



## **Design and Optimization of a Telemetric system for appliance in earthquake prediction**

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This project's aim is to design a telemetric system which will be able to collect data from a digitizer, transform it into appropriate form and transfer this data to a central system where an on-line data elaboration will take place. On-line mathematical elaboration (fractal analysis) of pre-seismic electromagnetic signals and instant display may lead to safe earthquake prediction methodologies.

Ad-hoc connections and heterogeneous topologies are the core network, while wired and wireless means cooperate for an accurate and on-time transmission. The nature of data is considered very sensitive so the transmission needs to be instant. All stations are situated in rural places in order to prevent electromagnetic interferences; this imposes continuous monitoring and provision of backup data links. The central stations collect the data of every station and allocate them properly in a predefined database. Special software is designed to elaborate mathematically the incoming data and export it graphically.

The developing part included digitizer design, workstation software design, transmission protocol study and simulation on OPNET, database programming, mathematical data elaborations and software development for graphical representation. All the package was tested under lab conditions and tested in real conditions.

The main aspect that this project serves is the very big interest for the scientific community in case this platform will eventually be implemented and then installed in Greek countryside in large scale. The platform is designed in such a way that techniques of data mining and mathematical elaboration are possible and any extension can be adapted. The main specialization of this project is that these mechanisms and mathematical transformations can be applied on live data. This can help to rapid exploitation of the real meaning of the measured and stored data. The elaboration of this study has as primary intention to help and alleviate the analysis process while triggering the scientific community to pay attention on seismic activities in Greece watching it on-line.