A Mobile Application to Share Georeferenced Tourist Experiences on a Discrete Global Grid

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Agenda

● The Prototype
  ○ Grids Based on a DGGS
  ○ The rHEALPix DGGS
  ○ Architecture and Technology
  ○ User Interface
● Emotional Cartography
● Conclusion and Future Work
The Prototype

- Mobile application with web technologies
- Basemap + standard GIS visualization tools (i.e., zooming and panning)
- A multi-resolution grid is used to make it easy to define areas of interest by just selecting and deselecting cells
- Emotions are then associated to those areas
Grids are Based on a DGGS

- Instead of defining an ad-hoc grid, we have used a Discrete Global Grid System (DGGS)
- According to the Open Geospatial Consortium (OGC), a DGGS is a spatial reference system that uses a hierarchical tessellation of cells to partition and address the globe
- We have used rHEALPix, a Quadrilateral DGGS, because it is easy to work with rectangular cells
The rHEALPix DGGS

Quadrilateral DGGS

The rHEALPix DGGS

Each cell is subdivided into 4 or, as shown in the figure, 9 cells at the next resolution level.

Architecture and Technology
Architecture and Technology

A 3-tier architecture style has been followed for this web application

**Web Application Tier:** Django templates, Bootstrap and OpenLayer, with OSM basemaps

**Web Server Tier:** The Django framework (Python)

**Data Tier:** PostgreSQL and MongoDB

All technologies are **Open Source**

**Github repo:** [https://github.com/IAAA-Lab/grid-field](https://github.com/IAAA-Lab/grid-field)

**License:** European Union Public License v1.2
User Interface

- This is the main interface of the application
- Different base maps can be chosen
- The figure shows OpenStreetMap
User Interface

- The users select and deselect cells just by tapping on the screen of their mobile phones.
- Selected cells are highlighted in a different color.
- In this way, an area can be defined without drawing a vector polygon, which can be uncomfortable on the screen of a mobile phone.
User Interface

After defining an area, the users add the main emotion that the area caused on them (fear, anger, joy...)

![User Interface Image]
Emotional Cartography

- A methodological process to represent the emotional spaces that form the territory
- Emotional spaces can be analyzed alongside the physical spaces
- Spatially diffuse areas are to be expected, and the emotions may vary a lot among scales
  - For example, a city in general may elicit joy, and a particular neighborhood can cause intense fear or disgust
- The multi-resolution grids of a DGGS seem adequate to analyze this kind of data
Emotional Cartography
Conclusion and Future Work

- The prototype for capturing tourist data on grids based on DGGS is nearly finished.
- The use of the DGGS provides standardized, well-defined and well-behaved grids for the data capture.
  - But also the promise of simpler data analysis and integration.
- We are working to define and carry out experiments with users.
- Analyzing the captured data and producing useful, beautiful, and innovative emotional cartography with them will be the next task.
- Discovering patterns in those emotion-related data should provide additional insights about the territory.
  - Not usually considered in traditional cartography.
Thank you for your Attention

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