

AU3-Win a Digital Photogrammetric Workstation Developed in Mexico A step in favor of Agenda 21

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ABSTRACT

AU3-Win is a digital photogrammetric plotter developed by CartoData, which includes: tools for 3-D data capture and editing, fast TIN and contour generation, aerotriangulation point transfer and adjustment, automatic DTM extraction by image correlation, a very user-friendly user interface, and orthophoto production. Its low cost and high productivity are highlighted in the presentation; summarizing the experience of over 100 users. With AU3-Win CartoData intends to promote geomatics education and culture worldwide.

RESUMEN

AU3-Win es un restituidor digital desarrollado por CartoData en México. El sistema incluye herramientas para la restitución y edición en 3D, generación de curvas de nivel, medición y ajuste de bloques de aerotriangulación, generación de DTM por correlación de imágenes, un sencillo interfaz de usuario, producción de ortofotos. Su bajo costo y alta productividad se exponen en el texto, resumiendo la experiencia de más de 100 usuarios. Con el AU3-Win CartoData pretende promover la educación y cultura geomática en el mundo.

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1. WORLD IN CRISES



Responding to the challenges of global urbanization, poverty and environmental degradation, national governments at the United Nations 1992 Conference on Environment and Development agreed on the concept of Sustainable Development as a general principle for policies and actions (United Nations 1992). Sustainable Development was defined by the World Commission on Environment and Development as “development that meets the needs of the present without compromising the ability of the future generations to meet their own needs”. The Rio Conference agreed on a program for the implementation of sustainable development in the twenty first century known as Agenda 21.

2. WORLD NEED FOR BETTER MAPS

The International Federation of Surveyors (FIG) (Onsrud, 2001) recognizes that the geomatic professions play an important role in implementing sustainable development through the planning and management of land, sea and water resources, the registration of property and the handling of geographic information. FIG Agenda 21 supports the concept of sustainable development and identifies three domains of professional activity where the geomatic professions can make a significant contribution:

- Access to land and security of tenure (cadastre)
- Planning and management of land and coastal areas
- Geographic information for decision making.

The document underlies the growing gap between developed and developing countries in terms of their capacity to collect and disseminate geographic information, and the challenges that developing countries must overcome in order to make adequate land and resource management decisions.

3. WHAT IS AU3-WIN

In responding to this challenge, CartoData, a Mexican mapping firm developed AU3-Win, a digital photogrammetric plotter, which we believe to be an important step towards simplifying base map production for world needs.

4. WHAT IS RELEVANT ABOUT AU3-WIN

Two important issues have been considered in designing AU3-Win:

- High productivity and performance through a simple user interface
- Modest hardware requirements and low cost



AU3-Win in use

Without the clutter of menus, buttons and dialog boxes found in other softcopy systems, that can quickly lead a beginner to confusion and frustration, AU3-Win's entire workspace consists of only the stereo model. Function selection is made from a popup toolbar that is accessed by clicking on the mouse right button. This toolbar contains the basic and most common functions the user will need for editing, compilation, layer selection, zooming and measuring. There is a menu button that allows the user to access the rest of the functions as well as the more specialized tools such as model set up or orientation, aerotriangulation, contour generation, DTM extraction, etc. After function selection, the toolbar disappears and the user returns to stereoplotting.



AU3-Win toolbar

In spite of its simplicity, AU3-Win is a full blown photogrammetric system with tools for automatic orientation and point transfer for aerotriangulation, DTM extraction and contour generation, orthophoto production, and close range photogrammetry.

Based on the experience of more than 100 users we have found that a common mouse (with a wheel used for Z movements) is as good a stereo pointing device as any of the more complex

solutions such as 3D mouse or hand wheels. The latter softcopy system solutions were designed only to mimic the handling of traditional analogue and analytical plotters.

Compilation is accomplished using the computer's mouse and keyboard and a single monitor on which the 3D model and vectors are displayed. The user can open a window that shows the vector data in 2D, thus making a second monitor unnecessary..

The system's modest hardware requirements allows anyone to turn a computer into a photogrammetric workstation. There is no need for special video cards or hardware other than the viewing glasses. A single 17" inch monitor, a Pentium III 600Mhz computer with 256 megabytes of memory and Win-NT or Windows 2000 is all that is needed. This makes AU3-Win a very affordable system.

4.1 Role of AU3-Win in Geomatics Education

With respect to education in photogrammetry, most developing countries lack integrated courses at academic level. Many photogrammetrists are empirically formed in the public or private organizations that have the responsibility of producing base maps because educational institutions lack the equipment and tools necessary to teach practical photogrammetry. In this context, CartoData has implemented a program for technology transfer to academia and research institutions worldwide through which the AU3-Win software is provided at minimal cost. Universities that have benefited from this programs are the University of Colima, University of Guadalajara, Panamericana University, University of Tepic, Technological Institute of Mexico, among others.

4.2 Role of AU3-Win in the Mapping Profession

Since 1999, AU3-Win has been in use in Mexico producing maps that satisfy international specifications and accuracy standards. CartoData's own facilities include forty AU3-Win workstations and staff that last year processed over 12,000 models.

Current AU3-Win users include government agencies, private companies and individual users; among them anthropologists, archeologists, biologists and architects who traditionally do not use photogrammetry.

5. FINAL REMARK

The appearance of new digital photogrammetric plotters that simplify and make map production cheaper will contribute to asses better answers to world challenges. AU3-Win is one of such contributions.

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BIOGRAPHICAL NOTES

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