# Biodiversity assesment of bats population at an urban scale through dense cover of ultrasonic sensors

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**Abstract**

We will introduce in this talk a first temptative to deploy massively distributed network of ultrasonic sensor in order
to assess bat population at a scale of tens of kilometers. The area considered in this original experiment is the city

of Grenoble, France, including suburban cities. One of the particularity of this city is to lay down an alpine valley sourrounded

by three montains area. We expect that some of the bat species living in the area of Grenoble, just live in the cliffs and may fly over the city during the night in order to reach their breading areas. This is the case for example for Tadarida Teniotis that have been observed in the past.

However, like many others big cities in the world and for the many bat species that may live in urban areas (more than ten in the case of Grenoble), there is a deep lack of knowledgde cocnerning the repartition and the locations of bat roots, as well as the density of bat populations.
Since the only solution to detect bat lies on ultrasound detection, two ideas have emerged to try to fully understand the population dynamics :

1. to put a sufficiently large amount of ultrasonic sensors connected on the web and transferring the detection statistics on the web,

2. to invite the population to use their smart phone /computers connected to ultrasonic sensors, and let them outdoor to detect the bas calls,

Many high quality smartphaone have now built-in microphones that can record sounds up to 24 Khz, thus detecting the low frequency bat species.
We finally explained how we plan to reach a critical number of sensors of good quality all over the Grenoble valley to have one of the clearer view of bat population density estimates that have never been obtained before.

**Keywords:** low cost ultrasonic detection, bat population density estimates, network of connected sensors

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