

THE CONNECTED PAST – HELSINKI

DIGITAL METHODS FOR STUDYING NETWORKS AND COMPLEXITY IN THE HUMANITIES

SEPTEMBER 12 – 15, 2023



CENTRE OF EXCELLENCE IN ANCIENT NEAR EASTERN EMPIRES
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HELSINGIN YLIOPISTO

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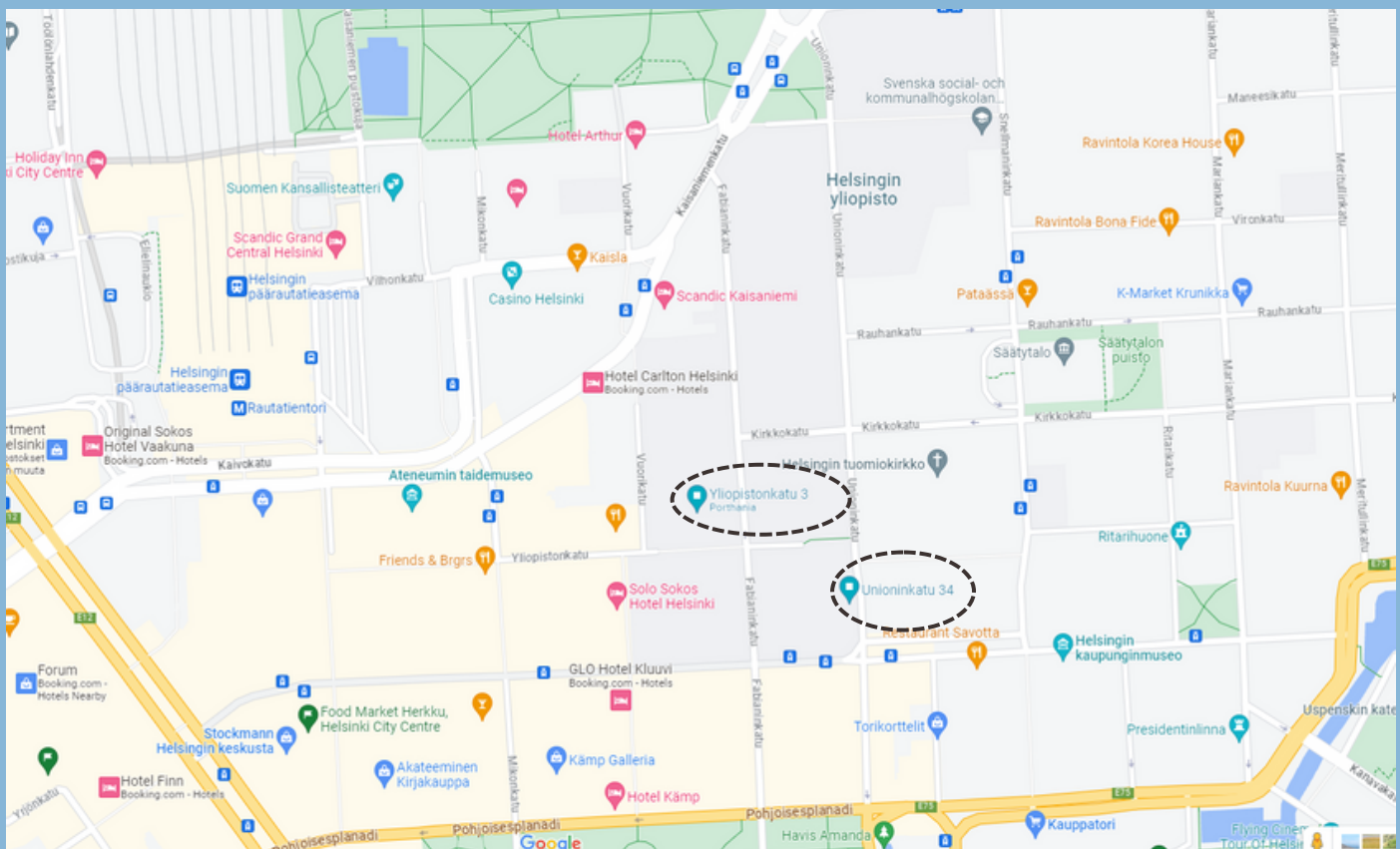
- Outside the day 1 Workshop Room Studium 1 (F3020) 3rd floor, Main Building (Unioninkatu 34).

