Abstracts

FERNANDEZ, V. M.: *Computer applications in Spanish archaeology: a panorama of the first congress*

A general assessment of the congress is made, and the main points of each paper are emphasized.

GARDIN, J. C.: *Artificial Intelligence in archaeology: today and tomorrow*

The problems of formalization in two well-known areas of computer practice in the humanities, namely data banks and numerical taxonomy, are regarded as an anticipation of current questions in the field of expert systems. The author sees the main potential of the AI applications to archaeology in the modelling of our specific reasonings in a theory-independent way, in order to make their own limits explicit and to attain simpler writings, more scientific but also closer to the literary discourse.

BARCELÓ, J. A.: *The use of Expert Systems for the interpretation of multivariate statistical classifications*

The main features are explained of a particular expert system under way, which aims to model the relationship between mathematically defined similarities of socio-technic artefacts and the degree of social control in a past society. The practical utility of this simulation of middle range theory, which applies ethnoarchaeological control cases to define socially significant atributes and the very existence and classes of connection between artefacts and the area of social relations, lies mainly in its potential to reproduce without error inference sequences, much longer than it is possible with more traditional methods.

ESQUIVEL, J. A.; CONTRERAS, F.; MOLINA, F., y CAPEL, J.: *An application of the Information Theory to the analysis of data described by qualitative multi-state variables: similarity measures and cluster analysis*

A set of quantitative coefficients, which derive from the Information Theory and apply the concepts of entropy and uncertainty, are proposed for measuring the similarity between individuals described by nominal/ordinal multi-state variables. Following a hierarchical-agglomerative clustering algorithm, the four measures are applied to a collection of Bronze Age vessels, infering the practical advantage of the "similarity-affinity" coefficient from the better correspondence of the output dendrogram with the previous archaeological classification.

CONTRERAS, F.; MOLINA, F., y ESQUIVEL, J. A.: *A methodology proposal for the typological study of archaeological assemblages by multivariate analysis*

A general description of the statistical package implemented at the Department of Prehistory of the University of Granada. The usual types of analysis (cluster, principal components, etc.) have been appropiately adapted to the management of archaeological data, with a straight link with data bases, practically unlimited sample size, and powerful graphic output. A straightforward reference to stratigraphy and other context units is made feasible by the graphic display of the statistical results on the plotted excavation drawings.

RISQUEZ, C.; HORNOS, F.; RUIZ, A., y MOLINOS, A.: *A multivariate analysis application: a proposal for a contextual typology*

A substantial sample of pottery rim sherds (Iberian site of Puente Tablas, Jaen) is firstly described by a series of quantitative measurements (referring to horizontality, centre of gravity, thickening, and concavity) and next examined by factor and cluster analysis. A graphic display of the higher sherd densities of each rim type in the habitation units, over the factor plot, allows a functional interpretation of the different excavated rooms and yards, and it also shows the vessel morphological trends in each of them.

LORRIO, A. J.: *Automatic classification of complete pottery vessels: a comparative study of several multivariate methods*

Several multivariate taxonomic methods, with different similarity measures and clustering algorithms, are applied to a set of Iron Age vessels from the Medellin cemetery (Badajoz), with the purpose of comparing the outcome with a previous traditional classification. The average-linkage and especially the Ward algorithms are shown to be manifestly unrivalled, and simple euclidean distance seems a better measure than squared in disclosing sub-types. Next it is argued that principal components analysis is an essential complement to clustering methods, and very useful in separating types with minor shape differences (on neck and rim).

GUINEA, M., y HERAS, C. M.: *The application of correspondence analysis to archaeology: some case studies*

The advantages of correspondence analysis are shown in its application to the automatic seriation of 135 sherd assemblages from a surface survey —described only by the sherd thickness coded into discrete form—, the chronological and geographical clustering of complete surface assemblages described by presence/absence variables, and to disclose natural strata from a rubbish dump mound. All the collections are from the Esmeraldas Project, Ecuador.

FERNANDEZ, V. M., y GARCIA, M.: *The computer processing of qualitative data from cemeteries: correspondence analysis and Quinlan's ID3 algorithm*

Correspondence analysis and ID3 algorithm are applied to a large set of Meroitic graves (Abri, Sudan), described by multi-state nominal variables, which had been formerly scrutinized by a limited bi-variate analysis. The previously detected social and chronological model of the cemetery was verified in a much faster way and with a clearer display, and some additional correlations were uncovered. The rule generator ID3 algorithm did not match the advantages of the former analysis, at least in this preliminary application.

