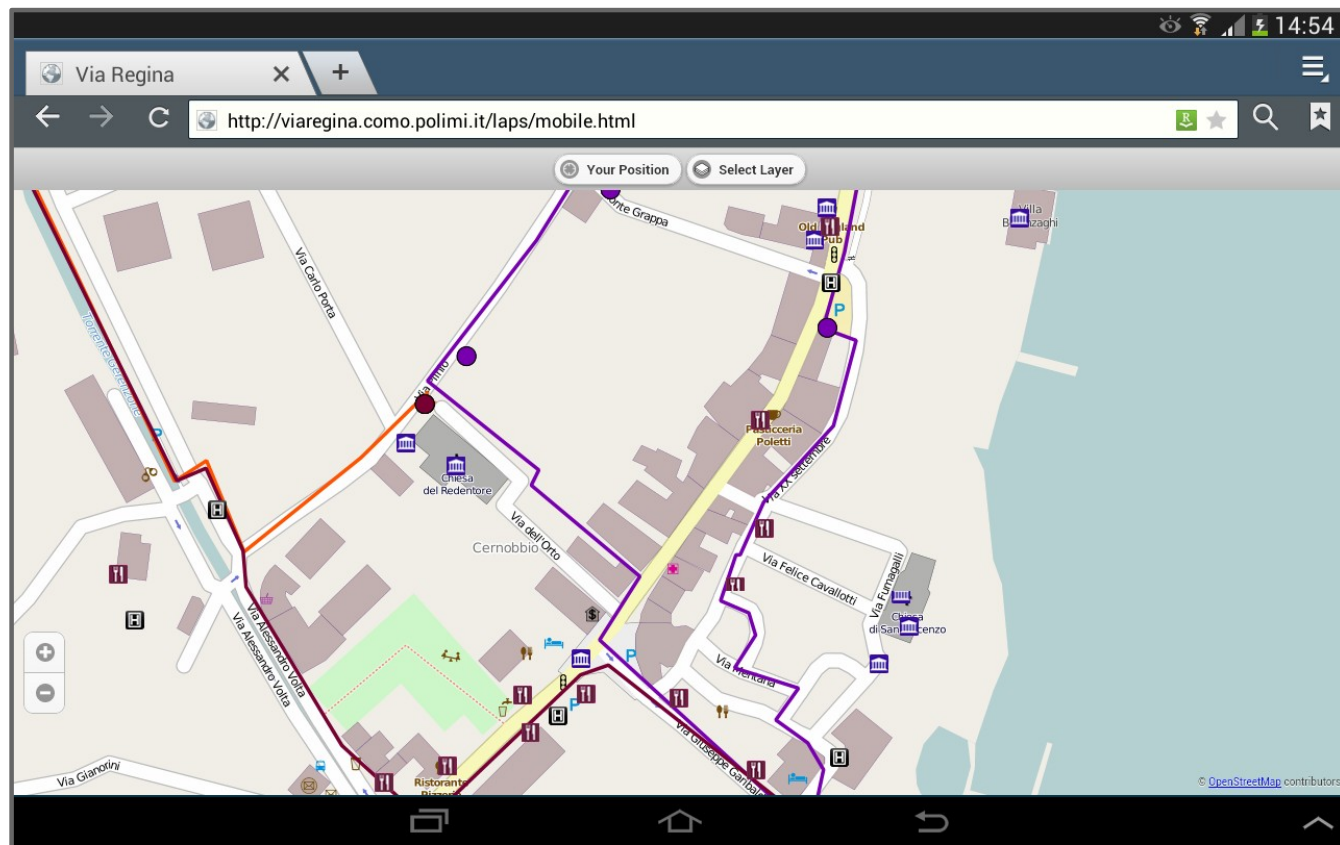
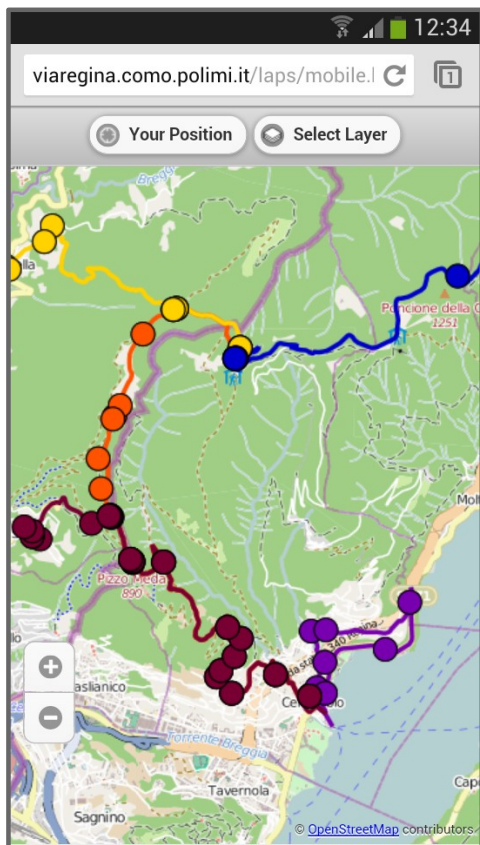




