

## European Science Foundation Event Report

### **First NeDiMAH workshop on Space and Time in the Digital Humanities: "Place, Period, Event - Entity-based approaches to Space and Time"**

#### **Convenors (NeDiMAH Space and Time Working Group)**

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Jens Andresen, University of Aarhus, Denmark  
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Øyvind Eide, KCL/University of Oslo, Norway  
Eero Hyvönen, Aalto University, Finland  
Leif Isaksen, University of Southampton, United Kingdom  
Eetu Mäkelä, Aalto University, Finland

#### **Date**

30 November 2011

#### **Location**

Ravensbourne College  
6 Penrose Way  
Greenwich Peninsula  
London SE10 0EW  
United Kingdom

#### **Abstract**

This workshop focused on conceptual approaches to space and time, as opposed to geometric and coordinate based-methods. Such approaches have proven useful in contexts in which exact spatial location is unknown, uncertain or irrelevant, and can also prove a powerful catalyst for establishing connections between heterogeneous data (Linked Data). Topics included the creation, maintenance and application of spatial and temporal ontologies, gazetteers and other conceptual schemes. It was based around a series of sessions addressing the concepts of 'place' (spatial concepts), 'period' (temporal concepts) and 'event' (concepts intersecting space and time).

As the first of a series of workshops hosted by the NeDiMAH Space and Time Working Group, it established a firm foundation for future discussion and mapping of these crucial issues for furthering digital humanities scholarship. The identification of the current state of multi-disciplinary approaches to time and space modelling in the humanities will focus our efforts in future workshops as we attempt to move from an identified baseline towards ICT methods which are better founded and more useful for practical work in the area of cultural heritage as well as for further research.

## Scientific Content and Discussions

### **Place**

The concept of 'place' is a highly contentious topic amongst humanities and social science scholars resulting from, and leading to, widely divergent needs and understandings. To initiate the discussion and identify the extant issues around these ambiguities Place panelists were asked the broad basic question: 'What are Places?' to frame for their position papers. The papers – each with a specific area of focus –nonetheless converged around the negotiation between the physical and the abstract.

### **What are Places?**

Humphrey Southall – University of Portsmouth, United Kingdom

Southall considered the very slippery nature of what a 'place' is, demonstrating how even an apparently well-known concept, such as 'Elephant and Castle' in London, has changed slowly over time from a specific pub to a district and a tube station. Even contemporary places can be the subject of dispute and sometimes their existence denied altogether. Methods that fail to account for such 'conceptual creep' may be unsustainable over the long term. A place can appear in various ways, with several meanings and with very different data depending on the level at which is being dealt with. These differences make it difficult to work with large gazetteers, because it is not always easy to distinguish what kind of place we are talking about or even if we are talking about a place with physical existence.

### **From Places to Facts**

Franco Niccolucci – University of Florence, Italy

Niccolucci also focused on the difficulty of clearly defining places, emphasizing their fuzzy nature. The challenge is that we are not interested in places *per se* but in 'facts' – events that take place there, relationships between them, and so on. The difficulty faced is that these facts are always associated with appellations, not the places themselves, and as appellations are also fuzzy (what they describe, and over what period), it is often not clear if the uncertainty stems from the nature of place or appellation. Digital gazetteers ostensibly help to normalize the process but in doing so may introduce their own biases that are unrelated to the source data. Reflecting Southall's earlier comments, Nicolucci also pointed out the influence that time can have in a place name's variation.

### **Places of Media as Containment**

Simon Scheider – Institute for Geoinformatics, Münster, Germany

Scheider explored the ways in which this ambiguity is at early stages of being systemized through spatial but also through 'reference systems'. These are means of establishing what a symbol refers to based on formal underlying structure, rather than simple denotation.

## **Discussion**

The ensuing discussion identified a number of areas and issues for further consideration:

- \* The seeming lack, but growing interest in use cases and a user-centered methodological focus;
- \* Emerging communities of use and communities of interest;
- \* The development of linked data gazetteers;
- \* Addressing the unknown user by thinking about the social rather than locational aspect of space as place;
- \* Exploring levels of abstraction that allow for useful tools, platforms and standards that encompass a broad enough spectrum to address the fuzzier issues.