IZQUIERDO, P.: *A computer program for the analysis of archaeological cemeteries*

A Pascal program is presented for the clustering, statistical, and spatial analysis of graves, with actual results of its application to some Iberian cemeteries. Instead of the more usual concepts of "richness" or "status" of the deceased as it is displayed by the grave contents, the author introduces a coefficient of "contextual value" of each funerary item, allegedly based on a historical materialist approach, trying to measure the material appropiation of each grave. The figure is proportional to the rarity, spatial concentration, and social esteem of the cultural type.

CEREIJO, M. A.; HERRANZ, M. A., y PATON, D.: *Characterization of medieval faunal remains by multivariate analysis*

Correspondence and discriminant analysis are applied to the faunal compositions of 15 Spanish medieval sites and from several excavated parts of a single site. In the first case, the site geographical position proved to be a better discriminant than its cultural assignment. The second analysis illustrates the utility of using faunal data in the determination of distinctive functional areas within the site.

PATON, D.; ROSELLO, E., y CEREIJO, M. A.: *A computer program for the identification of fish remains*

A Basic program is presented to help in the task of identificating the different species of the *Mugilidae* family. In order to obtain the accurate solution, the user has to answer a number of questions from the program, about the presence/absence of several diagnostic features in three types of bone.

ARRIBAS, J. G.: *A computer program for absolute dating with the Thermoluminescence method*

The main features, subprograms and options are explained of a Basic program for the dating-associated calculations in the recently established Thermoluminescence laboratory of the Universidad Autónoma of Madrid.

ARROYO-BISHOP, D.: *The ArchéoData system: towards an Archaeological Information System (AIS)*

The general rules are explained of ArchéoData, a Data Base system which aims to the integration and management of every information in any archaeological project. The author's purpose is to expand the system into an AIS using some of the existing Geographical Information Systems, and with this aim, the commercial software available is described and assessed.

ARROYO-BISHOP D., y LANTADA, M. T.: *The computerization of large archaeological excavations and projects*

Some of the actual rules and codes of the ArchéoData system are presented, as well as some practical advice about how to cope with some of the many problems in computerizing an archaeological project.

GARCES, I.; JUNYENT, E.; LAFUENTE, A., y LOPEZ, J. B.: *The system for automatic record and information management at the protohistoric site of Els Vilars (Arbeca, Lleida)*

The integrated system SYSLAT, designed with Hypercard on Macintosh by Michel Py in the French site of Lattes, is illustrated in its current application to the Catalonian site of Els Vilars. The system includes an array of forms for the record of stratigraphic units and features, drawings and photographs, written documentation, ecofacts, every kind of artefact with especial emphasis on the pottery, etc. Statistical analysis such as automatic classification and relative dating by seriation techniques are also provided.

INFANTE, F., y FERNANDEZ, G.: *ABPS: the computerizing of the project on landscape archaeology (Bocelo-Furelos, A Coruña)*

A description of the already designed parts of an ongoing computer project for data management in a research of landscape archaeology, which embraces the complete collection of ecological and cultural information by surface survey in a region of Galicia. The system is written with the applications generator of dBASE-IV and has two main files, for environmental conditions and archaeological "points" (a generalization of the concept for "site", further divided into "dispersal areas"), and other files and programs for micro-spatial analysis, artefact classification, ecofact sampling, topography, graphics, and project administration.

MAESTRO, E. M., y TRAMULLAS, J.: *Mediana de Aragón: organization and analysis of pottery data with data base management systems*

A program using FoxBASE on MacIntosh has been planned for the analysis of pottery sherds in the Iron Age and Roman site of Mediana de Aragón. Reports for types, technological features, surface and decoration attributes, and general reports are available on command.

FERNANDEZ, V. M., y FERNANDEZ, G.: *The TIESTO system: a proposal for the analysis of sherds in archaeological excavations*

A system written with the applications generator of dBASE-IV is intended for the comprehensive analysis of sherds, usually recovered in huge quantities at proto-historical and historial excavations. In addition to the customary reports for any combination of fields, the program is prepared for computing statistics on the numeric fields (means, deviations, histograms), contingency tables (types/contexts) for correspondence analysis, and a series of figures to measure the diversity (richness/evenness) of the different assemblages. The ultimate goal is to infere the depositional character and the functional meaning of each context, following the principles of the 'theory of the formation of the archaeological record' by M.B. Schiffer and others.