<http://viaregina.como.polimi.it/laps>

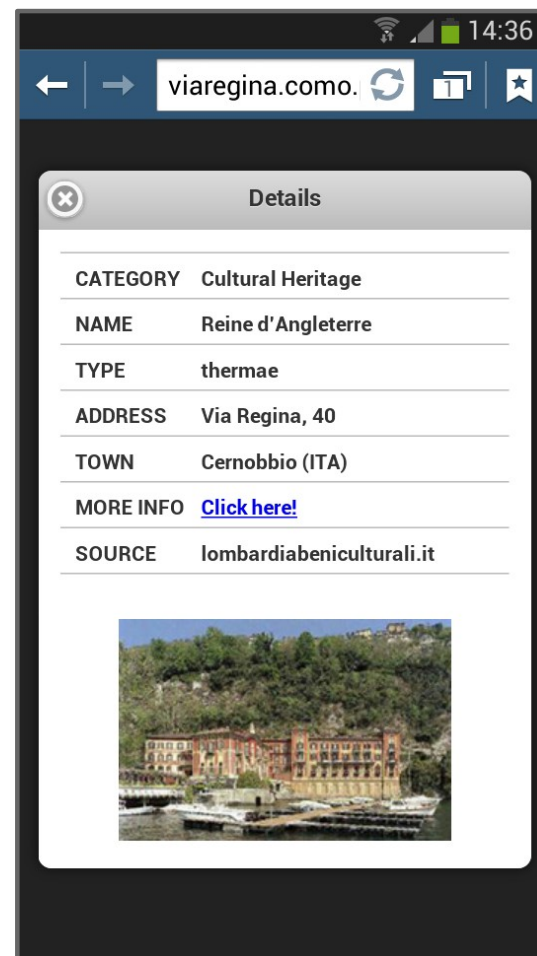
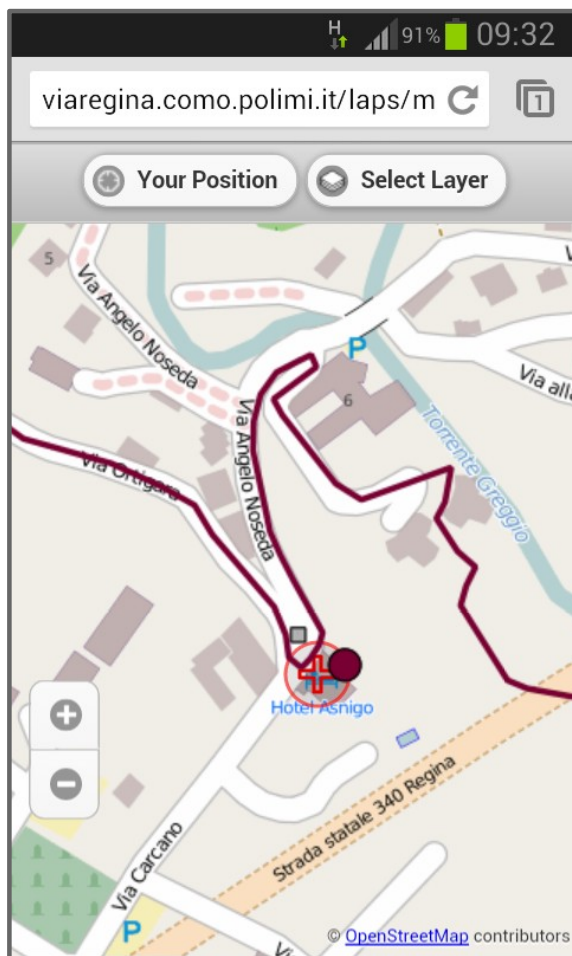


<http://viaregina.como.polimi.it/laps>



<http://viaregina.como.polimi.it/laps/mobile.html>

Mobile WebGIS



<http://viaregina.como.polimi.it/laps/mobile.html>

❖ Based on the suite of tools 

➤ management of mobile data collection through a set of related applications

FORM CREATION



Apache Tomcat

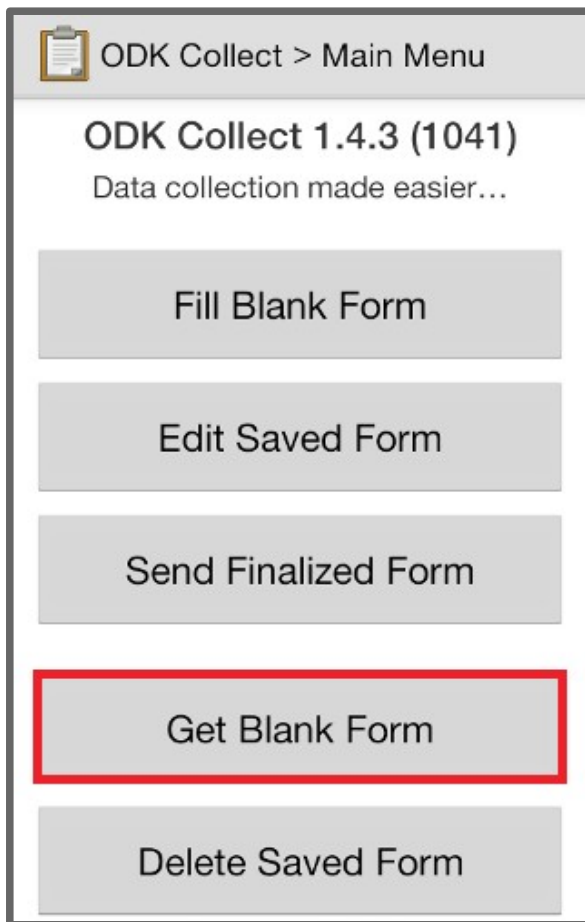


FORM STORAGE

FORM COMPILATION



❖ Form download



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)
Data collection made easier...

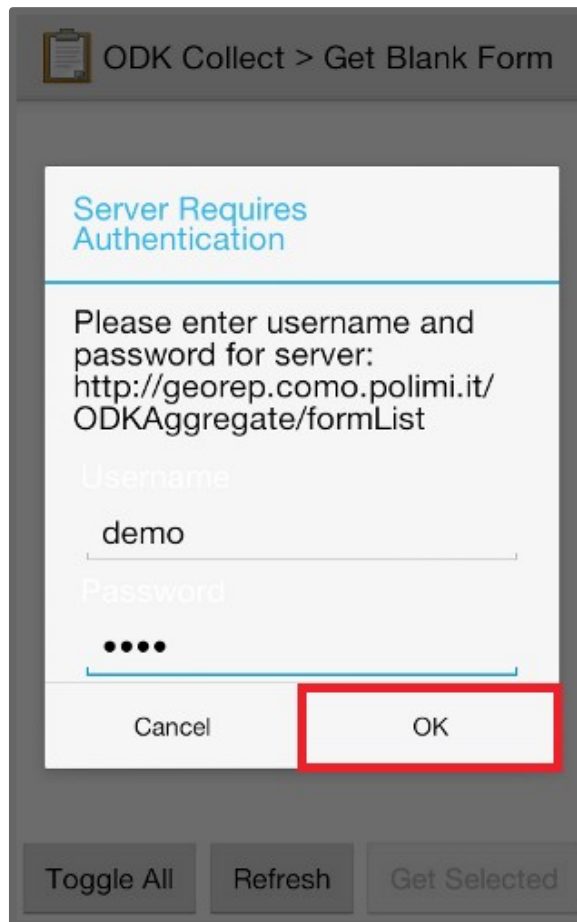
Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