For those **attending the talks**, you can sign in and pick up your badge here on **September 13** starting at 12:00 (noon):

- Outside the day 2 Workshop Room: Porthania (Yliopistonkatu 3) - P674 (6th floor).

A final opportunity to pick up your badge will be available on **September 14** from 8:45-9:15 outside Porthania (Yliopistonkatu 3) - Suomen Laki Hall (1st floor).

Only registered participants with badges will be allowed access to the conference.



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- **Hotel Arthur** - <https://www.hotelarthur.fi/en/> - Use code **CONNECTEDP** for a conference discount.
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- **Holiday Inn Helsinki City Centre** - <https://www.ihg.com/holidayinn/hotels/us/en/helsinki/helek/hoteldetail>
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- **Omena Hotel** - <https://www.omenahotels.com/fi/hotellit/helsinki-yrjonkatu/>
- **Hostel and Apartment Diana Park** - <https://www.dianapark.fi/>

A C C O M O D A T I O N S

AirBnB is also a popular option, as are short term rentals. Please note that these might be further away from the conference venue:

- **Töölö Towers** - <https://unihome.fi/en/properties/toolo-towers>
- **Forenom Aparthotel Helsinki** - <https://www.forenom.com/>
- **Unity Living** - <https://unity-living.com/en/locations/unity-helsinki/>
- **Noli Studios** - <https://nolistudios.com/fi>

C O N T A C T

In case of questions or issues, write to us at connectedpasthelsinki@gmail.com.

For more urgent matters, you can reach Paula Gheorghiade at +358 465580494 or Lena Tambs at +358 468970916.



W O R K S H O P

TUESDAY, SEPTEMBER 12

Location: Main Building (Unioninkatu 34) - Studium 1 (F3020) (3rd floor)

9:00 - 10:30 An introduction to network research for the study of the human past by Tom Brughmans

10:30 - 11:00 **Coffee Break**

11:00 - 12:30 Tutorial: Network analysis in Visone

12:30 - 13:30 **Lunch** (not catered)

13:30 - 14:00 Applied examples: personal experiences lectures by Fiona Coward, Lena Tambs, and Paula Gheorghide

14:00 - 15:00 Tutorial: Network data representation in R

15:00 - 15:30 **Coffee Break**

15:30 - 17:00 Tutorial: Network data analysis in R

WEDNESDAY, SEPTEMBER 13

Location: Porthania (Yliopistonkatu 3) - P674 (6th floor)

9:00 - 10:00 Network research by Tim Evans and Ray Rivers

10:00 - 12:00 Tutorial: network layout and spatial networks in R

12:00 - 13:00 **Lunch** (not catered)

CONFERENCE PROGRAM

WEDNESDAY, SEPTEMBER 13

Location: Porthania (Yliopistonkatu 3) - P674 (6th floor)

- 13:30 Welcome & Opening Remarks by ANEE Director **Saana Svärd**
- 13:40-14:00 **Giulia Belloni**
Lidar digital materiality: a critical geospatial perspective
- 14:00-14:20 **Gabriele Salciute Civiliene, Aditi Ramaswamy, and Inna Babloyan**
Data Archaeology in Times of War: A Case Study of 3D Visualizing the Wooden Tserkvas of Ukraine
- 14:20-14:40 **Tia Sager**
The Life of Buildings: 3D scanning and modelling architectural change in Late Bronze Age Crete
- 14:40-15:00 **Coffee**
- 15:00-15:20 **Mirko Surdi, Francesco Fassi, and Fausta Fiorillo**
High-resolution 3D scanning for the analysis of reed-stylus fiber impressions on cuneiform tablets
- 15:20-15:40 **Stephen Collins-Elliott**
Revisiting Babylonian Price Data: Strategies for Cointegration with Sparse Time-Indexed Observations
- 15:40-16:00 **Katrien De Graef, Kevin Hoefman, and Michel Tanret**
Codename Babylon. Applying Channel Coding Theory to Analyse the Use of Year Name Formulae in Old Babylonian Documentary Texts
- 16:00-16:20 **Coffee**

