# TEACHING DIGITAL MAPPING WITH A DEVOTED VISUALIZER

V. Casella (1), R. Galetto (2), A. Spalla(3)

DIET – Università degli Studi di Pavia, Pavia, Italy
email: casella@unipv.it (1)
galetto@unipv.it (2)
spalla@unipv.it (3)

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## ABSTRACT

The main features of a digital map visualizer, called SIRO, are illustrated. The program has been carried out at the University of Pavia and is freely available.

## 1. THE AIM OF THE PROJECT

The Geomatics Laboratory of the University of Pavia has implemented a freeware digital map visualizer software called SIRO. The main purpose of this project is to improve teaching and to give to the whole Italian photogrammetric community (researchers, industries, final users) a common and easy way to exchange and visualise digital maps.

SIRO runs in the Windows environment and it manages the so-called DCT data format, which is the most widespread in the Italian photogrammetric industry. DCT data format describes object shape by means of point and polyline geometric primitives. It is also able to describe their nature since it includes a very simple data base structure, based on a alphanumeric code, which allows to classify, in a hierarchical fashion, map entities.

## 2. SIRO'S MAIN FEATURES

SIRO has the main functionalities needed to visualise and query a digital map (Figure 1). First of all it displays on the screen map's entities and toponyms using colours and embellishments such as building fillings, tree symbols, etc. There is a **zoom** function, which works in the obvious way, and there is also a **superzoom** function: the zoomed map is displayed on a new, independent window (Figure 2), rather than on the standard one; this function allows the user to have on the screen, at the same time, the whole map at a low scale ratio and the zoomed view of a part of the map in another window. There is also the **move** function, by which the user can move the display window on the whole map.

It is also possible to **query** entities picking them on the screen with the pointer: a message box is opened, showing the selected entity database information (code, colour and level) and also some geometric data, such as its length and area.

There are several ways to make **selections**, that is, to choose criteria by which to show or not to show entities (Figure 3). There are filters based on geometrical aspects, such as being a polyline closed or being a polyline a spot, that is constituted of only one point. There are selection criteria depending on codes: it is possible to display (or not to display) entities whose code belongs to a certain, user defined, code set.

SIRO allows the linking of textual files to each map entity, so that it is possible for example to associate a textual form with the name of the owner, or the names of the inhabitants, to a certain building. It is also possible to link graphic files to entities, so that it could be possible to associate a certain building to its picture (Figure 4). When an entity linked with textual or graphical information is queried, the program will show, together with the

standard database information, the linked one. These SIRO's features resemble GIS characteristics, but SIRO has at the moment no capability to manage extended data. Moreover SIRO does not have autonomous image display capabilities, but it takes advantage of the Windows most common tools.

## 3. DATA EXCHANGING

SIRO is continuously under development. Recently data exchanging possibilities has been improved. First of all a DCT ASCII format have been defined (DCT standard data format is actually binary): it is very easy to understand, to read and to write. We think that it shouldn't be difficult to transfer digital map data from any format to this one. We have also developed a translator software, called DCT_T2B, able to bring DCT ASCII data to the binary format. Our aim is to give everybody the possibility to translate its own digital maps to DCT format and then to use our free SIRO.

There is also a program able to transfer DCT digital maps to the DXF well known format. It is not free, even if it is cheap, because it has been developed by a software-house under our supervision.