ODK Collect > Get Blank Form

Server Requires Authentication

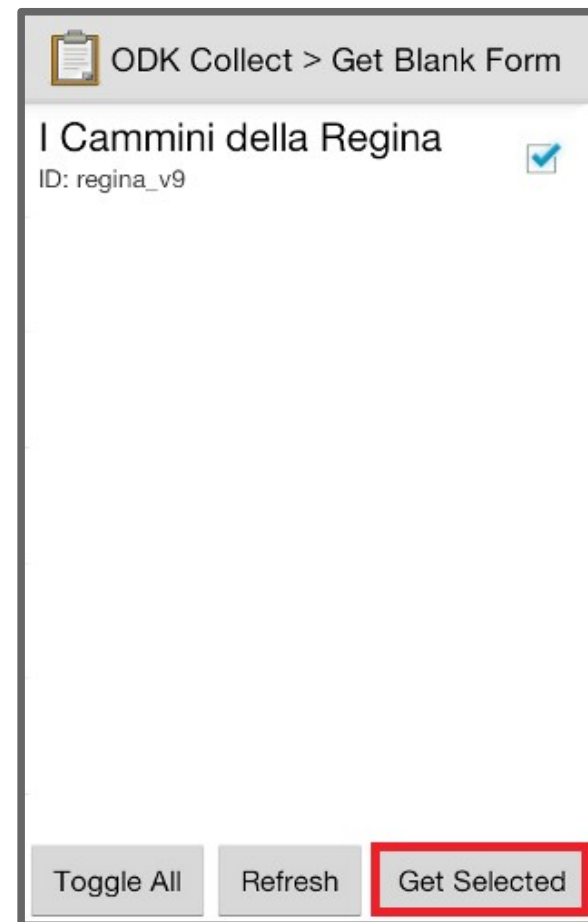
Please enter username and password for server:
<http://georep.como.polimi.it/ODKAggregate/formList>

Username
demo

Password
....

Cancel OK

Toggle All Refresh Get Selected



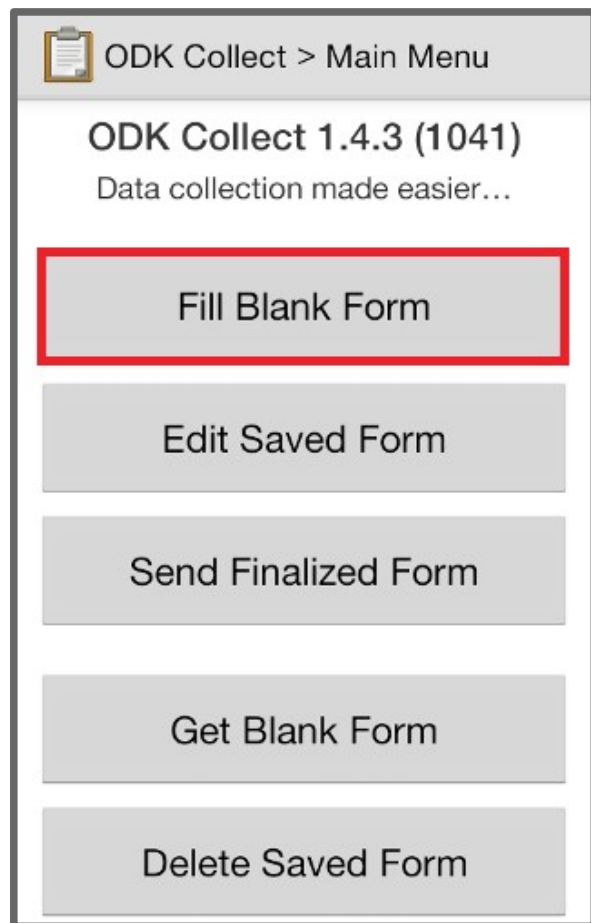
ODK Collect > Get Blank Form

I Cammini della Regina ☒

ID: regina_v9

Toggle All Refresh Get Selected

❖ Form compilation



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)
Data collection made easier...

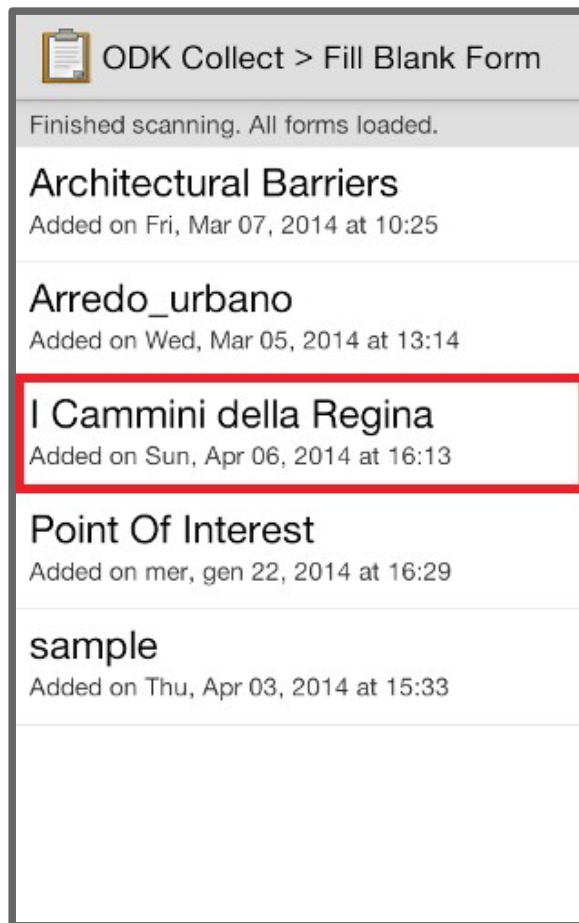
Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



ODK Collect > Fill Blank Form

Finished scanning. All forms loaded.