WEDNESDAY, SEPTEMBER 13 (CONT'D)

16:20-16:40 **Jennifer Dodgson**

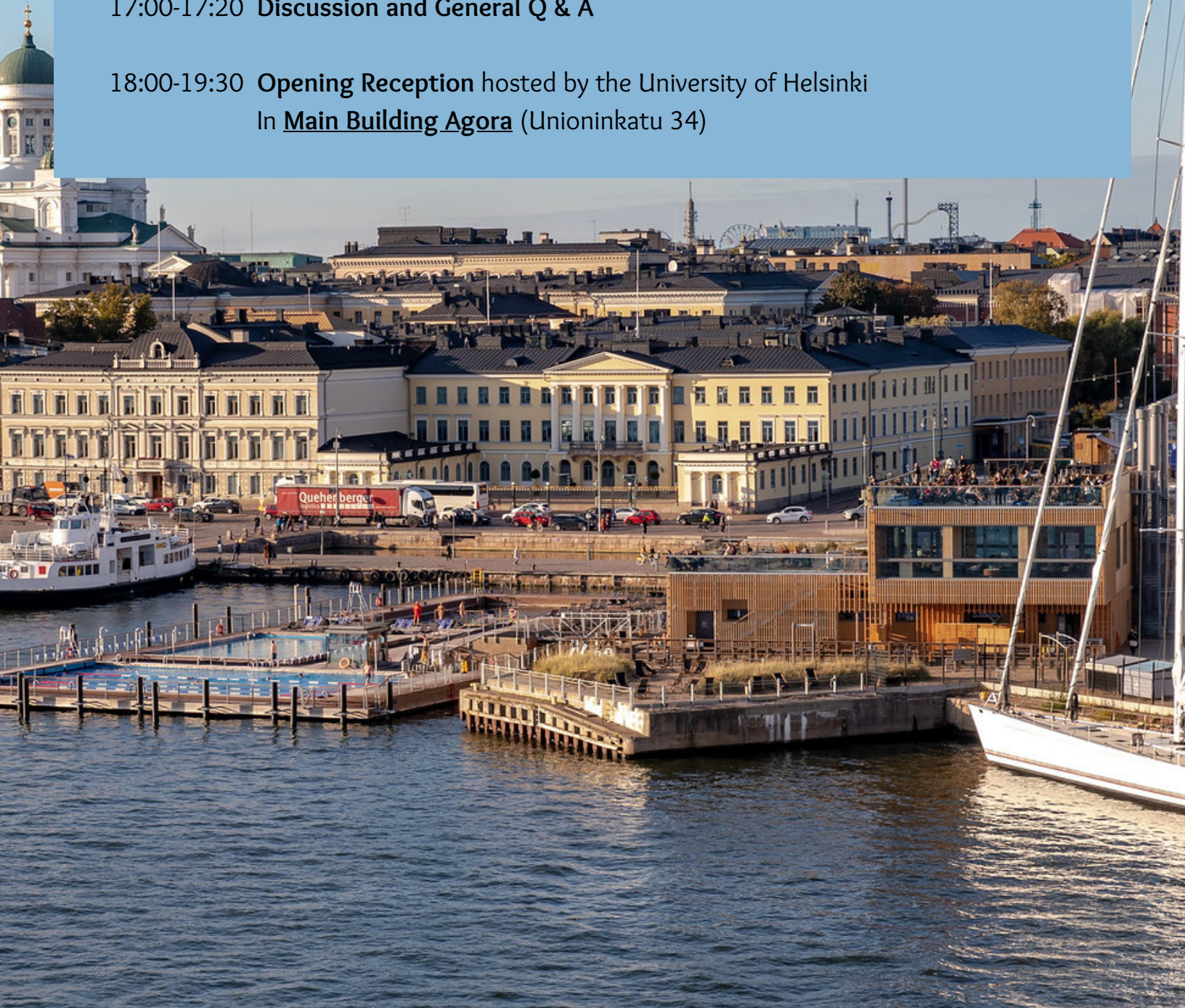
Agent-Based Models In Vivo: Blockchain-Based Experimentation

