

# CAQDAS and Multi-dimensional Data Synchronization

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## MULTI-DIMENSIONAL DATA SYNCHRONIZATION

The NCeSS Research Node *DReSS* [5] is driving the development of new forms of data for qualitative social science research. It specifically focuses on the development of ‘digital records’, which combine traditional qualitative datasets with datasets generated in computational environments, and on tools that enable analysts to exploit these [1, 4]. The development of digital records has so far been based on supporting time-based data. Thus, and for example, one might synchronize video data of a number of people interacting via computers with a computational recording of their digital interactions to develop a richer view of their collaborations over time.

It is clear, however, that a great deal of qualitative data encompasses different dimensions. Photographs, diagrams, field notes, etc., do not necessarily sit comfortably on a timeline view. While generated in time it is not necessarily their temporal properties that are of primary interest but what they might have to say, for example, about the spatial character of action. A whole host of computational recordings have a multi-dimensional character as well. Thus, and for example, GPS data or cell data from mobile phones cuts across both space and time.

This workshop focuses on exploring the potential to support and exploit ‘multi-dimensional data synchronization’ – i.e., on the combination of heterogeneous data for social science analysis. It invites contributions from researchers who work with multi-dimensional data. These include, but are not limited to:

- Audio
- Video
- Photographs
- Transcriptions
- Interviews
- Field notes
- A range of computational recordings or ‘logs’, e.g.,
  - GPS
  - Mobile phone cell data
  - Screen capture recordings

- Text messages
- Email records
- Weblogs

There is no limit to the kind multi-dimensional data that participants may wish to present and discuss at the workshop. Indeed the aim is to include as broad a range of working cases as possible. Accordingly we invite the submission of short papers – up to 5 pages – describing the issues involved in either:

1. Using multi-dimensional data in social science research.
2. Developing tools to support the use of multi-dimensional data.

Papers will be reviewed by a panel of international experts and accepted papers will be published on the NCeSS website. In addition, a selection of the most provoking papers and/or technical demonstrations will be presented at the workshop to foster broad discussion and debate.

## OBJECTIVES

The primary goal of the workshop is to inform the development of the next generation of Computer Assisted Qualitative Data Analysis (CAQDAS) software [2]. The current state of the art sees the proliferation of a veritable host of bespoke software applications. These range, for example, from tools that are dedicated to the collation and analysis of interview data [3], to the synchronization and analysis of video and audio data [6], to the recording of interaction in digital environments [7]. A vast range of new tools to support qualitative research are currently under development and the field appears to be expanding exponentially.

The diversity of digital resources and resources that may be digitized is staggering. Yet development is largely characterized by specialized applications that have limited functionality. The concept and practice of multi-dimensional data synchronization (MDDS) is a unifying theme. It aims to integrate the development of the next generation of CAQDAS tools to develop software that is of general utility by enabling the synchronization of heterogeneous datasets. The aim, then, is to inform the development of general-purpose CAQDAS tools that are

capable of handling diverse datasets and are of broad appeal to the social sciences, rather than specialist applications that are of use to but a few. Thus, at a broad level the workshop not only aims to explore the potential of MDDS for the immediate development of e-Social Science but for the ongoing and longer-term development of CAQDAS.

## ORGANIZERS

**Paul Tennent** is a computer scientist currently responsible for the development of the *Digital Replay System* (DRS) in the NCESS Research Node DReSS. DRS is a software tool that enables social scientists to exploit the heterogeneous datasets contained in digital records. Paul has pioneered research in this area. His PhD work at the University of Glasgow as part of the Equator IRC saw the original development of *Replayer* [8], a software tool which blended qualitative and quantitative techniques to support social science study of mobile computing experiences. The development of *Replayer* was subsequently supported by NCESS under the Small Grants scheme. He is well placed to understand the demands that social scientists may place on multi-dimensional data synchronization and to incorporate these into the development of DRS.

**Andy Crabtree** is coordinator of the NCESS Research Node DReSS. He is a social scientist who has a strong interest in studying the social character of technology. He works closely with computer scientists and uses ethnographic study to inform the development of future and emerging technologies. He is directly responsible for driving the development of DRS to support qualitative research of human-computer interaction in mobile and location-based environments. He has published a number of articles on the potential and purchase of digital records in international journals and conferences, including *Computer Supported Cooperative Work: The Journal of Collaborative Computing, Personal and Ubiquitous Computing*, the ACM Symposium on Designing Interactive Systems, and the annual e-Social Science Conferences.

## INTENDED PARTICIPANTS

The workshop is intended to be of broad appeal, attracting qualitative researchers from diverse fields. In addition to qualitative researchers already involved in e-Social Science activities, we envisage the participation of researchers who already work with multi-dimensional datasets and who are interested in the development of software solutions that better enable their work. It is expected that the developers of CAQDAS software will also participate in the workshop.

## NUMBER OF PARTICIPANTS

To encourage a rich seam of discussion and debate the workshop will be restricted to a maximum of 30 participants. The aim of the workshop is to bring together the potential developers and users of the next generation of CAQDAS tools to shape the design of new general-purpose software tools.

## DURATION

The workshop will take place over three and a half hours. The proposed schedule is described below.

### 9.00-9.15

Introduction by the organizers, including a demonstration of the Digital Replay System and multi-dimensional data synchronization.

### 9.15-9.45

One-minute madness: quick-fire *single slide* presentations from all participants describing their interest in MDDS.

### 9.45-10.45

Three 15-minute presentations/demonstrations from selected participants, followed by general discussion.

### 10.45-11.00

Coffee Break

### 11.00-12.00

Three 15-minute presentations/demonstrations from selected participants, followed by general discussion.

### 12.00-12.30

General discussion of presentations/demonstrations to identify major themes of interest.

## EQUIPMENT

Projection equipment for connecting a computer, Internet access, and seating for up to 30 participants.

## REFERENCES

1. Digital Replay System, [www.ncess.ac.uk/research/nodes/DigitalRecord/software](http://www.ncess.ac.uk/research/nodes/DigitalRecord/software)
2. Fielding, N. and Lee, R. (1991) *Using Computers in Qualitative Research*, London: Sage.
3. Framework, *National Centre for Social Research*, [www.natcen.ac.uk/natcen/pages/hw\\_framework.htm](http://www.natcen.ac.uk/natcen/pages/hw_framework.htm)
4. French, A., Greenhalgh, C., Crabtree, A., Wright, M., Hampshire, A. and Rodden, T. (2006) "Software replay tools for time-based social science data", paper presented at the *2<sup>nd</sup> International Conference on e-Social Science*, June 28-30, Manchester: ESRC.
5. NCESS Research Node DReSS, [www.ncess.ac.uk/research/nodes/DigitalRecord/](http://www.ncess.ac.uk/research/nodes/DigitalRecord/)
6. Transana, *Madison Center for Education Research*, [www.transana.org/](http://www.transana.org/)
7. Noldus, *HCI Research*, [www.noldus.com/site/doc200502020](http://www.noldus.com/site/doc200502020)
8. Morrison, A, Tennent, P, Williamson, J and Chalmers, M, "Using location, bearing and motion data to filter video and system logs", *Proceedings of the 5<sup>th</sup> International Conference on Pervasive Computing*, pp. 109-126, Toronto, Springer.