## **Period**

As time extends through only a single dimension, whereas space tends to be expressed in two or three, it is tempting to assume that it may be an easier topic to deal with. In fact, the challenges are just as great and progress has to some extent been slower, as demonstrated by the fact that there are fewer mature temporal gazetteers and less agreement on what constitutes a period (or period type). One particularly challenging aspect of time is the impossibility of 'revisiting' periods (as one might revisit a place) in order to 'groundtruth' assertions about them.

## **History in Context**

Ceri Binding – Hypermedia Research Unit, University of Glamorgan

Further reflecting comments that had been made in the first session, Binding explained why it is difficult to treat periods independently of place and space. However, ontologies such as the CIDOC CRM can allow us to model periods as timespans that are relative to one another, rather than absolute (of course all time is measured relatively to some extent, whether from the start of a reign, Christianity or the Epoch). These relative relations also permit us to undertake formal reasoning about them, such as Allen's interval algebra.

## **Representing imprecision in historical information**

Glauco Mantegari – University of Milano-Bicocca, Italy

When we speak of time in history we talk sometimes of an uncertain, vague or subjective timeline. To deal with this Mantegari gave the example of a model created by the SeCo Research Group at Aalto University, Finland that uses "fuzzy time spans" to overcome that uncertainty or vagueness. This model can be used to deal with time in history but also with places in gazetteers.

## **Use of Periods in British Museum Documentation**

Jonathan Whitson-Cloud – British Museum, United Kingdom

In the third presentation Whitson-Cloud described the very pragmatic approach taken by the British Museum. Here periods are not required to conform to strict definitions – they may be associated with regnal dates, schools of production, states, find-spots or other data. They are never used in isolation – always in the context of associated data. The data can occasionally conflict but it is accepted that such is the nature of data in very large, historic institutions. The data does not describe ‘the truth’; it’s simply the reality of what we currently know.

### **Discussion**

The discussion, held in separate groups, raised a wide range of additional issues amongst which some of the key ones were:

- \* How do we maintain a balance between the natural complexity of recording time and the need to make it tractable and straightforward for practitioners?
- \* How do we manage and operate between the different temporal scales that people work with?
- \* To what degree should we agree to use communally defined periods and when (and how) should we assert our own specialist definitions?

### **Event**

From a modelling perspective, events and chains of them, i.e., narratives, are even more complicated than places and periods. The notion of ‘event’ also has multiple meanings and interpretations in the Cultural Heritage domain. For example, there are exhibition events, historical events, and conservation events of collection objects. Events were considered an integral component of this NeDIMAH workshop because they reflect the philosophical phenomenon that binds time and space. The goal of this session was to identify the challenging research issues and differing perspectives involving the conception of events, and to stimulate discussion around ‘event’ in Digital Humanities scholarship.

## **Once Upon a Time: Space, time and event in modern storytelling**

Laura Spinsanti – Spatial Data Infrastructure Unit, Institute for Environment and Sustainability, Joint Research Centre, European Commission

This presentation positioned events not as history, but as storytelling and narrative artefacts. A story text such as “Once upon a time in a little cottage in the forest there was a little girl named Andrea...” already involves time and a place, and when we read about a dragon in the forest, interesting events occur. There are also new ways to tell stories, such as micro blogging – people write stories of their everyday lives on Twitter.

## **Deducing Event Chronology from Narrative**

Øyvind Eide – King's College London, Department of Digital Humanities/University of Oslo, Unit for Digital Documentation, Norway

Semantic technologies, when modelling spatiotemporal events, are being extended to support reasoning. Our knowledge about history is often only incomplete, fragmental and uncertain. If formal knowledge structures are available with well-defined semantics, then we are able to reduce uncertainty by computing. The talk introduced a number of possible methods for spatiotemporal reasoning, and argued that it is possible to utilize them with imprecise information such as “Place A is a mile south of Place B” for uncertainty reduction. Many of these methods are currently being applied in archaeological research, but this paper suggests that wider application across the digital humanities spectrum could be of significant value.