16:40-17:00 **Shelby M. Patrick**

Beyond Archaeological Invisibility: Agent-Based Modeling as a Method for Reconstructing the Viability of Perishable Trade in Inuit Nunangat

17:00-17:20 **Discussion and General Q & A**

18:00-19:30 **Opening Reception** hosted by the University of Helsinki
In Main Building Agora (Unioninkatu 34)



THURSDAY, SEPTEMBER 14

Location: Porthania (Yliopistonkatu 3) - Suomen Laki Hall (1st floor)

- 9:00-9:10 **Opening Remarks** (Conference Organizers)
- 9:10-9:30 **Ray Rivers, Henry Price, Fabrice Rossi, Vaiva Vasiliauskaite, Tim Evans, and Paula Gheorghide**
What are we measuring when we measure societal change?
- 9:30-9:50 **Raphael Schlattmann, Malte Vogl, Bernardo S. Buarque, and Aleksandra Kaye**
Individual vs System Knowledge Evolution: Information Theoretic Approaches in Socio-Epistemic Networks
- 9:50-10:10 **Dries Daems and Danai Kafetzaki**
Networks of Pots: Ceramics and Network Analysis in Mediterranean Archaeology
- 10:10-10:30 **Tim Kerig, Johanna Hilpert, and Benjamin Serbe**
A network perspective on early neolithic raw material distribution
- 10:30-10:50 **Coffee**
- 10:50-11:10 **Lana Radloff**
Networking Women: Modelling Female Maritime Mobility Networks between Crete and Miletus
- 11:10-11:30 **Lucie Salamor**
Modeling Women's networks in the Roman world: a historical renewal enabled by digital humanities
- 11:30-11:50 **Tayla Newland**
Social Network Dynamics in pre-Roman Italy: Approaching New Digital Methodologies
- 12:00-13:30 **Lunch** (catered)

THURSDAY, SEPTEMBER 14 (CONT'D)

- 13:30-13:50 **Samuel Nión-Álvarez and Maria Elena Castiello**
Tracing Roman roads in scarceful contexts. A Remote Sensing and Machine-Learning approach from NW Iberia (and beyond)
- 13:50-14:10 **Samuli Simelius**
Modelling the movement of magistrates in Roman Delos
- 14:10-14:30 **Alejandra Galmés Alba and Manuel Calvo Trias**
A connected island. Talayotic architecture and visibility networks in the island of Menorca (Balearic Islands, Spain) during the Iron Age
- 14:30-14:50 **Coffee**
- 14:50-15:10 **Camilla Mazzucato and Michele Coscia**
Constructing kinship. A network study of material and biological ties at Çatalhöyük
- 15:10-15:30 **Benjamin Serbe**
Linking through space and time. Longitudinal networks in the European Bronze Age (2200–800 BC)
- 15:30-15:50 **Discussion and General Q & A**
- 16:00-17:00 **Coffee, Mingling, and Poster Session**
- 17:10-18:00 **Keynote Lecture by Andrew Bevan**
- 18:00 **Casual Pub Night, Dinner, and Drinks**

THURSDAY, SEPTEMBER 14 (CONT'D)

POSTER SESSION

Location: Porthania (Yliopistonkatu 3) - Suomen Laki Hall (1st floor) Hallway

From 16:00 - 17:00 come meet and chat with our poster session presenters. This session will feature posters by the following authors:

EMBODIED EMOTIONS OF THE LIVER IN NEO-ASSYRIAN TEXTS USING NETWORKS AND WORD EMBEDDINGS

Eleanor Bennett

ANIMATING THE ARCHIVE: AGENT-BASED MODELLING OF HISTORICAL COMMUNICATION

Bernardo S. Buarque

Aleksandra Kaye

Raphael Schlattmann

Malte Vogl

THE SHIPPING NEWS: TRADE NETWORK, COMMUNICATION AND OBJECTSCAPE IN THE SALENTO PENINSULA

Carlo De Mitri

Paolo Marcato

DEALING WITH HISTORICAL DATA: READING "AGAINST" GOVERNMENT RECORDS

Saara Kekki

GRAIN SIZE ANALYSIS IN MUDBRICK THIN SECTIONS: AN APPLICATION OF DIGITAL IMAGE PROCESSING TO VILARES DE LA ENCARNACIÓN

Sofia Kouki

Marta Lorenzon

Benjamín Cutillas Victoria

FINDING THE NETWORKS IN THE FINDING AID

Rebecca Roach

Katherine Parsons

MEASURING DEFACEMENT OF BABYLONIAN KUDURRUS USING 3D AND 2D MODELING

Samuel Reinikainen

THURSDAY, SEPTEMBER 14 (CONT'D)

