

Digital Archaeology: Quantitative approaches, spatial statistics and socioecological modelling

FORMAT AND SESSIONS

The colloquium will consist of three main sessions dealing with the topics...

- quantitative approaches in spatial and non-spatial archaeological case studies
- data mining and new techniques of supervised and unsupervised pattern recognition in archaeological and environmental datasets
- applications and approaches to socioecological modelling on different scales and temporal resolution

INVITED SPEAKERS

Juan A. Barceló; Universitat Autònoma de Barcelona

Michael Barton; Arizona State University

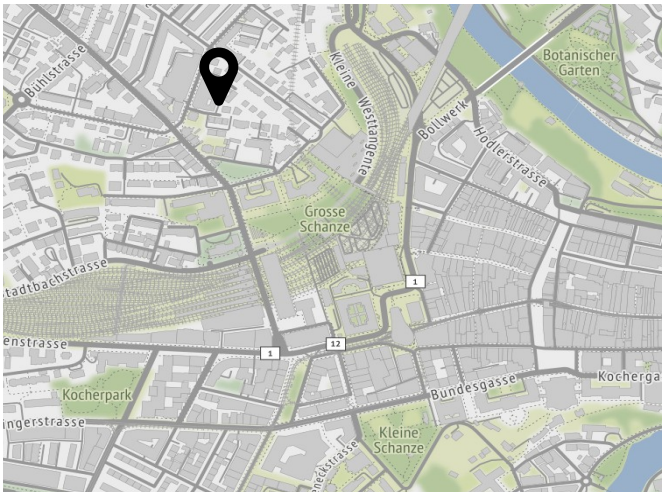
Mikhail Kanevski; University of Lausanne

Oliver Nakoinz; University of Kiel

R WORKSHOP

On the third day of the colloquium, 6th February 2019, participants will have the opportunity to join a R workshop where they will work on real archaeological data and learn the application of advanced machine learning techniques.

VENUE



University of Bern, Institute of Geography, Hallerstrasse 12,
3012 Bern

CONFERENCE REGISTRATION

Due to organisational purposes please register online if you like to participate. The fee for conference registration includes workshop registration, materials, coffee breaks, and the conference dinner.

BA and MA students are exempt from the registration fee. Online registration will be open until 18th January 2019. There will be a grant to support travel and accommodation expenses for young scientists, i.e. BA / MA / PhD students and early Postdocs, presenting a talk or poster at the colloquium.

GENERAL INFORMATION

The colloquium will take place at the University of Bern, Switzerland. For further and updated information please visit

www.oeschger.unibe.ch/dab2019

We look forward to meeting you in Bern!

Maria Elena Castiello, Julian Laabs and Martin Hinz
on behalf of the Organization Committee and the Institute of
Archaeological Sciences, Bern University

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International Colloquium on Digital Archaeology in Bern
4th – 6th February 2019, University of Bern, Switzerland

Recent advances in computer and environmental science, climate modelling and other disciplines as well as the availability and processability of (openly shared) big data have triggered fundamental changes in research over the last decades and expanded the toolbox of archaeological methods. While traditional methods (i.e. typochronology, mapping sites) remain important and continue to be used to study material culture complexes and past human societies over time and space, novel quantitative approaches based on spatial analysis, however, are rapidly gaining momentum. The archaeological community has recognized their importance to support and add value to archaeological data as their contextualisation and interpretation.

The development of highly specialized plugins and packages in open-source frameworks like R, QGIS and SAGA GIS has enabled researchers to process archaeological data using a much wider range of statistical methods, significantly advancing our ability to understand the spatio-temporal dynamics of past human societies. Tools like unsupervised classification (i.e. clustering and principal component analysis) and machine learning (i.e. regression trees and neural network), which few years ago were only available to statisticians and computer scientists, are rapidly adopted by archaeological researchers.

This workshop will provide a forum to present innovative ideas for applying quantitative approaches to better understand the dynamic of human-human and/or human-environment relationship. The aim is also to initiate a dialogue within the archaeological community on the interaction of different approaches to spatial modelling and classification techniques. This event addresses colleagues who would like to exchange their ideas for the use of these innovative tools and demonstrate their relevance for archaeological applications in research, heritage management practice, theory building and construction of narratives/models of (pre-)history.

