



COMPUTER APPLICATIONS IN ARCHAEOLOGY

INTERNATIONAL CONFERENCE

DUBLIN 1999

PROGRAMME & ABSTRACTS

CONTENTS

PROGRAMME:		1
Wednesday, 14 th of April:	<i>Presentations</i>	1
Thursday, 15 th of April:	<i>Presentations</i>	3
Friday, 16 th of April:	<i>Presentations</i>	6
Saturday, 17 th of April:	<i>Presentations</i>	9
Sunday, 18 th of April:	<i>Field Trips</i>	11
Posters, Demonstrations & Book Sales		12
CONFERENCE DAY PLANNER		14
ABSTRACTS:		16
Database Applications		16
GIS Applications		22
Internet Applications		27
Management & Organisation		32
Statistics & Quantitative Methods		34
Surveying & Mapping Applications		40
Virtual Reality, Education & Presentation		49
Posters		54
Demonstrations		57

→ SATURDAY, 17TH OF APRIL

Main Theatre:

Survey and Mapping

- 09.30** **Title:** To Core is to Know
Authors: Drs. B.C. Ridderhof (Vrije Universiteit, the Netherlands) and Drs. W.F.M. Beex - (Universiteit Leiden, the Netherlands)
- 10.10** **Title:** Carrowmore Revisited – Preliminary Results of the 1994-2000 Excavation Campaign
Author: Göran Burenhult, Gotland University College, Sweden
- 10.50** Coffee
- 11.20** **Title:** An Investigation into Non-Contact Methods of Profile Acquisition for Medieval Architecture.
Authors: Gareth Bradshaw (Dept. Computer Science T.C.D.) and Rachel Moss (Dept. of History of Art, T.C.D.)
- 12.00** **Title:** An Integrated Approach to Archaeological Survey Design, Methodology and Data Management.
Author: Joe Fenwick, The Centre for Archaeological Survey, Department of Archaeology, National University of Ireland, Galway.
- 12.40** Lunch
- 14.30** CAA ANNUAL GENERAL MEETING.

Press Room:

GIS Applications

- 09.30** **Title:** The Wadi Faynan Project in Jordan.
Author: Francesco Menotti, Institute of Archaeology, Oxford.
- and*
- Title:** Describing the Geographical Background of the Archaeological Sites Presented as Point Features. An Analysis of the Effect of Different Spatial Resolutions and Software on Interpretation.
Author: Ulla Rajala, University of Cambridge
- 10.10** **Title:** GIS and its Application on Archaeological Field Surveys.
Authors: M^a Concepción Blasco, Javier Baena and Mercedes Planas: Universidad Autónoma de Madrid.
- and*
- Title:** Analysing Changes in the Settlement Pattern Around Silchester from 100 BC to AD 200.
Author: Devon Tully
- 10.50** *Coffee*
- 11:20** **Title:** To be announced...
Author: Eoin Grogan and Barry Masterson, The Discovery Programme
- 12.00** **Title:** Computer Aided System on Archaeological Materials.
Author: Juan José Fuldain González.
- 12.40** *Lunch*
- 14.30** CAA ANNUAL GENERAL MEETING IN THE MAIN THEATRE

Bedford Room:

Statistics & Quantitative Methods



- 09.30** **Title:** Patterns
Authors: Carlos Reynoso and Damián Castro, Universidad de Buenos Aires.
- 10.10** **Title:** Exploring Archaeological Data with Projection Pursuit Methods.
Authors: S. Westwood and M. J. Baxter, Dept. of Mathematics, Statistics and OR, The Nottingham Trent University, Clifton Campus.
- 10.50** *Coffee*
- 11.20** **Title:** Clustering with KDEs: Art Historical and Archaeological Applications.
Authors: C.C. Beardah*, S. Porcinai+ and M.J. Baxter* (* Department of Mathematics, Statistics and OR, Nottingham Trent University. + Istituto di Ricerca sulle Onde Elettromagnetiche "Nello Carrara," Consiglio Nazionale delle Ricerche, Florence.
- 12.00** **Title:** Adaptive Sampling in Real Life: Large Objects and Stopping Rules.
Author: Clive Orton
- 12.40** *Lunch*
- 14.30** **CAA ANNUAL GENERAL MEETING IN THE MAIN THEATRE**

decisive element in the cultural and chronological farming of these communities. Ceramics samples from the Romanian neolithic site were subject to computer analysis. The statistical analysis of pottery from Turdas revealed the ceramics manufacture, the stage of the settlement and tools.

Title: Starch Grains in Melanesia

Authors: Nick Fieller & Julie Hopkins, Department of Probability and Statistics, University of Sheffield

Format: 30 minute paper

Palynologists believe that any single plant species gives rise to only one 'type' of starch grain, but there is a suspicion that different plant species could give rise to the same grain 'type'. Current research is concerned with establishing whether grains of the same type from different species can be differentiated on the basis of grain size. So far, the methods used by archaeologists to investigate this have been rather ad-hoc and we propose using the multivariate technique of correspondence analysis and statistical modelling of size distributions to formalise them. This methodology is illustrated using starch grains from a variety of sites of known environment in Gauru, Melanesia.

→ **Title:** Patterns

Authors: Carlos Reynoso and Damián Castro, Universidad de Buenos Aires.

Format: 30 minute Paper

The project goal is to make a system capable of storing and analyzing patterns in rock art, ceramics, etc. The first module converts image data to a matrix. The second module applies the back-propagation neural algorithm to the matrix, using a set of pre-defined patterns, each one representing a pattern class.. We are programming several other algorithms for pattern recognition, to solve problems such as: how many pattern classes are there in this sample? Etc.

Title: Exploring Archaeological Data with Projection Pursuit Methods.

Authors: S. Westwood and M. J. Baxter, Dept. of Mathematics, Statistics and OR, The Nottingham Trent University, Clifton Campus.

Format: 30 minute paper.

Principal component analysis (PCA) is one of the most widely applied multivariate methods in the statistical analysis of archaeological data. Methods of projection pursuit (PP) aim, like PCA, to produce informative one- and two-dimensional displays of the data, based on linear combinations of the original data. It has been claimed that PP can produce more informative output than PCA but, because the methodology is computer intensive and not easily available to many archaeologists, it does not seem to have been used much (if at all) in archaeology. The paper will report on our experiences with PP, using as illustration lead isotope and chemical compositional data of the kind widely used in provenance studies.

Title: Clustering with KDEs: Art Historical and Archaeological Applications.

Authors: C.C. Beardah*, S. Porcinai+ and M.J. Baxter* (* Department of Mathematics, Statistics and OR, Nottingham Trent University. + Istituto di Ricerca sulle Onde Elettromagnetiche "Nello Carrara," Consiglio Nazionale delle Ricerche, Florence.

Format: 30 minute paper

At previous CAA conferences we have reported on the use of Kernel Density Estimates (KDEs) for data display in up to three dimensions. Higher dimensional data are often analysed by subjecting them to some dimension reduction technique such as principal component analysis (PCA). KDE methods can then be applied to the first one, two or three components of the PCA scores in order to identify structure.