POSTER SESSION

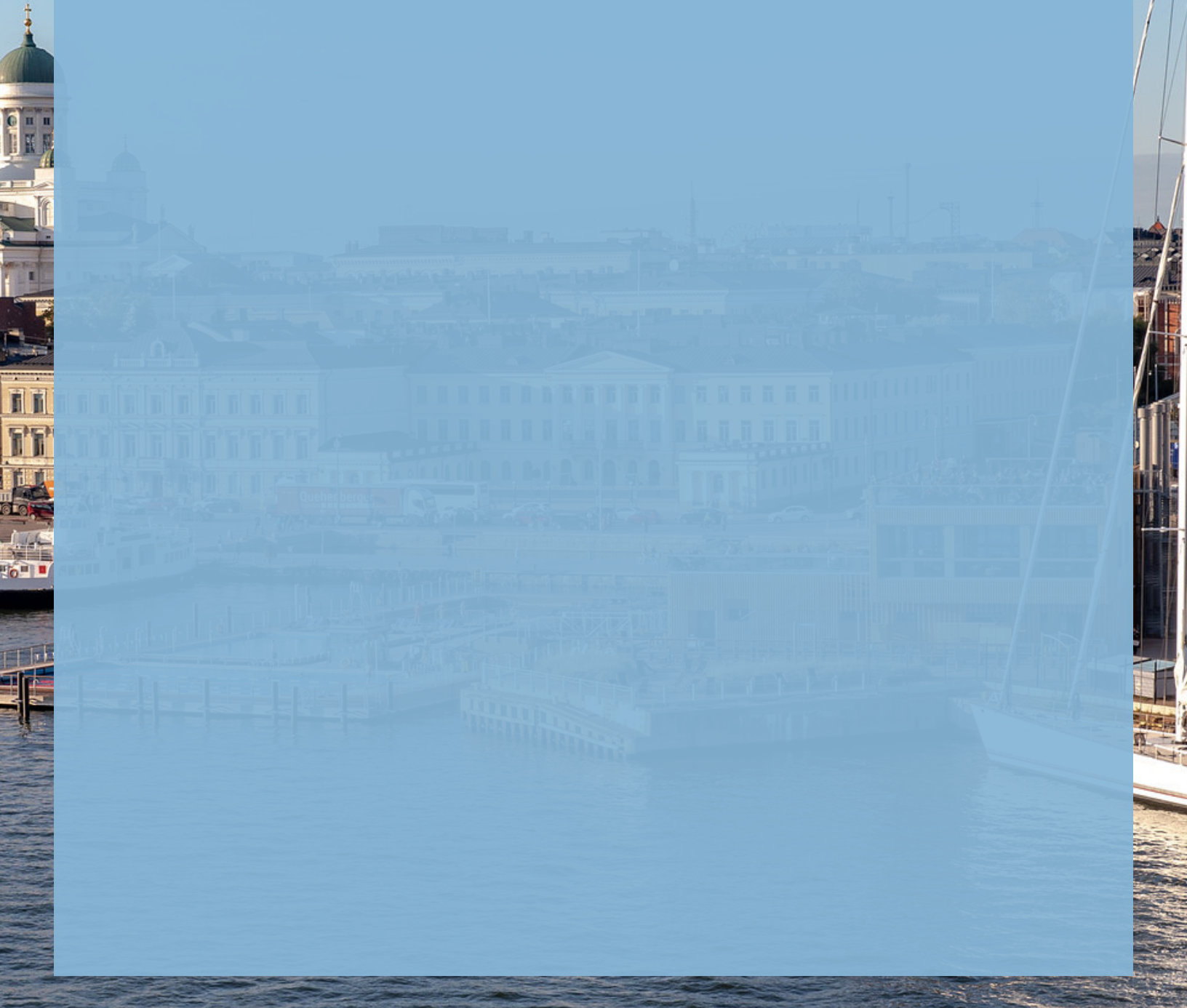
Location: Porthania (Yliopistonkatu 3) - Suomen Laki Hall (1st floor) Hallway