09:00-09:15	Maria Elena Castiello, Julian Laabs, Martin Hinz Bern University	Introduction
09:15-10:00	Oliver Nakoinz Kiel University	History and perspectives of quantitative archaeology
10:00-10:30	COFFEE BREAK	
10:30-10:55	Núria Morera Noguera et al. Universitat Autònoma de Barcelona, Museu d'Arqueologia de Catalunya, IMF-CSIC, Spain	The complexity of production spaces at the Neolithic site of La Draga
10:55-11:20	Clara Filet Paris 1 University - Panthéon-Sorbonne	Rising cities and long distance interactions: Modelling spatial exchanges in La Tène Europe
11:20-11:45	Keziah Conroy, Robert Foley Cambridge University	Species range shifts in Neanderthals: a review of the available methods
11:45-12:10	Héctor Martínez-Grau et al. Basel University, Universitat Autònoma de Barcelona	Whom to ask the hour? The importance of filtering criteria and its implication in chronological models
12:10-14:00	LUNCH BREAK	
14:00-14:25	Helena Seidl da Fonseca et al. Kuratorium Pfahlbauten, Austria, Vienna University	Lakeshores and their hinterland: A landscape archaeology approach to the alpine Attersee-Mondsee region
14:25-14:50	Michael Kempf et al. Freiburg University, Strasbourg University	Modelling archaeological badlands: Settlement and landcover dynamics in the Upper Rhine Valley
14:50-15:15	Hubert Mara, Bartosz Bogacz Heidelberg University	3D-based digital analysis of tablets and sealings
15:15-15:45	COFFEE BREAK	
15:45-16:10	Martin Hinz Bern University	Unsupervised classification and automated shape recognition as tool for computer-assisted reproducible typology
16:10-16:35	Nevio Dubbini, Gabriele Gattiglia Pisa University	Automated creation of digital data, data analysis and visualisation tools from archaeological field work
16:35-17:20	Juan A. Barceló Universitat Autònoma de Barcelona	Data, big data and machine learning in archaeology
17:20-18:00	DISCUSSION	
18:00-20:00	POSTER SESSION and Aperó	

09:15-10:00	Mikhail Kanevski Lausanne University	Machine learning from geospatial data
10:00:10:30	COFFEE BREAK	
10:30-10:55	Marj Tonini Lausanne University	Environmental natural hazards susceptibility mapping using machine Learning
10:55-11:20	Maria Elena Castiello, Marj Tonini Bern University, Lausanne University	An innovative approach for risk assessment in archaeology based on machine learning. A Swiss case study
11:20-11:45	Rosa Lasaponara CNR-IRPA, Italy	Earth big data integration for knowledge, monitoring and preservation of cultural heritage
11:45-12:10	Jan Kolář et al. Czech Academy of Sciences, Brno University, Prague University	Modelling approaches to large-scale archaeological datasets as a way to reveal past socio-environmental dynamics
12:10-14:00	LUNCH BREAK	
14:00-14:25	Rachid Cheddadi et al. Montpellier University, ISEM, France	Human demography changes in Morocco and environmental imprint during the Holocene
14:25-14:50	Dafna Langgut Tel Aviv University	The use of mega pollen dataset to reveal early fruit-tree cultivation across the Mediterranean
14:50-15:15	Thomas Reitmaier, Kristin Kruse Archäologischer Dienst Graubünden, Kantonsarchäologie Zürich	Crops, cows, calories – A digital model for the carrying capacity of Bronze Age settlements in the inner Alps
15:15-15:45	COFFEE BREAK	
15:45-16:10	Tilman Baum Independent Researcher, Germany	How many, how far? Quantitative models of Neolithic land use in six wetland sites of the northern alpine forelands between 4300 and 3700 BC
16:10-16:35	Julian Laabs Bern University	Land use dynamics in Neolithic Western Switzerland
16:35-17:20	Michael Barton Arizona State University	Computational socioecological science: quantitative approaches to long-term dynamics and feedbacks in coupled human and natural systems
17:20-18:00	FINAL DISCUSSION	
19:30	CONFERENCE DINNER	