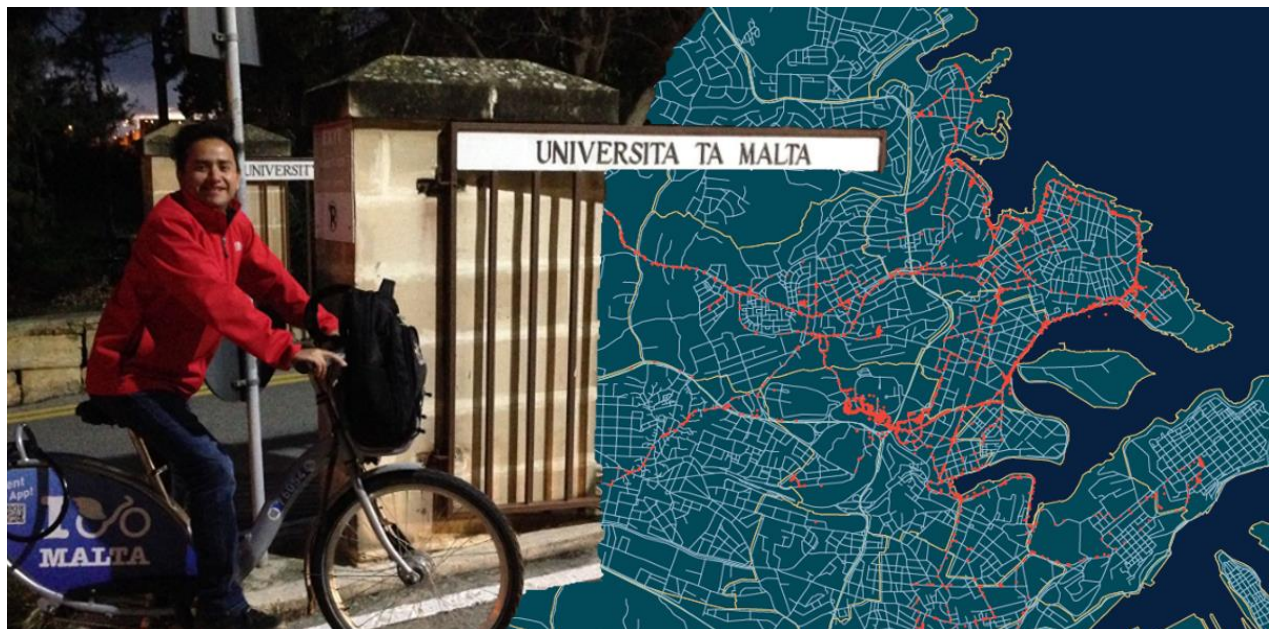


SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

Mapping Urban Cycling in Malta by Diego Fabian Pajarito Grajales



Action Number:
Reference Number
Grantee Name
Institution
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STSM Title:
STSM start and end date:

Mapping Urban Cycling in Malta
09/11/2017 to 18/11/2018 | 10 Days

Host
Host Institution:

Maria Attard
University of Malta

Online Summary

Research Interest:

The use of mobile devices for crowdsourcing geospatial data and promoting sustainable transport.

Summary of research completed in STSM:

During the STSM, the a group of nineteen urban cyclists built the first crowdsourced map of urban cycling in Malta, they recorded more than 17 thousand location points, corresponding to more than 250 bicycle trips, with a gamified mobile application. They also provided information about cycling profiles, use of mobile phones and mobile games as well as their preferences for collaboration-based rewards in mobile applications.

Synthesis and application [of research?]:

The crowdsourced map showed the preferred roads used by cyclists in Malta, mainly associated with flat areas close to the seashore, and the different patterns followed by them when cycling through hilly areas. It also showed how participants reached their home or workplaces by bicycle, no matter if they were located out of the urban areas or in one of the surrounding towns.

Wider benefit of the STSM to the participant:

During the STSM the collected information from urban cyclists in Malta will allow me to compare such patterns with the ones collected in Münster, Germany; and Castelló, Spain. The spatial patterns together with feedback received from participants will complement not only my current research about promotion of sustainable transportation in smart cities but also the local discussion of cycling conditions in Malta. This mission allow me to meet researchers and exchange our ideas that surely will improve my research.

If possible, include a photograph of you alongside your collaborators and a short quote describing your experience.