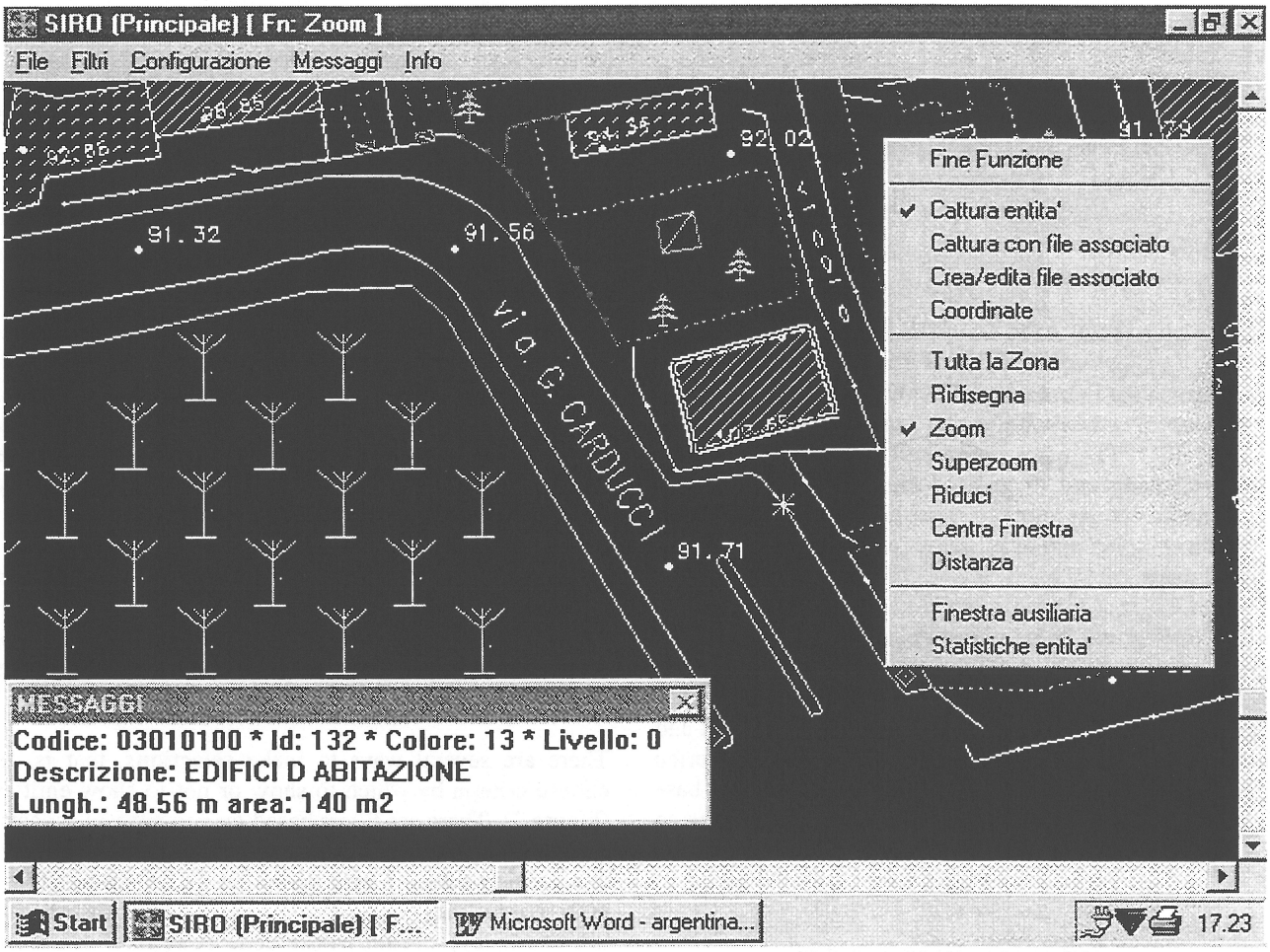


Figure 1 - SIRO has the main functionalities needed to visualise and query a digital map

