



Noise in Physical Systems Laboratory

Department of Physics, University of Perugia – I-06100 Perugia, Italy

PRESS RELEASE

08.09.2012

Mapping a vibrating world

A new application for smart phone has been launched by the NiPS Laboratory at Perugia University – Italy, to measure renewable kinetic energies sources around us.

Think of whatever questions you want. Most likely you can download an application and install it on your smart phone to answer the question and satisfy your curiosity.

It has been going on like this over the last few years and it will continue in the future, but an infinite number of questions are still to be answered and new applications will be created to fulfil the task.

Scientific curiosity, creativity and technology together can generate new unexpected applications like the brand new one called *Real Vibrations* conceived by the NiPS Laboratory at the Department of Physics of the Perugia University in Italy (www.nipslab.org) whose director, Luca Gammaitoni coordinates some of the main European projects in the field of energy efficiency for ICT.

Real Vibrations is now available for free from App Store (at <http://realvibrations.nipslab.org/iPhone>) and the questions it tries to answer turns up to be crucial for the future of ICT: where can we go and find new sources of renewable energies for electronic devices? How much energy can we recycle converting the vibrations around us into electrical power to be used for portable electronic devices?

The basic idea behind *Real Vibrations* is very simple: all the objects around us vibrate due to different reasons. These vibrations are too small to be perceived by our senses but not too small for the sensors in smart phones that can perceive and measure them. Together with an intelligent use of these sensors a software had, in fact, to be developed to measure these vibrations and to figure out how much electrical energy can be recovered turning these vibrations into ordered energy. This software was developed by the NiPS Laboratory within its research activities in the field of energy harvesting.

So if you install *Real Vibrations* on your smart phone you are immediately involved in a research project. Each time you will switch on the app, in fact, your phone will record the vibrations of the object it comes in contact with and measure it. Then you decide if you want this information to be transmitted to the NiPS



database. If so, the App connects to the Internet and upload the signal you measured to the NiPS system. The data will be immediately recorded in the archive available at the address realvibrations.nipslab.org.

The realvibrations.nipslab.org web site hosts a digital database containing numerical time series and spectral representations of experimentally acquired vibration signals.

As a matter of fact, in this way you are contributing to the advancement of science because this information is extremely useful to the NiPS scientists who are trying to create a map of objects and actions with the associated vibrations and available energy. The NiPS Scientists are developing efficient systems that can convert this energy in usable electrical power that one day will substitute batteries in electronic devices. The map of such sustainable energy “mines” combined with the proper technology to extract this energy from the mine aims at triggering the next century industrial revolution.

Most importantly, Real Vibrations is a participatory research project that aims at creating the world largest repository of vibrations recorded from everyday life objects and people movements. Cars, trains, airplanes, and even human beings, constantly “vibrate” and these vibrations can be recorded with various devices and stored in such a way that they are readily available and easily usable both by researchers and non-expert visitors of the site.

A database of vibration data is a map of the moving world. To many this is of no meaning and little use. To NiPS researchers, *cartographers* of a hidden world, this represents a map of potentially useful energy. In a near future at NiPS they believe that this micro-generators that transform vibrations into electric energy will be able to integrate and/or substitute the existing batteries for a better and healthier planet.

Real Vibrations is developed under the Nanopower project (www.nanopwr.eu), that acknowledges the financial support of the Future and Emerging Technologies (FET) programme within the ICT theme of the Seventh Framework Programme for Research of the European Commission (Grant Agreement n. 256959). Among the thousands applications *Real Vibrations* was missing indeed, but now is there ready to be used.

Pictures available at: <http://realvibrations.nipslab.org/iPhone>