Application

Title

Liqen: can you see the stars?

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Description

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LiQen Project (http://liqenproject.org/) seeks as its general aim to collect qualitative data from citizens, through crowdsourcing methods using web and mobile apps, aimed to discover controversies among cities in the world.

A controversy in this context occurred when different norms and laws inform us about the acceptable level of different variables in our cities, such as level of noise or light pollution. We planned and design our life in terms of those variables and its magnitude, which are given to us as a rigid or set parameter, sometimes without range to interact and evaluate if this norms and laws based on data and algorithms are the appropriate for our health or well being in general. Due that situation, ask and collect perceptions turns on a valuable asset to understand when the norm is not applicable or if it has not a concordant with particular situations on a small part of the city. Also it is becoming more relevant nowadays to curate machine/sensor data with human perception, to calibrate those algorithms, through hybrid machine/human systems.

At the moment in Liqen we have created a prototype which have been developed and presented at Visualizar 2016 (Medialab Prado, Madrid), where we compared noise pollution data from smart citizen environmental sensor network (https://smartcitizen.me/), against data harvested for volunteers in three different cities: London, Madrid and Santiago. Our goal was to visualize identify if there is a controversy among the World Health Organization acceptable noise levels; machine sensors data (smart citizen network); and noise levels perception, collected from citizens. The outcome of that project is that people perceive even more noise pollution than sensors for those three cities.

In this context, today our goal is to expand our method to compare levels of light pollution at night in cities across Europe, seeking to identify if there is a controversy between what machine sensors are reporting and what is people watching *in situ* at the same locations.

Method

Our slogan for LiQen/Light is "Can you see the stars?", due that we want to invite citizens to see the sky during the night and report how many stars they can see, using their cell phones. For visual perception we want to use a system to evaluate cloud concentration called 'Octal'.

Octal was used mostly for farmers to count clouds in the sky. They divided the sky in 8 equal parts to report how many of those parts were covered by clouds, determining if the sky was totally or partially clear, or if it was completely clear. We want to bring this method to a smartphone app, to count stars on those parts on the octagon which is not covered by clouds. We assign a value to that perception in terms of '*less stars = more light pollution*', and then compare against the data provided by the machine sensor in that location.

At the same time, we provide in a cartographic model a representations of the levels of light pollution for cities in Europe, using data visualization as a tool for an emotional engagement with the problematic.

Outcomes

We will have three main outcomes. All open sourced:

- **Method**: a method to compare quantitative and qualitative data for light pollution.
- **Mobile app:** an app to harvest perception about light pollution using octal method.
- **Visualization:** a map and graph fed by machine sensors data and human perceptions.

Stakeholders

- **Researchers:** academics and/or citizen scientists concerned about the effects of light pollution. Also researchers who wants to use and improve our method to collect light perceptions.
- **Government:** local Government mainly who wants to design their public lighting, adding a citizen view of light perception.
- **Data Scientists:** consuming data to create new insights, reports or visualizations.

Light Pollution Data

A. **Quantitative Data (Photometers):** In terms of data, we will data from Stars4all photometers api for different cities in Europe.

B. **Survey:** to collect perceptions, we will use and improved version of our survey, which is now used to harvest data related to noise pollution. We have gathered a group of specialist in sociology and environmental issues to create a qualitative instrument which reduced bias and is weighted accordingly to the relevance of certain variables. This survey might be prepared accordingly to actual legislation, effects of artificial light in humans, age, location, some physical conditions (as reduced vision), among other variables.

Open Data

We will create data which is going to be open as:

- **Perceptions:** crowdsourced data using LiQen will be open for public access through an api.
- **Visualization:** we will provide the source code for our visualization in github.
- Method: our method will be open to be use or/and modify for other researching groups, using creative commons license.

Support

We have developed Liqen with the support of Common Action Forum, an international non-profit foundation established in Madrid, Spain, in 2015 to build independent platforms of cooperation, research, innovation and advisory, empowering global citizens to address socio-political issues and economic inequalities. Through them we have access to funds for some tools (web domains, server) and a platform for diffusion and networking.

List of actions to carry out within the LPI

1. Create the qualitative instrument to collect perceptions: we already have a method for noise perception, and we have capacity to create a new instrument for light pollution, but we think is a good idea to ask for mentorship and collaboration to LPIs.
2. Pipe to Stars4all photometers api: as we use Stars4all data.
3. Comparison and Visualization: we have the capacity to create tools to compare quantitative and qualitative data, and to develop visualizations. We will also required mentorship from Stars4all network in this specific topic (light pollution).
4. Crowdfunding to: (i) develop a mobile app for sky watching; and (ii) develop an Api to provide perception data for general public.
5. Networking to participate in events to promote the project in academia and citizen science projects.