Architectural Barriers
Added on Fri, Mar 07, 2014 at 10:25

Arredo_urbano
Added on Wed, Mar 05, 2014 at 13:14

I Cammini della Regina
Added on Sun, Apr 06, 2014 at 16:13

Point Of Interest
Added on mer, gen 22, 2014 at 16:29

sample
Added on Thu, Apr 03, 2014 at 15:33



ODK Collect...

I CAMMINI DELLA REGINA
percorsi transfrontalieri legati alla Via Regina

You are at the start of I
Cammini della Regina. Swipe
the screen as shown below to
go backward and forward.

backward to previous prompt

forward to next prompt

❖ Form compilation

ODK Collect...

Date of report

Aprile 2014

D	L	M	M	G	V	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

ODK Collect...

Type of user:

Specify which kind of user you are by choosing one of the following options.

- ☒ tourist from Italy
- ☐ tourist from abroad
- ☐ citizen of Como province
- ☐ citizen of Ticino Canton

ODK Collect...

Type of element:

Specify which kind of element you wish to report by choosing one of the following options.


- ☒ historical and cultural element
- ☐ morphological element

❖ Form compilation


ODK Collect...

Classification of the element:
Classify the element you wish to report by choosing one of the following options.

☒ museum



☐ religious building



ODK Collect...

Subclassification of the element:
Classify the element you wish to report by choosing one of the following options (optional).

☐ ethnographyc

☒ thematic

☐ gallery

☐ collections

ODK Collect...

Name of the element:
Type the name of the element you wish to report (optional).

Museum of Villa Erba

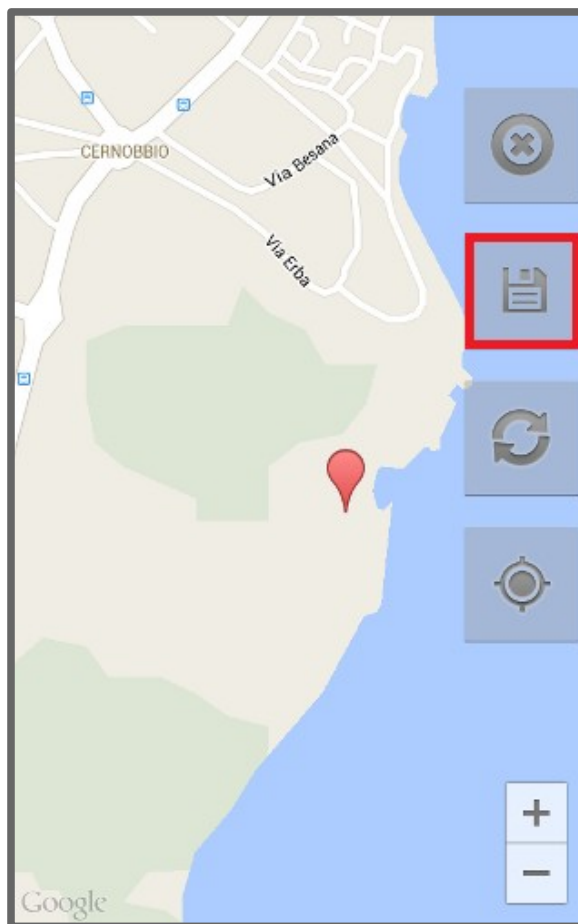
❖ Form compilation

ODK Collect...

Position of the element:
Be sure to be outdoors and check that the device GPS is on. Alternatively, you can also determine the position by connecting to a wi-fi network.

Replace Location

Latitude: N 45°50'16"
 Longitude: E 9°4'39"
 Altitude: 0m
 Accuracy: 5.5m




ODK Collect...

Picture showing the element:
Take a picture of the element using the device camera or upload a picture available on the device.

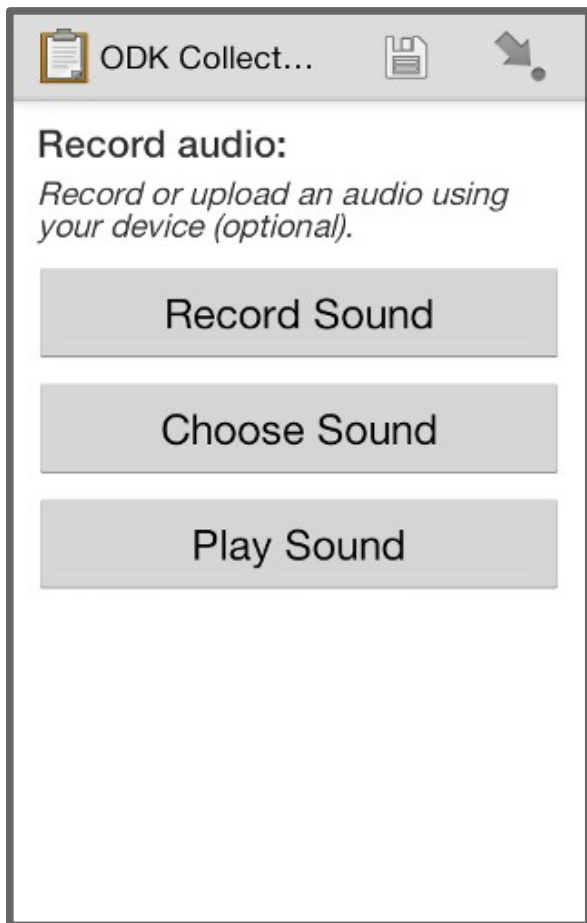
Take Picture

Choose Image



The image shows a screenshot of the ODK Collect form. It has a title 'Picture showing the element:' followed by a descriptive text. Below the text are two buttons: 'Take Picture' and 'Choose Image'. At the bottom of the form, there is a photograph of a large, ornate building with a clock tower, surrounded by greenery.