PICTURES TO WORD TO DATA. INTERCONNECTING THE ART OF ANCIENT MESOPOTAMIA IN DIGITAL SPACE

Elisa Rossberger

Anna Kurmangaliev

Margherita Andrea Valsecchi Gillmeister



FRIDAY, SEPTEMBER 15

Location: Porthania (Yliopistonkatu 3) - Suomen Laki Hall (1st floor)

- 9:20-9:30 **Opening Remarks** (Conference Organizers)
- 9:30-9:50 **Haleli Harel**
Semantic topographies: Creating networks of ancient, innate semantic categories with iClassifier
- 9:50-10:10 **Repekka Uotila and Jonathan Valk**
Conceptual distance: a semantic network approach to Arameans in the cuneiform sources
- 10:10-10:30 **Gustav Ryberg Smidt, Katrien De Graef, and Els Lefever**
Corpus connections and data enrichment of Old Babylonian Akkadian letters
- 10:30-10:50 **Coffee**
- 10:50-11:10 **Tero Alstola and Adrienne Spunaugle**
Positions and Roles in Nippur Networks
- 11:10-11:30 **Tetiana Shyshkina**
Leveraging Yiddish Metadata and Social Network Analysis
- 11:30-11:50 **Doren Snoek and Sarah Yardney**
Benefits of a Graph Network Model in Comparing Rewritten Texts: A Test Case from the Hebrew Bible
- 12:00-13:30 **Lunch** (catered)

FRIDAY, SEPTEMBER 15 (CONT'D)

- 13:30-13:50 **Fernanda Alvares Freire**
Exploring Social Dynamics in the Zenon Archive: a Network Analytical Study of Papyri
- 13:50-14:10 **Erika Dell'Aquila and Edoardo M. Landoni**
Contextual analysis of the transmission of Floire et Blanchefloir in XII-XV century Europe
- 14:10-14:30 **Ilona Pikkanen and the Constellations of Correspondence research group**
Millions of Connections? – 19th-century Epistolary Culture in a Wider Perspective
- 14:30-15:00 **Coffee**
- 15:00-15:20 **Kaarel Sikk, Reima Välimäki, and David Zbiral**
Exploring the Influence of Space on Heretical Interactions: A Case Study of Stettin Waldensians
- 15:20-15:40 **Noora Ahola, T. Mark Ellison, Panagiotis Kapellis, and Kaius Sinnemäki**
Evaluating the probability of diffusion: A case study of Dimli language contact with Turkish
- 15:40-16:00 **Grzegorz Myrda**
Example of GIS-centric historical data modeling based on the materials of Karol Perthées
- 16:00-16:30 **Discussion and General Q & A**
Closing Remarks
Casual Pub Night Dinner, and Drinks