## **What is an event?**

Ryan Shaw – University of North Carolina at Chapel Hill, USA

Shaw is an information scientist working with a group of twentieth century historians exploring radicalism and civil rights. This research has exposed the perceptual gap between scheduled events and historical events that are more retrospectively defined. From this perspective, there are numerous ways that each story may construct the same events differently. One example that made this distinction particularly obvious is a speculative project which contrasts photos taken by tourists and by locals of the same space – in this case in San Francisco. This visualisation demonstrates that tourists tend to capture images focussing on very different subjects to those of local residents. This suggests that, from a spatiotemporal mapping perspective there are two very distinct San Franciscos, in fact thousands of them. This same concept, argues Shaw, also holds true for events – there are thousands of different Arab Springs. This idea has been lately extended through the Neighborhood project (<http://hood.theory.org/>).

## **Discussion**

The presentation initiated a round of discussions as to how we might put the methods and concepts identified to use within many of the projects represented at the workshop. Immediate reaction suggested some concrete ideas surrounding the casting of narratives onto ancient maps, important places (church, castle, coaching inns), and dangerous places. One commentator pointed out that the promise of neogeography reaffirms that we can update our sense of place over time.

## Assessment of Results

The primary objective of this first NeDIMAH workshop was to take stock of methods and the conceptual state of play with regards to entity-based and ontological methods for representing spatial and temporal concepts. Following the position papers and discussion sessions, a final wrap-up session pulled together the variety of themes that were discussed and sought to draw some provisional conclusions. In particular it asked the participants to talk about which methods and technologies now seem firmly established as 'best practice' and to identify where gaps exist – essentially to scope out the areas where future discussion needs to take place.

### Current Methods and Best Practice

It is clear that the technologies currently being utilised fall into several categories, including gazetteers and thesauri that describe specific entities such as places, periods and events; ontologies which describe relationships between them; and the analytic and visualization tools that make use of them.

Digital gazetteers appear to be at the forefront of development with several major services, including GeoNames and Pleiades, which are freely available and provide URIs for a large number of contemporary and historic places. These are supplemented to some degree by more general services such as Freebase and dbpedia. As such, previous concerns around licensing issues and a lack of stable URIs raised by earlier services such as the Getty TGN and Yahoo! WOEIDs have now been addressed. Unfortunately much less progress has been made on temporal gazetteers or thesauri of events. These are more commonly referred to using URIs from dbpedia or Freebase.

Ontologies have also seen a reasonable amount of development although much of this is specifically of a geographic nature, such as geometric and topological relations. A useful resource indexing these ontologies is available at: [http://labs.mondeca.com/dataset/lov/details/vocabularySpace\\_Space-Time.html](http://labs.mondeca.com/dataset/lov/details/vocabularySpace_Space-Time.html)

As well as those specific to space and time, it was noted that the CIDOC CRM also provides a sophisticated model for describing events (as intersection of places and times with particular actions). For the development of thesauri and gazetteers, the importance of using the SKOS ontology as a basis was highlighted.

Regarding tools, there are a number of generic parsers, including frame semantic parsers, which permit inferencing over well-structured RDF datasets. Prototype interfaces for managing and visualizing datasets have also been developed but these tend to be project specific and require strong coding skills to implement.

### Future Requirements

Despite these advances, it was generally agreed that the field is still very much underdeveloped and a great deal more work needs to be done before such approaches can become mainstream. Adoption of many of the methods and techniques identified remains sparse and the realm of very early scholarly adopters. This workshop sought to define possible steps that can increase usage

and lead to refinement and recognition necessary to move from experimental practise to accepted scholarly endeavour.

First there needs to be further consolidation of gazetteer resources, both temporal and spatial. Particular issues to focus on are: data quality (especially where they have been generated through crowd-sourcing activities or merging heterogeneous sources); alignment of gazetteers that cover different periods (ancient Rome with modern Rome, for example); Clarifying the IPR situation (which is often more liberal than people expect, but not always); and filling the wide geographic and historic lacunae that are still not represented. A number of small-scale initiatives are underway that are improving matters but there is a need for much more investment in this area.