❖ Form compilation & saving



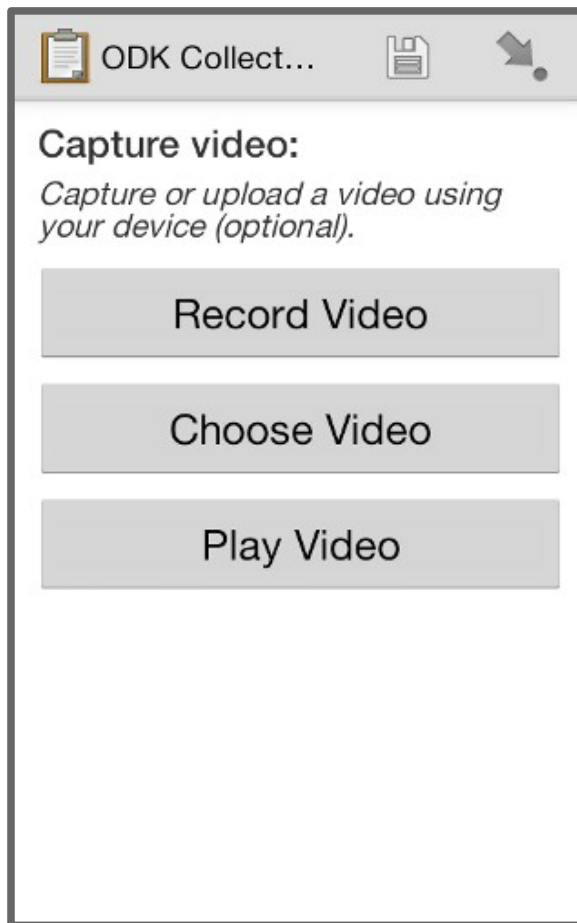
ODK Collect...

Record audio:
Record or upload an audio using your device (optional).

Record Sound

Choose Sound

Play Sound



ODK Collect...

Capture video:
Capture or upload a video using your device (optional).

Record Video

Choose Video

Play Video



ODK Collect...

You are at the end of I Cammini della Regina.

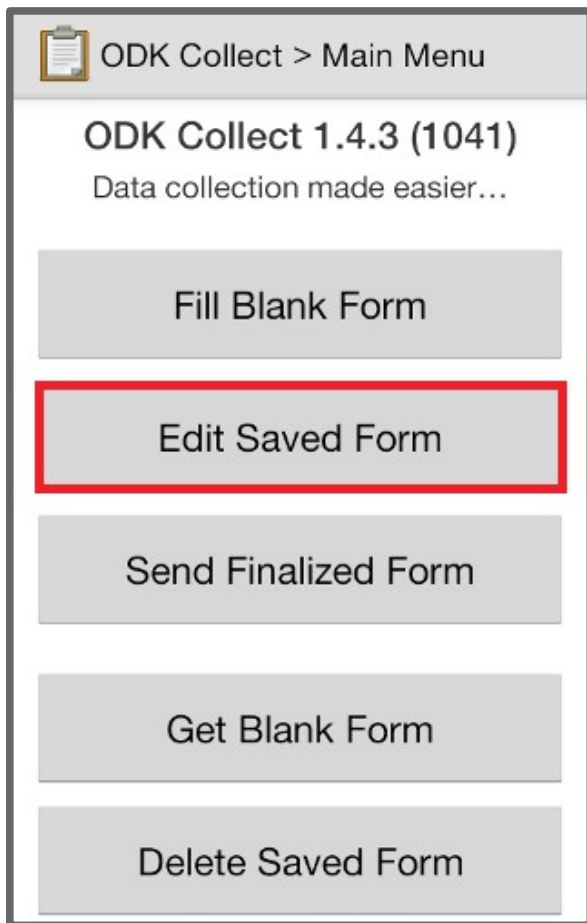
Name this form

I Cammini della Regina

☒ Mark form as finalized

Save Form and Exit

❖ Form editing & sending



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)
Data collection made easier...

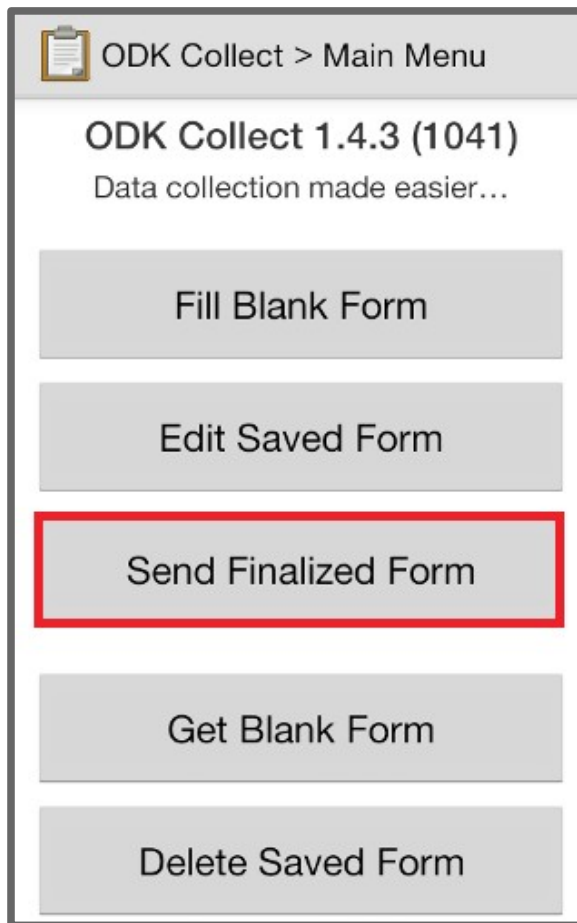
Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)
Data collection made easier...