MOLINA, F.; ESQUIVEL, J. A., y CONTRERAS, F.: *An integrated system of catalogue and analysis of the archaeological information*

A general description of the integrated system for the archaeological data storage and analysis at the Department of Prehistory of Granada. The system uses Hypermap and Windows, and it is intended to serve all the research projects at the department, integrating texts, graphics, and image processing systems.

VERDEGAL, V.; BONO, V., y FERRER, S.: *A project for computerizing the local museum of the Plana Baixa (Borriana)*

A description is made of the dBASE-III system for data storage and retrieval at the local museum of Borriana (Castellón). The data include the artefact attributes, museum location and the original contextual information from the excavations. The menus and questionnaire screens of the program are listed in an appendix.

ADANEZ, J.: *An application for the management of bibliography and associated documentary information*

A general description of the GRIOT system, a program made with the applications generator of dBASE-IV and intended for the management of bibliographical cards in a research project about spatial behaviour in archaeology and anthropology. The key words for searching include the Universal Decimal coding and also a classification of published works according to D.L. Clarke's division of system, paradigm and theory, and to Murdock's division of artefacts and ethnic groups.

MEDINA, J.: *Would it be possible a centre for the distribution of computer programs for archaeology?*

A call for the creation of a special public center to receive, store and dispense archaeology-orientated computer programs to all interested users.

ALMAGRO, A.: *A computer system of archaeological documentation at the Escuela de Estudios Arabes (CSIC) of Granada*

The former and current software and hardware for topographical and graphics processing used at the School of Arabic Studies of Granada are presented. The author vindicates the application of photogrammetric techniques connected to CAD programs, for the quick graphic display of topographical, architectural and excavation data.

MEDRANO, M.; DIAZ, M. A., y TRAMULLAS, J.: *The reconstitution of the monumental building of Contrebia Belaisca (Botorrita, Zaragoza)*

After an introduction to the history and archaeological research at the Celtiberian site of Botorrita, the mathematical reconstitution of the architectural dimensions of its monumental buiding —probably a market centre— is summarized. Several CAD programs make feasible a complete graphic reconstitution and rotated views of the building, which may be very useful for its interpretation and possible future reconstruction at the site.

WENIGER, G. C.; ESTEVEZ, J., y LINDENBECK, J.: *SANQUIN: a program for the assessment and reconstruction of archaeological strata*

A general description of a computer program for the graphic display of the spatial location of artefacts and faunal remains, applied to the excavations at the Middle Palaeolithic site of Mediona (Barcelona). The locations are not only denoted by simple points but also by the actual dimensions of the finds, and the system has proved to be very useful for the detection of post-depositional removals and the functional interpretation of activity areas.

DIAZ-ANDREU, M., y MONTERO, I.: *Systems of computer graphic display: density maps for archaeological finds*

A Basic program, connected to other programs for topographical plotting, is presented for the graphic display of surface densities of finds in a survey of Bronze Age sites in

the Cuenca province. These maps may be useful for infering activity areas inside the settlement and functional distinctions between the different sites.

GURT, J. M.; BUXEDA, J., y CARDELL, J.: *A computer application to the study of the territory in the classical times: Roman centuriations*

Several Basic programs are shown for the graphic display of the grid of a hypothetical Roman cadastre system over the present topographical map of an area of Majorca. The correspondence of the lines and corners of the grid with some of the supposedly surviving Roman features (old tracks, administrative limits, etc.) is the way that the hypothesis is assessed and the cadastre may be confirmed.

FERNANDEZ, P., y VICENT, J. M.: *A system of territorial analysis for archaeo-geographical applications*

Several Basic programs are presented for the practical quantitative and graphic application of Site Catchment Analysis. On the basis of the topographical data, the system obtains a series of isochronic lines at fixed time intervals of walk from the site, and using a cluster sampling method it calculates the percentages of land-use categories within the different territories. The program also permits the graphic representation of the exploitation territories of several sites in a wider area.

BARRIUSO, J.: *The applications of digital image processing to archaeology: some experiments with the MIP and GEOJARS systems of MICROM*

A general description of the potential practical applications of digital image processing to archaeology, in the fields of artefact chemical analysis, remote sensing surveys and image data banks. The results are shown of some applications of the commercial software developed by the Spanish company Microm.