A second issue is the need for a better ontology of 'place'. There seems to be some agreement that current ontologies are extremely geocentric and it may be that additional work is required to explore the various ways in which places are thought about and experienced. The CIDOC CRM may go some way to covering this territory, but further work should be done to establish whether it is sufficient. Ultimately this process should be extended to deal with periods and events as well. One particularly taxing question is whether places and periods can truly be described independently of one another ('London' and 'the Roman Empire' are both periods and places, for example.) It was also agreed that semantic parsers capable of inferencing over events also require much greater sophistication than is currently available.

A third proposal is to look at the intermediate territory between ontological approaches, which often use RDF-based technologies, and something closer to mainstream technologies, such as GIS, with which practitioners tend to be more familiar. Is it possible to represent places, periods and events sufficiently well using a temporal GIS or spatial database such PostGIS? A further alternative that was suggested was Gaming Engines and Virtual Worlds that attempt to simulate some of the more phenomenological aspects of space and time.

### **Future Impact on the Field**

It is of course difficult to be certain how the meeting will influence future developments within humanities disciplines, but it has identified a number of strands that will form the focus for our next workshops. The value of bridging and extending existing collaborations was manifest by how well the meeting was attended. Its collocation with the jiscGeo programme workshop and the Pelagios2 workshop encouraged participation from a wider number of attendees, from across Europe and the US, than might have been possible otherwise.

The general consensus from participants was that the day provided a very useful opportunity to focus on a topic which has historically been researched by a small number of specialists. There is hope that the meeting, which kicked off the activities of this NeDIMAH working group and the planned NeDiMAH wiki will provide a Web presence around which a wider community will grow.

## Annexes

### Annex 1: Programme

#### 9.30am - Orientation and Introductions

**Place** (Chair: Shawn Day)

10.00 : *What are Places?* – Humphrey Southall

10.20 : *From Place to Facts* – Franco Niccolucci

10.35 : *Place Reference Systems*– Simon Scheider

10.50 - 11.45 Place Panel

11.45 - 11.50 Coffee and Tea

**Period** (Chair : Jens Andresen)

11.50 - *History in Context* - Ceri Binding,

12.00 - *Representing Imprecision in Historical Temporal Information* – [Glauco Mantegari](#)

12.10 - *Use of Periods in British Museum Documentation* – [Jonathan Whitson-Cloud](#)

12.20 - 1 pm: Period Panel

1pm - 2pm Lunch Break

**Event** (Chair : Eero Hyvönen)

2.00 - *Once Upon a Time: Space, time and event in modern storytelling* – [Laura Spinsanti](#)

2.10 - *Deducing Event Chronology from Narrative* – [Oyvind Eide](#)

2.20 - *What is an Event?* – [Ryan Shaw](#)

2.30 - 3.00 Event Panel

3pm - 3.30 - Coffee and Tea

3.30 - 5:00 - **Open Forum Discussion on Space Time** (Chair: Leif Isaksen)

### Annex 2: Registered Participants.

1. Daniel Alves, Faculty of Social Sciences and Humanities, New University of Lisbon, Portugal
2. Jens Andresen, Univeristy of Aarhus, Denmark
3. Elton Barker, The Open University, United Kingdom
4. Ceri Binding, University of Glamorgan, Wales
5. Kate Byrne, University of Edinburgh, United Kingdom
6. Patricia Carbajales, Stanford University, United States
7. Shawn Day, Royal Irish Academy, Ireland
8. Alexander Dutton, Oxford University Computing Services, United Kingdom
9. Øyvind Eide, King's College London, Department of Digital Humanities/University of Oslo, Unit for Digital Documentation, Norway
10. Tom Ensom, UK Data Archive, United Kingdom
11. Elizabeth Fitzgerald, The Open University (Institute of Educational Technology), United Kingdom



