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## **Introducing iCUCHA**

We present a mobile application for iOS system called iCUCHA. It is suited for iPhone, iPad and iPod touch devices. It has been designed to gather information from the citizens regarding what people feel about the ambient noise created by different sources.

We use the geolocation facilities of mobiles devices. The user only have to enter the perception of noise disturbance, the cause of that, and if the noise is outside or inside its current position. Date and user location are information automatically added to our database.

By using all the entries at our database, the app is able to draw in map all the contributions of the citizens. The user not only sees its own contribution but what people feel around him/her about noise.

We ask about noise perception, but we could also ask about pollution perception, cleaning of the streets, police coverage, and so many more questions of high interest for city hall or government.

With that idea in mind, we included in its design versatility extend of this mobile application by enabling that all the query parameters (degree of disturbance, cause of the disturbance, situation of the source of disturbance) have been allocated outside of the app. Changes in these parameters are done by simple editing a plain text file. Not rebuild of the app is needed; no new application version is required.

## **Current mobile applications market**

The majority of mobile applications that can be accessible through common distribution channels (AppStore for iOS, Google Play for Android, World App for Blackberry) explore the analysis of noise in the same way: they perform a recording of the noise around an interval or 10 seconds, and give the average of the decibels recorded to ignore sound peaks. So the data is not exact, but most importantly, the data is a numerical measure, not the perception of the people affected by noise. As an example consider this situation: someone with headache could feels 50dB as disturbing while other person (sitting beside) could perceive it totally different and even opposite. In this scenario, both users would send the same data but with different perceptions behind.

Examples of mobile application that perform measures of noise are:

- Too Noisy app  
Anyone who has attempted to keep the noise levels under control of a group of youngsters will appreciate this simple, fun and engaging app.



- Decibels app  
Want to know what noise level is around you? in the restaurant? in the train? in the office? This app will show you.





- Noise Watch app

Environmental noise is one of the most present pollutants in the world today, with potential negative impacts on your health. The NoiseWatch app uses the built in microphone on your hand held device to determine the level of sounds it detects, and displays this in decibels (dB).



- Noise Meter app

Noise Meter is the one you should download as soon as possible, without difficult setup. Just click the "noise detection" button, and then you get everything you need. Show iPhone to your friend, which their cell phone can never so cool.

Noise meter build a Noise Advisor which remind you the noise level by a live style language instead of technical alter.

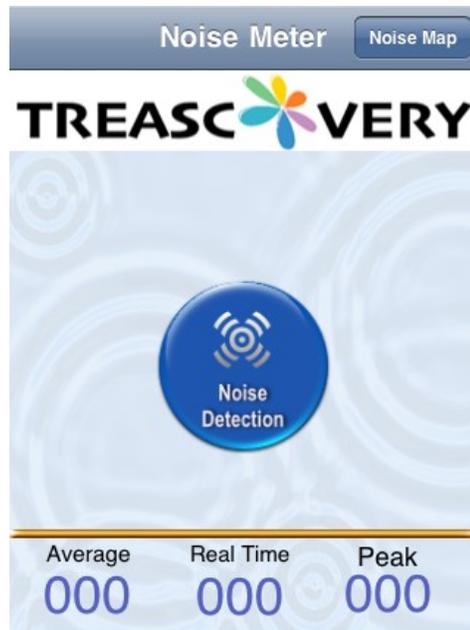
Below is the list of Noise Advisor:

- 0-20 : Quiet, suitable for living & sleeping
- 20-40 : Comfortable, suitable for office
- 40-60 : Busy, suitable for business

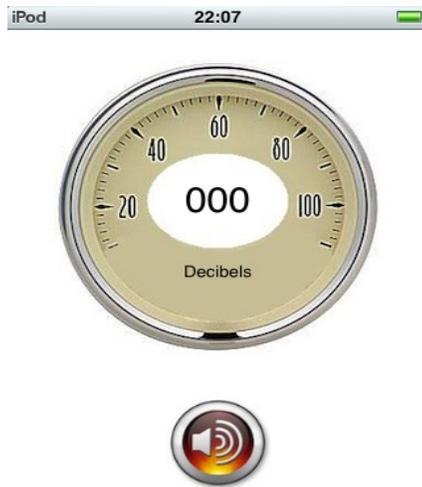


- 60-80 : Bustling, suitable for traffic
- 80-100 : Noisily, suitable for factory
- >100 : Terrible, don't stay for health

Noise Meter does not use industrial standard (dB), instead of (dB), Noise Meter bring you a funny tool to utilize iPhone feature.



- Sound Measure app  
Sound Measure is an easy way to find the sound level in decibels. Currently, it measures from 45 to 85 dB at the push of a button.



