



**Doctoral Thesis Title:** A computer support system for a biometeorology research with emphasis on spatial storage and processing data

**Supervisors:**

Ángel Marqués Mateu. Departamento de Ingeniería Cartográfica, Geodesia y Fotogrametría. Universitat Politècnica de València.

Laura Sebastiá Tarín. Departamento de Sistemas Informáticos y Computación. Universitat Politècnica de València.

Pablo Fernández de Arróyabe Hernáez. Departamento de Geografía, Urbanismo y Ordenación del Territorio. Universidad de Cantabria.

**Abstract:**

Data are a fundamental piece of any type of study or knowledge basis. Nowadays exist different paradigms on using, processing and analysing data. The emergence of diverse technologies for storage systems, processing and data analysis has given an answer to different issues related to variety, volume and velocity of data production. Currently, information sources are countless. Sensor technologies or phenomena measuring are constantly generating huge amount of data, that are published on-line in order to extract data knowledge trough Web Service. Open Data concept is an example of newly-made broad range source of information which covers multiple phenomena typologies, formats and continuous data production but with a feature that distinguishes it from other sources of massive data: the possibility of reuse by third parties with "regular resources". In this context data origin is a key aspect for the quality of any work and the success in achieving the stated goals based on data employment. Data management is another key aspect in projects whose objective depends on the exploitation and analysis of the mentioned data. Defining the system in charge of data storage is necessary for solving the problems that come from a project. Data by themselves not generate knowledge and if we want to extract value, it is important to perform an adequate management for processing and analysing them. The typology and the variability of the data entail a great challenge in the management of information. Therefore, this study will establish a data management scheme considering the variety, volume and velocity of data production, applying Big Data techniques. The main objective is to carry out a study of the global behavior of a Biometreological index, concretely the Atmospheric Oxygen Difference (commonly known by the acronym DOA), which has important effects on different indicators related to public health and environment. Large amount of data will be processed, with different formats and coming from multiple sources of information in order to obtain deep knowledge of the studied variable; it will be defined data sets related to meteorological variables and data sets related to the population. During the thesis the appropriate sources of information will be defined to obtain quality and suitable data for the study. One of the characteristics of the data used is its spatial attribute, so as we should consider all aspects related to georeferencing, especially the reference systems of each data set, the transformation between reference systems and the geospatial data formats. A workflow will also be defined to process and analyse data with Data Mining techniques, searching to set an optimal procedure adapted to the problem, in order to establish an innovative study methodology that has the greatest impact possible in the scientific community as in today's society.



### Available Means:

To achieve the overall goals of this doctoral thesis there is a PC for the development of software placed in the Department of Cartographic Engineering, Geodesy and Photogrammetry of the Universitat Politècnica de València. There is also a server installed at the University of Cantabria for the deployment of some system components. The subject of this doctoral thesis is multidisciplinary, the directors belong to three departments of two Spanish universities that will provide support in the different phases of the thesis project. In particular, one of the co-authors is the president of the International Society of Biometeorology (ISB) who will provide support in the initial phases.

### References:

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