12. David F. Flanders, JISC, United Kingdom
13. Richard Fry, WISERD, United Kingdom
14. Steven Gray, UCL, United Kingdom
15. Andrew Hudson-Smith, CASA, United Kingdom
16. Eero Hyvonen, Aalto University, Finland
17. Leif Isaksen, University of Southampton,
18. Neil Jakeman, Kings College Digital Humanities, United Kingdom
19. Kamie Kitmitto, Mimas, United Kingdom
20. Nick Malleon, University of Leeds, United Kingdom
21. Glauco Mantegari, University of Milano - Bicocca, Italy
22. Gregory Marler, No More Grapes, United Kingdom
23. Keith May, English Heritage, United Kingdom
24. Jan-Peter Muller, UCL Mullard Space Science Laboratory, United Kingdom
25. Andrew Newton, The University of Huddersfield, United Kingdom
26. Franco Niccolucci, University of Florence, Italy
27. Abiodun Obafemi, JISC, United Kingdom
28. Scott Orford, WISERD, Cardiff University, United Kingdom
29. Nicola Osborne, EDINA, United Kingdom
30. Sebastian Rahtz, University of Oxford, United Kingdom
31. Gethin Rees, Faculty of Divinity, University of Cambridge, United Kingdom
32. Cindy Regalado, UCL, United Kingdom
33. James Reid, EDINA, United Kingdom
34. Mia Ridge, Open University, United Kingdom
35. Simon Scheider, Institute for Geoinformatics, Münster, Germany
36. Ryan Shaw, University of North Carolina at Chapel Hill, USA
37. Luis Silveira, Faculty of Social Sciences and Humanities, New University of Lisbon, Portugal
38. Rainer Simon, AIT Austrian Institute of Technology, Austria
39. Jeanie Sinclair, University College Falmouth, United Kingdom
40. Conor Smyth, EDINA, University of Edinburgh, United Kingdom
41. Humphrey Southall, University of Portsmouth, United Kingdom
42. Laura Spinsanti, JRC - Ispra, Italy
43. Jonathan Whitson Cloud, The British Museum, United Kingdom
44. Sofia Zoitou, University of Thessaly, Greece

### **Annex 3: Digital Resources**

The workshop events were recorded for posterity and wider dissemination as a live blog, a Storify Twitter archive, and a series of video recordings:

- \* <http://geco.blogs.edina.ac.uk/2011/11/30/space-and-time-in-the-digital-humanities-workshop-hosted-by-nedimah-and-jisc-liveblog/>
- \* <http://storify.com/iridium/nedimah-space-and-time-syposium>
- \* <http://blip.tv/nedimahstwg>

## **Presentations:**

### **What are Places? – Humphrey Southall**

<http://spacetimewg.pbworks.com/w/page/48445706/Humphrey%20Southall>

### **From Places to Facts – Franco Niccolucci**

<http://spacetimewg.pbworks.com/w/page/48487841/Franco%20Niccolucci>

### **Places of Media as Containment – Simon Scheider**

<http://spacetimewg.pbworks.com/w/page/48491848/Scheider2011>

### **History in Context – Ceri Binding**

<http://spacetimewg.pbworks.com/w/page/48445943/STWG2011Binding>

### **Representing imprecision in historical information – Glauco Mantegari**

<http://spacetimewg.pbworks.com/w/page/48453258/MantegariSTWG2011>

### **Use of Periods in British Museum Documentation – Jonathan Whitson-Cloud**

<http://spacetimewg.pbworks.com/w/page/48445776/JonathanWTSG2011>

### **Once Upon a Time: Space, time and event in modern storytelling – Laura Spinsanti**

<http://spacetimewg.pbworks.com/w/page/48445737/SpinsantiSTWG2011>

### **Deducing Event Chronology from Narrative – Øyvind Eide**

<http://spacetimewg.pbworks.com/w/page/48445969/EideSTWG2011>

### **What is an event? – Ryan Shaw**

<http://spacetimewg.pbworks.com/w/page/48445934/ShawSTWG2011>