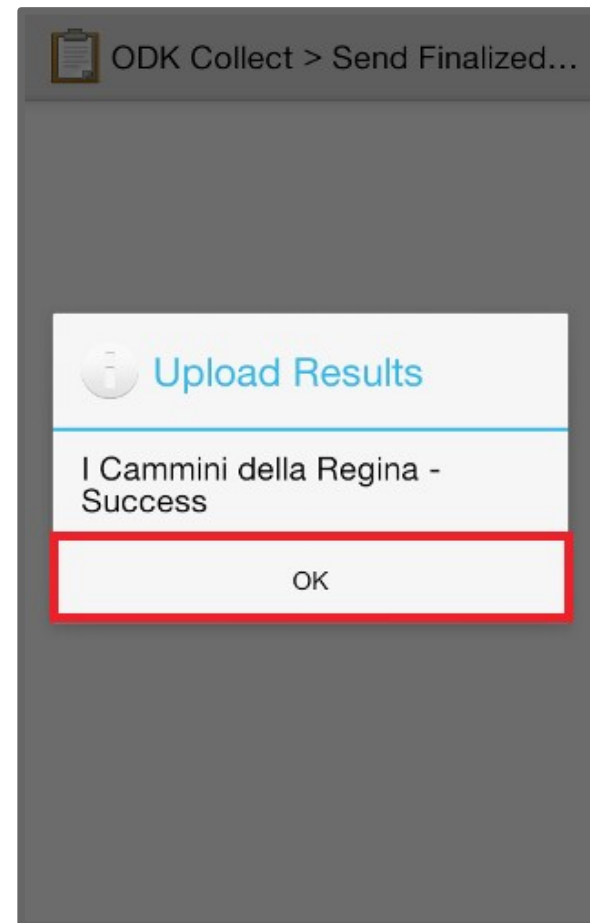
Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



ODK Collect > Send Finalized...

Upload Results

I Cammini della Regina -
Success

OK

❖ Form compilation from PC

I Cammini della Regina

Date of report of the element: *

Insert the current date or the date the report is referred to.

2014-06-10



Type of user: *

Specify which kind of user you are by choosing one of the following options.

- ☒ tourist from Italy
- ☐ tourist from abroad
- ☐ citizen of Como province
- ☐ citizen of Ticino Canton

Type of element: *

Specify which kind of element you wish to report by choosing one of the following options.

- ☒ historical and cultural element

Required



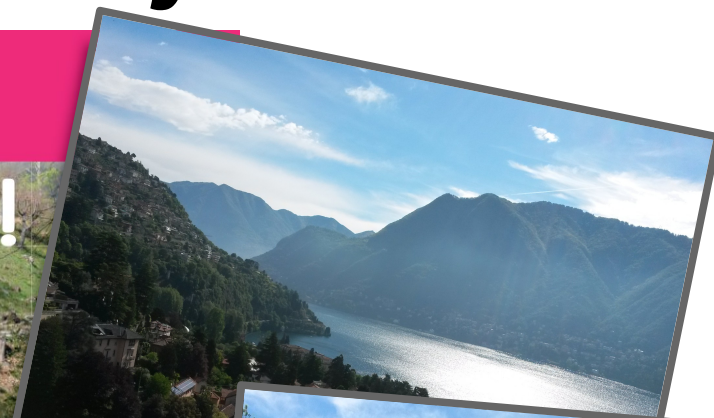
Via Regina map party

SABATO 3 MAGGIO 2014

MapParty!