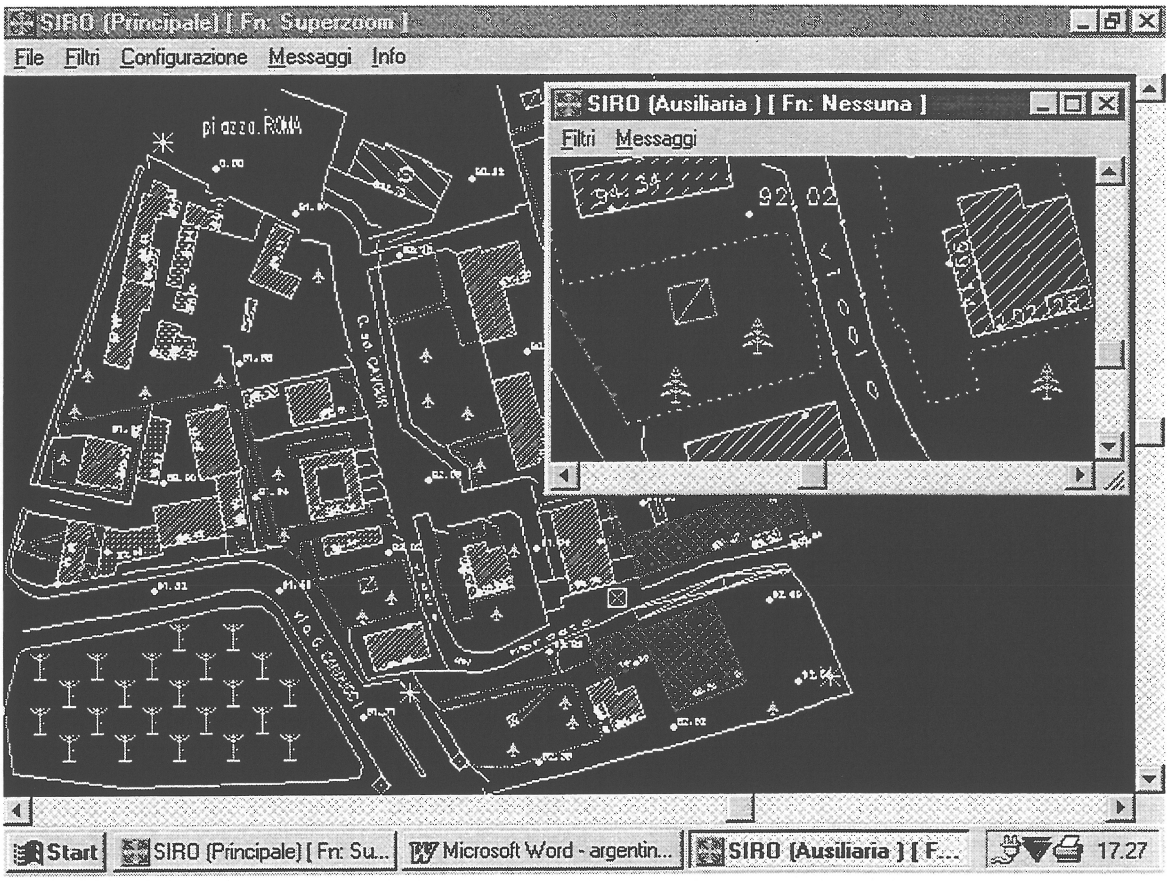


Figure 2 - **Superzoom** function

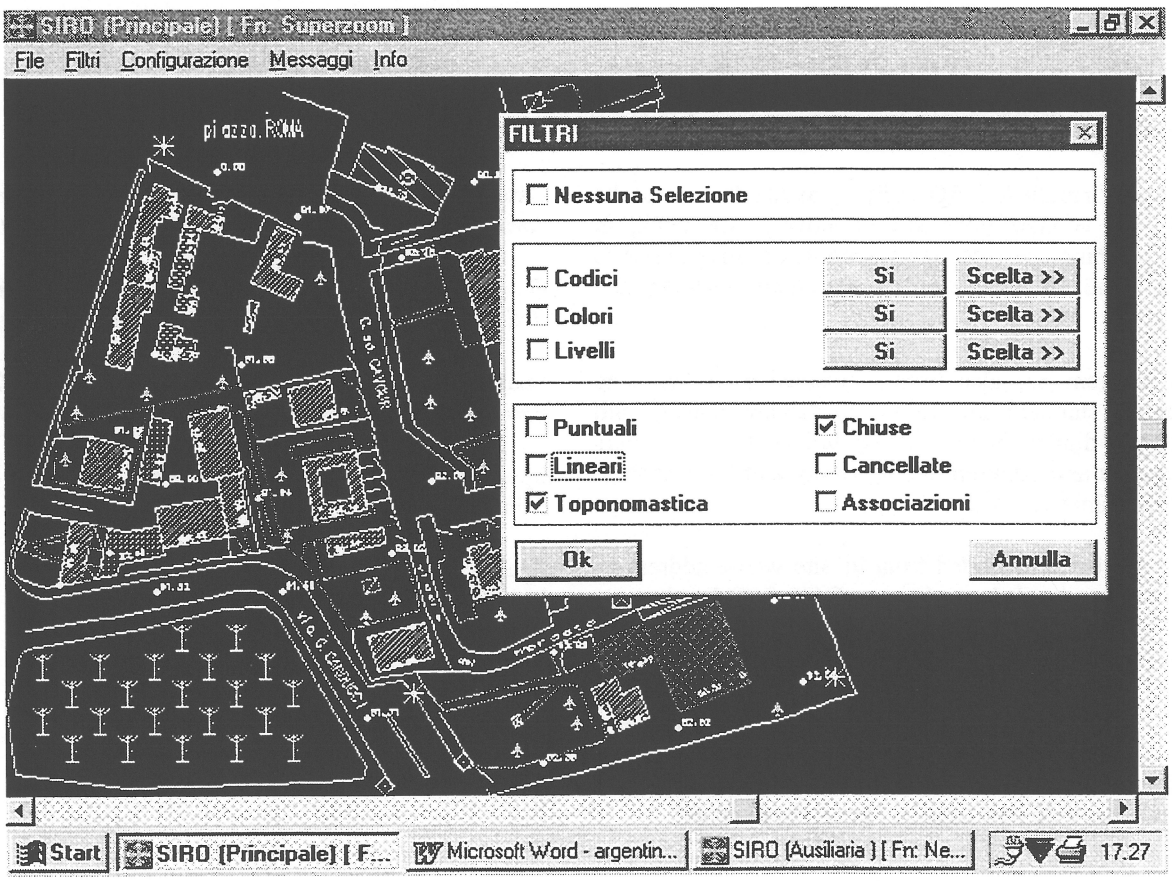


Figure 3 - How SIRO makes **selections**

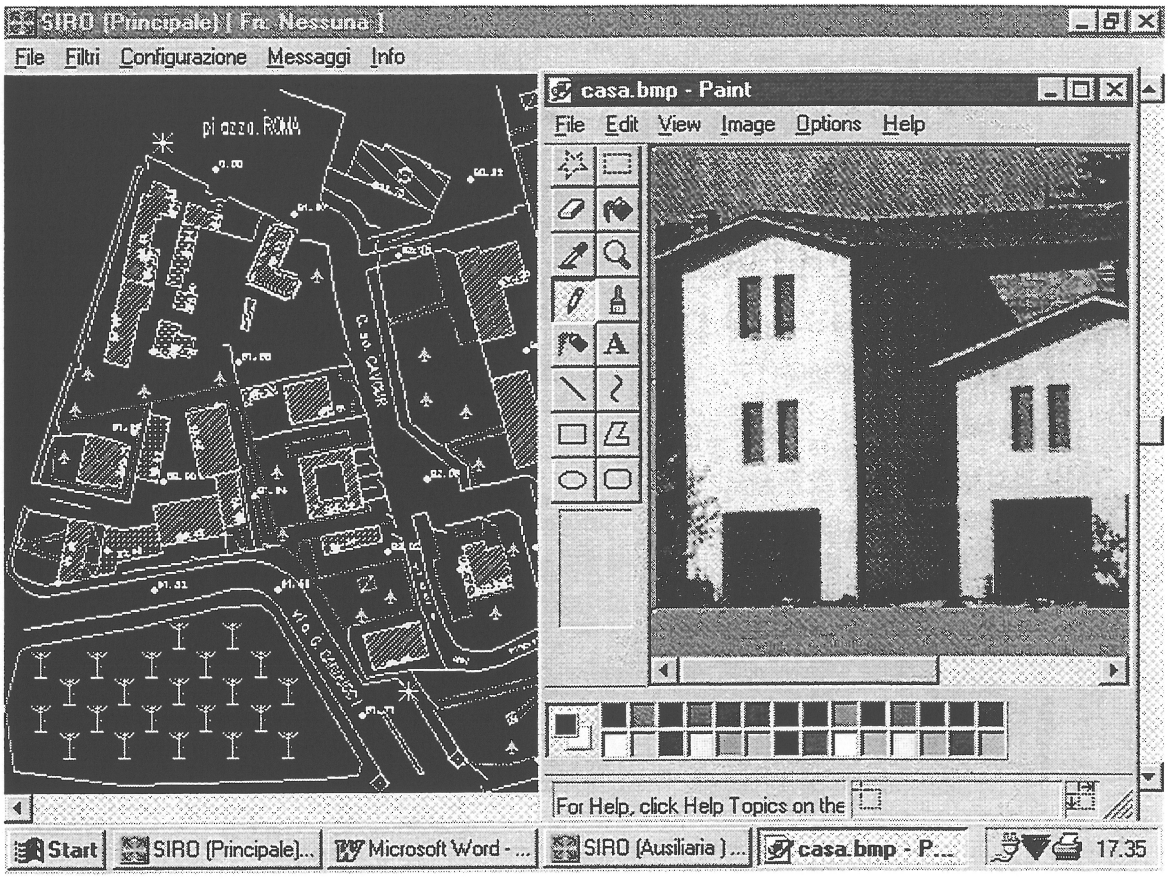


Figure 4 - How SIRO associates a certain building to its picture

## 4. CONCLUSIONS AND SIRO'S AVAILABILITY

As already recalled, SIRO is freely available and can be used both economically and effectively, we think, in every teaching site (secondary schools or universities) to explain and to show digital map main features and concepts.

This program has also been conceived as a first step towards a standard data format to display, manage and exchange digital maps among university researchers themselves and between the university and the industrial photogrammetric world.

SIRO can be downloaded from its site whose address is: `www.unipv.it~labgeo/siro`; DCT_T2B has its own site: `www.unipv.it/~labgeo/dct_t2b`. Both programs can be freely downloaded and redistributed.

The SIRO's development effort has been partly sustained by MURST, the Italian University and Research Ministry, under the umbrella of the national research project: "Metodologie avanzate per il rilevamento".

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