- Decibels 10<sup>th</sup>  
Decibel 10th turns your iPhone, iPad and iPod touch into a professional sound meter, precisely measures the sound pressure level all around you. This extremely useful and beautiful tool will not only be a great tool for many uses but also bring you a lot of fun. Have you wondered how quiet is your room or how loud is a rock concert or sport event?





## Our project:

In this section we describe our application.  
We also show images of the application main features.

When the application is started, after a splash image, it shows the two main actions that can be performed.

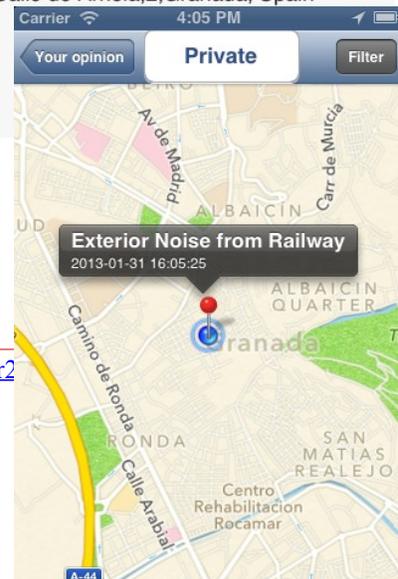
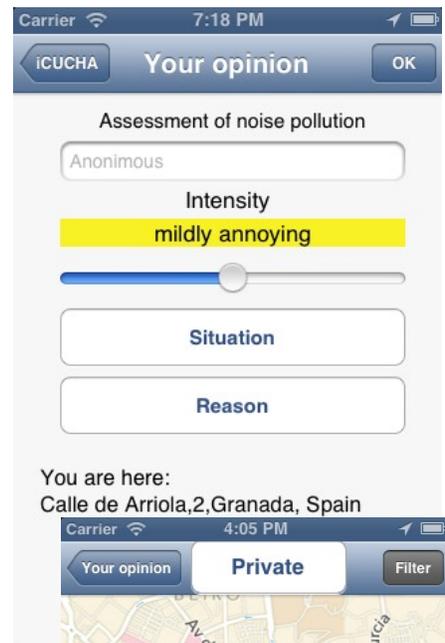
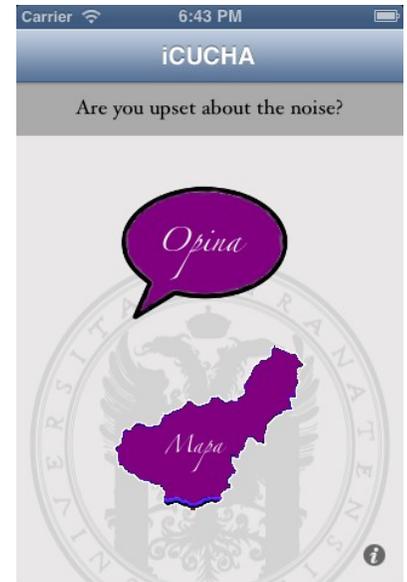
- *Opina / Give your opinion*: To give the opinion about the noise.
- *Mapa / Map*: Show all the user contributions in form of city map to discover what places are the loudest.

If we select “Opina”, it appears a window with many options:

- Name of the person who is going to notify the alert (optional).
- Intensity of the sound. We choose the level appreciated, and the level bar update with a colour associated with that entry. Later, the pin that will be shown on the map as resulting of this entry shall have the same colour.
- Situation where the user is located. When we select this button, it then appears a list of different situations to choose. We can select between exterior or interior noise, but this list is easily configured.
- Cause of noise disturbance. As with the previous, a list will follow to select the cause of the noise that we perceived. A free text option is enabled to describe any other cause which is not listed.

When all the fields are completed, we press OK

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to send the notification to the system and subsequently add a pin to the map.

If everything goes well, the system shows a confirmation message and the map view will follow showing all the pins.

In this map view, if we select the pin, our situation, reason, and date of the entry were also shown.

Besides, the pin colour also indicates the level of intensity selected.

In this view, it is possible to filter what is displayed (the total of pins which appears) by means of a date filter. To select this option just press Filter button at the right top of the view.

In the Filter view, firstly, we have to activate the switch enable to show the start/end dates. After that, we configure the dates which applies to the filter. Just by press the Save button we will see the filter applied to the map. Pins will be displayed according to the filter.





If we select the “Private” button and log in correctly (with an administration user and password), we could access to functionality hidden to the vast majority of users. Only few people (the project team) can collect system statistics. That will be so important for the UGR research team that could have the core information of the system any time and anywhere, just in the same app.

The information that we get are

- the date of the last entry at the system
- total number of pins / user contributions
- total pins per colour categories (intensities)
- total pins per causes

The reader should note that intensities and causes lists are configured externally to this app, and that the statistic functionality is not dependant of these lists, so we have a very adaptive interface.