CAMMINARE, OSSERVARE, DISEGNARE, MAPPARE
LUNGO I CAMMINI DELLA REGINA PER UN'ESPERIENZA
CULTURALE, SENSORIALE E GIOSA



Via Regina map party

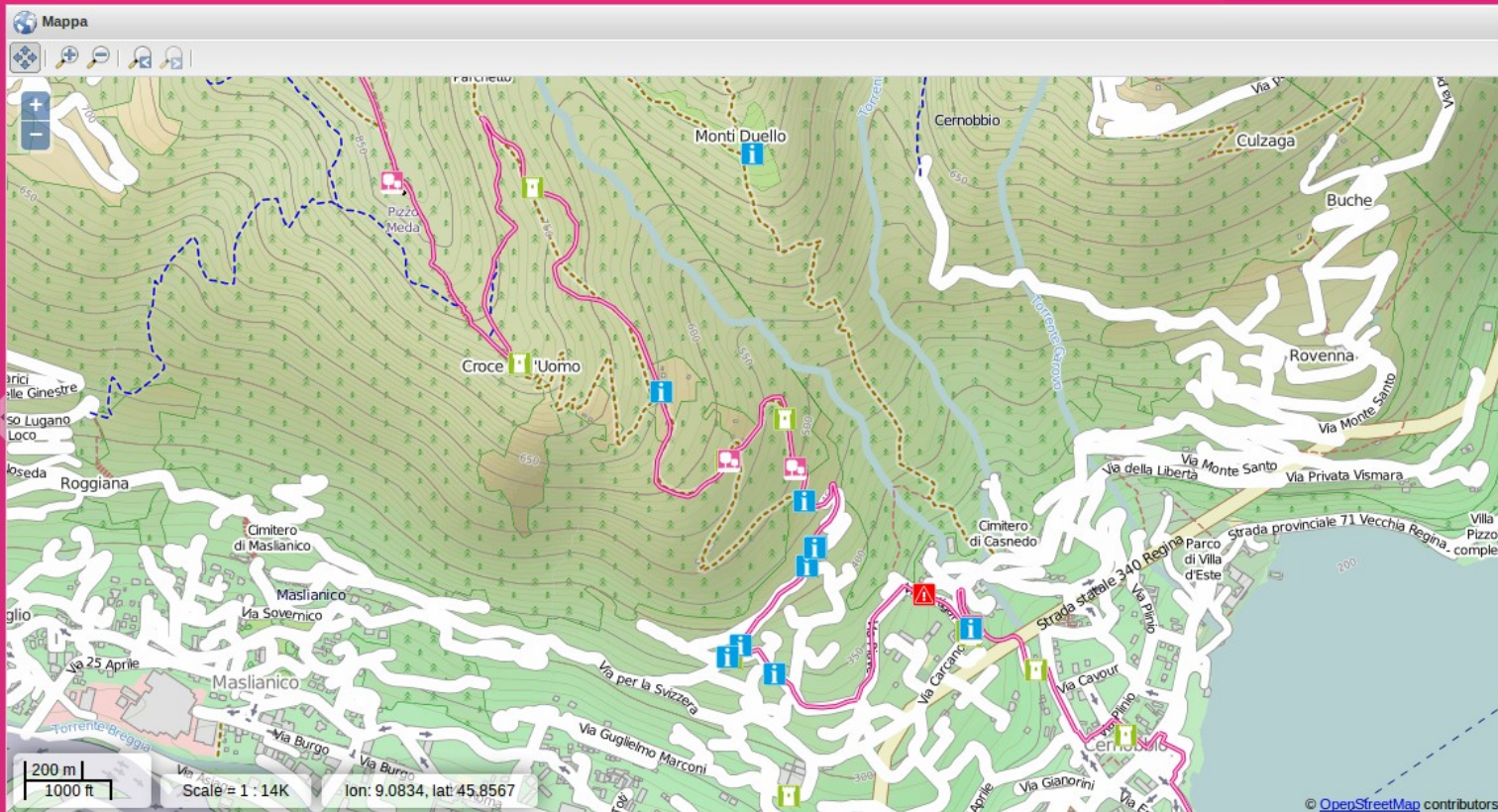


MapParty! 3 MAGGIO 2014



Legenda

- Mappe di base
- Dati amministrativi
- Elementi naturali
- Elementi antropici
 - Edifici
 - Beni architettonici
- Map Party 03/05/2014
 - Percorso
 - Punti segnalati
 - Elemento storico-culturale
 - museo
 - edilizia religiosa
 - edilizia civile
 - edilizia rurale
 - elemento di interesse archeologico
 - edilizia militare
 - opificio
 - Elemento morfologico
 - superficie
 - delimitazione/scarpata
 - supporto del traffico e manufatto
 - Elemento turistico
 - alloggio e pernottamento
 - servizi
 - trasporti
 - prodotti
 - ristorazione
 - Elemento critico
 - morfologico
 - strutturale
 - Segnalazione