'In Malta urban cyclists are a small but very connected community, bringing a tool for "drawing" together their bicycle trips was the best test of our platform'

STSM Report

Purpose of the STSM

The STSM aimed to create a crowdsourced map of urban bicycle trips using a gamified mobile application in Malta. During the mission, nineteen urban cyclists contributed by recording their bicycle trips while they tested an experimental mobile application. Researchers obtained two main datasets, first a GIS-compatible file with bicycle trips in Malta, and second, a compilation of cyclists' profiles, use of mobile devices and their motivation for using the bicycle as a mean of transportation.

During the STSM researchers achieved the two defined goals:

- To create a crowdsourced map of cyclists' paths in Malta using a mobile gamified application.
- To compare the impact of competition-based and collaboration-based rewards on satisfaction and engagement of urban cyclist of Malta.

Description of the work carried out during the STSM

The most relevant activities during the STSM were the recruitment 19 urban cyclists, four meetings with participants where they answered the questionnaires and installed the application, the analysis and validation of the recorded information, and the sessions for getting feedback from participants.

Side meetings with researchers from University of Malta brought relevant comments and suggestions for the research:

- Prof. Dr. Maria Attard, Head of the Institute for Climate Change and Sustainable Development.
- Dr Marie Briguglio, Lecturer at the Department of Economics.
- Mark Bugeja, Researcher at the Institute for Climate Change and Sustainable Development,
- Costantino Oliva, Researcher at the Institute of Digital Games.

Suggestions for virtual rewards that complement the application, geospatial datasets to complement the analysis, and game narratives that could fit into the mobile game scope, were the most important outcomes of such meetings.

Description of the main results obtained

The main outcome of the STSM was the crowdsourced map of urban cycling in Malta, made out of more than 17 thousand location points corresponding to more than 250 bicycle trips recorded with the gamified mobile application. The mission also collected data about cycling profiles, use of mobile phones, mobile games as well as the preferences for collaboration-based rewards of participants.

Results contributed to the Cost Action in Citizen Science, the Ph.D. thesis on "Mobiles Services for Green Living", and the Joint Doctorate in Geo-informatics; by the use a mobile platform to connect members of the urban cycling community in Malta and generate a unified geospatial dataset useful for identifying the cycling patterns of urban cyclists as well as for feeding future analysis and research.

The map showed the preferred roads used by cyclists in Malta, mainly associated with flat areas in the seashore, and the different patterns followed by them when cycling through hilly areas. It also showed how participants reached their home or workplaces by bicycle, no matter if they were located out of the urban areas or in different cities. The map and the data used to create it is freely available for participants and researchers from the University of Malta. Therefore future outcomes are expected since the community is active and willing to share and analyse the map.



Future collaboration with the host institution (if applicable)

The research activities carried out by Diego Pajarito and Suzanne Maas are related, datasets of cycling infrastructure and the origin-destination matrix of cyclists in castellón will be shared to feed their research. Moreover, after the STSM, they two will continue sharing information and documents, analysing the map and identifying future collaborations.

Foreseen publications/articles resulting from the STSM (if applicable)

The crowdsourced map was drafted in a Poster to be submitted to a scientific conference within the Geographic Information Science domain in the coming months.

Crowdsourced Map of Urban Cycling

Short Term Scientific Mission, COST Action
 November 8 - 18, 2017, Msida, Malta

Research Question:

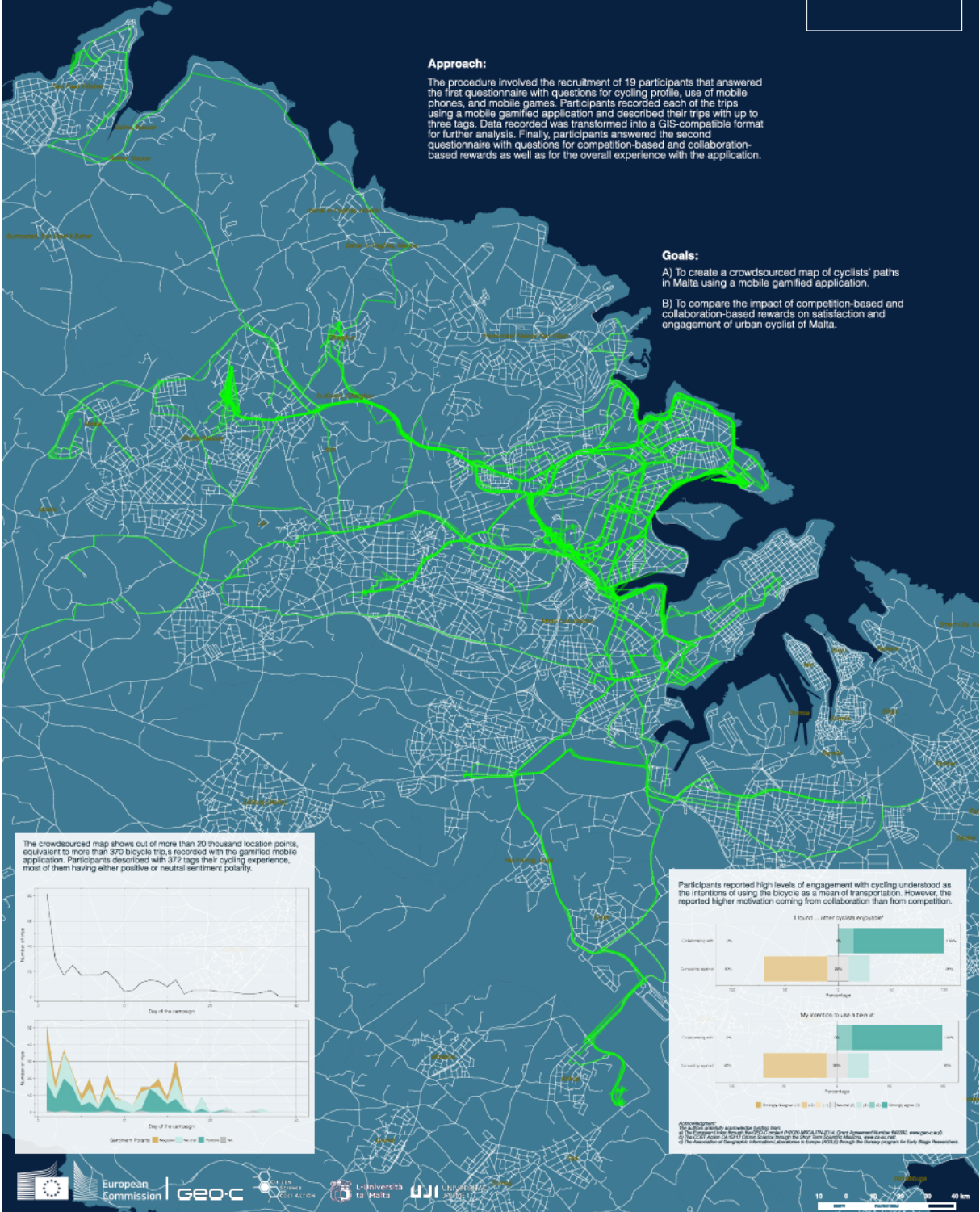
What could be the role of gamified mobile applications, using collaboration-based or competition-based rewards, in the generation of geospatial information of bicycle trips in open cities?

Approach:

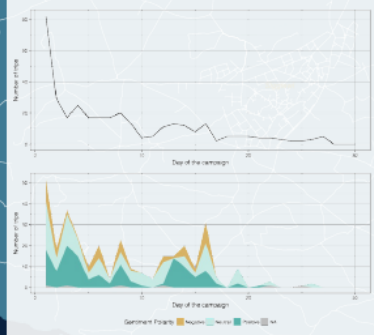
The procedure involved the recruitment of 19 participants that answered the first questionnaire with questions for cycling profile, use of mobile phones, and mobile games. Participants recorded each of the trips using a mobile gamified application and described their trips with up to three tags. Data recorded was transformed into a GIS-compatible format for further analysis. Finally, participants answered the second questionnaire with questions for competition-based and collaboration-based rewards as well as for the overall experience with the application.

Goals:

- A) To create a crowdsourced map of cyclists' paths in Malta using a mobile gamified application.
- B) To compare the impact of competition-based and collaboration-based rewards on satisfaction and engagement of urban cyclist of Malta.



The crowdsourced map shows out of more than 20 thousand location points, equivalent to more than 370 bicycle trips is recorded with the gamified mobile application. Participants described with 372 tags their cycling experience, most of them having either positive or neutral sentiment polarity.



Participants reported high levels of engagement with cycling understood as the intentions of using the bicycle as a mean of transportation. However, the reported higher motivation coming from collaboration than from competition.