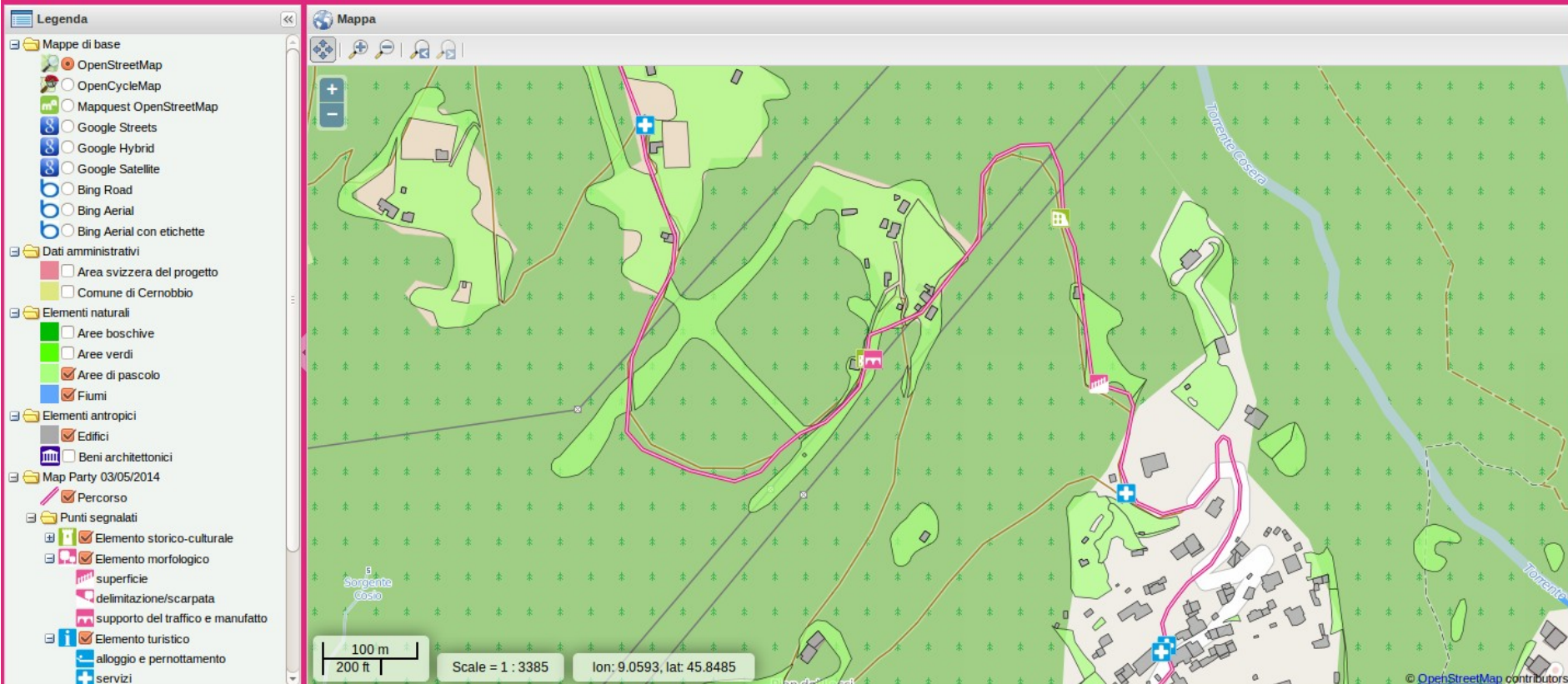


<http://viaregina.como.polimi.it/mapparty>

Via Regina map party



MapParty! 3 MAGGIO 2014

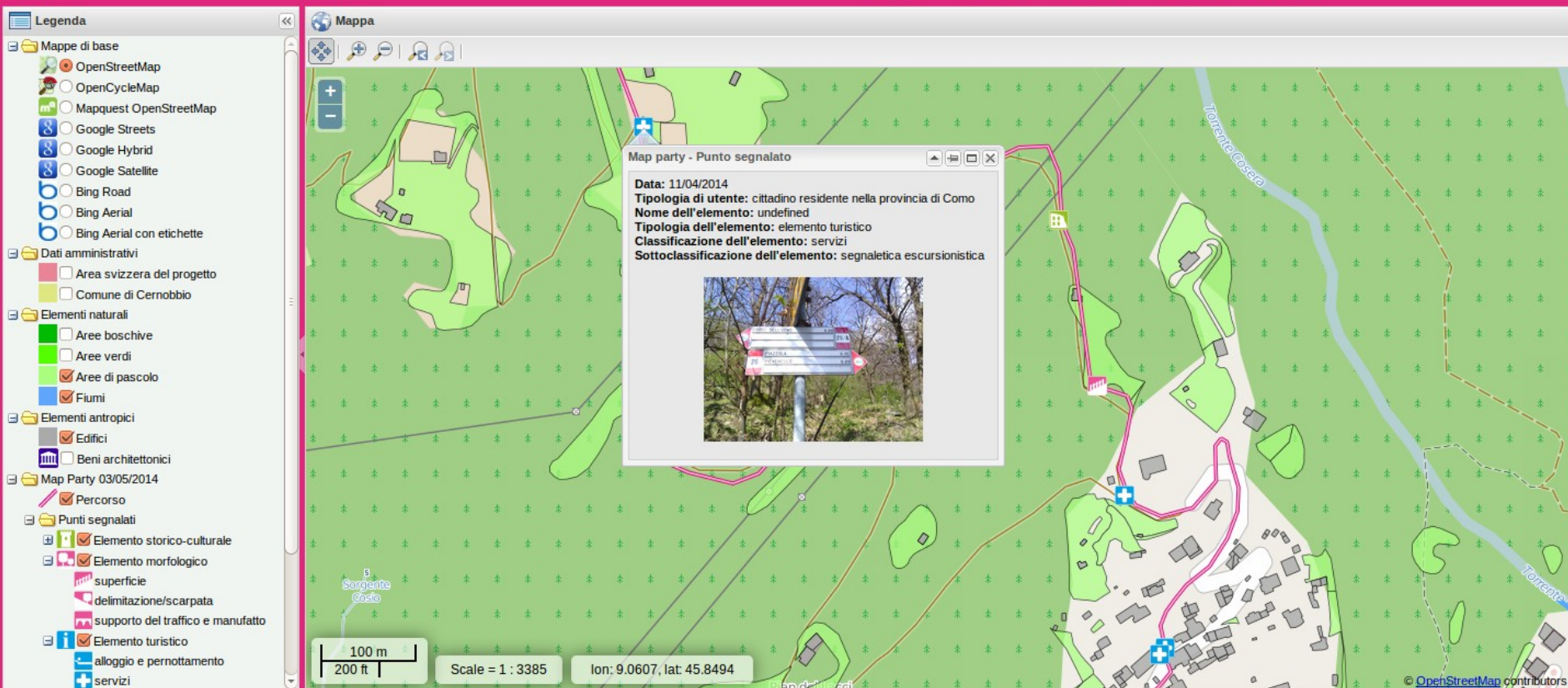


<http://viaregina.como.polimi.it/mapparty>

Via Regina map party



MapParty! 3 MAGGIO 2014


Legenda

- Mappe di base
 - ☐ OpenStreetMap
 - ☐ OpenCycleMap
 - ☐ Mapquest OpenStreetMap
 - ☐ Google Streets
 - ☐ Google Hybrid
 - ☐ Google Satellite
 - ☐ Bing Road
 - ☐ Bing Aerial
 - ☐ Bing Aerial con etichette
- Dati amministrativi
 - ☐ Area svizzera del progetto
 - ☐ Comune di Cernobbio
- Elementi naturali
 - ☐ Aree boschive
 - ☐ Aree verdi
 - ☒ Aree di pascolo
 - ☒ Fiumi
- Elementi antropici
 - ☒ Edifici
 - ☐ Beni architettonici
- Map Party 03/05/2014
 - ☒ Percorso
- Punti segnalati
 - ☒ Elemento storico-culturale
 - ☒ Elemento morfologico
 - ☐ superficie
 - ☐ delimitazione/scarpata
 - ☐ supporto del traffico e manufatto
 - ☒ Elemento turistico
 - ☐ alloggio e pernottamento
 - ☒ servizi

Mappa

Map party - Punto segnalato

Data: 11/04/2014
 Tipologia di utente: cittadino residente nella provincia di Como
 Nome dell'elemento: undefined
 Tipologia dell'elemento: elemento turistico
 Classificazione dell'elemento: servizi
 Sottoclassificazione dell'elemento: segnaletica escursionistica



Scale = 1 : 3385 lon: 9.0607, lat: 45.8494

<http://viaregina.como.polimi.it/mapparty>

Conclusions

- ❖ Web Mapping **2.0 technologies** applied to tourism and cultural heritage
 - upload/**sharing** of geospatial data (for project partners)
 - report of georeferenced points of interest from **mobile** (for common citizens)
 - desktop/mobile **2D viewers** for data display & query
 - management framework for project control & promotion
- ❖ Future outcomes
 - extension of the viewers from the case study area to the whole Via Regina
 - enrichment of the viewers with **processing** functionalities (e.g. computation of terrain profile)
 - **3D viewer** & **Augmented Reality** application

Acknowledgments

- ❖ This research has been funded by the INTERREG “I Cammini della Regina – Percorsi transfrontalieri legati alla Via Regina (The paths of Regina – Crossborder paths departing from Via Regina)” 2007-2013 project.

<http://www.viaregina.eu>

<https://www.facebook.com/viaregina2.0>

Thanks for your attention!

Marco Minghini

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