I N D E X O F A U T H O R S

- Ahola, Noora (abstract under Ahola)
Alstola, Tero (abstract under Alstola)
Alvares Freire, Fernanda (abstract under Alvares Freire)
- Babloyan, Inna (abstract under Salciute Civiliene)
Belloni, Giulia (abstract under Belloni)
Bennett, Eleanor (abstract under Bennett)
Bevan, Andrew (keynote)
Buarque, Bernardo S. (abstracts under Buarque and Schlattmann)
- Calvo Trias, Manuel (abstract under Galmés Alba)
Castiello, Maria Elena (abstract under Nión-Álvarez)
Collins-Elliott, Stephen (abstract under Collins-Elliott)
Coscia, Michele (abstract under Mazzucato)
Cutillas Victoria, Benjamin (abstract under Kouki)
- Daems, Dries (abstract under Daems)
De Graef, Katrien (abstracts under De Graef and Ryberg Smidt)
De Mitri, Carlo (abstract under De Mitri)
Dell'Aquila, Erika (abstract under Dell'Aquila)
Dodgson, Jennifer (abstract under Dodgson)
- Ellison, T. Mark (abstract under Ahola)
Evans, Tim (abstract under Rivers)
- Fassi, Francesco (abstract under Surdi)
Fiorillo, Fausta (abstract under Surdi)
- Galmés Alba, Alejandra (abstract under Galmés Alba)
Gheorghiadu, Paula (abstract under Rivers)
- Harel, Haleli (abstract under Harel)
Hilpert, Johanna (abstract under Kerig)
Hoefman, Kevin (abstract under De Graef)
- Kafetzaki, Danai (abstract under Daems)
Kapellis, Panagiotis (abstract under Ahola)
Kaye, Aleksandra (abstracts under Buarque and Schlattmann)
Kekki, Saara (abstract under Kekki)
Kerig, Tim (abstract under Kerig)
Kouki, Sofia (abstract under Kouki)
Kurmangaliev, Anna (abstract under Roßberger)
- Landoni, Edoardo M. (abstract under Dell'Aquila)
Lefever, Els (abstract under Ryberg Smidt)
Lorenzon, Marta (abstract under Kouki)
- Marcato, Paolo (abstract under De Mitri)
Mazzucato, Camilla (abstract under Mazzucato)
Myrda, Grzegorz (abstract under Myrda)
- Newland, Tayla (abstract under Newland)
Nión-Álvarez, Samuel (abstract under Nión-Álvarez)
- Parsons, Katherine (abstract under Roach)
Patrick, Shelby M. (abstract under Patrick)
Pikkanen, Ilona (abstract under Pikkanen)
Price, Henry (abstract under Rivers)
- Radloff, Lana (abstract under Radloff)
Ramaswamy, Aditi (abstract under Salciute Civiliene)
Reinikainen, Samuel (abstract under Reinikainen)
Rivers, Ray (abstract under Rivers)
Roach, Rebecca (abstract under Roach)
Roßberger, Elisa (abstract under Roßberger)
Rossi, Fabrice (abstract under Rivers)
Ryberg Smidt, Gustav (abstract under Ryberg Smidt)
- Sager, Tia (abstract under Sager)
Salamor, Lucie (abstract under Salamor)
Salciute Civiliene, Gabriele (abstract under Salciute Civiliene)

I N D E X O F A U T H O R S

Schlattmann, Raphael (abstracts under Buarque and Schlattmann)

Serbe, Benjamin (abstracts under Serbe and Kerig)

Shyshkina, Tetiana (abstract under Shyshkina)

Sikk, Kaarel (abstract under Sikk)

Simelius, Samuli (abstract under Simelius)

Sinnemäki, Kaius (abstract under Ahola)

Snoek, Doren (abstract under Snoek)

Spunaugle, Adrianne (abstract under Alstola)

Surdi, Mirko (abstract under Surdi)

Tanret, Michel (abstract under De Graef)

Uotila, Repekka (abstract under Uotila)

Valk, Jonathan (abstract under Uotila)

Valsecchi Gillmeister, Margherita Andrea (abstract under Roßberger)

Vasiliauskaite, Vaiva (abstract under Rivers)

Vogl, Malte (abstracts under Buarque and Schlattmann)

Välimäki, Reima (abstract under Sikk)

Yardney, Sarah (abstract under Snoek)

Zbiral, David (abstract under Sikk)

TALK ABSTRACTS

EVALUATING THE PROBABILITY OF DIFFUSION: A CASE STUDY OF DIMLI LANGUAGE CONTACT WITH TURKISH

NOORA AHOLA (UNIVERSITY OF HELSINKI)

T. MARK ELLISON (UNIVERSITY OF COLOGNE)

PANAGIOTIS KAPELLIS (UNIVERSITY OF HELSINKI)

KAIUS SINNEMÄKI (UNIVERSITY OF HELSINKI)

Social interactions between human populations often lead to multilingualism and to increased similarity between languages. Linguists have long been interested in such contact effects, since they provide information about past contacts and networks between populations. To make inferences about these effects requires control data, typically historical data or ancestral reconstructions. Di Garbo & Napoleão de Souza (2023) propose a cost-effective method that enables large-scale comparative research of such contact effects that may, at best, approximate ancestral reconstructions. In this approach, languages are sampled in triplets: (1) the Focus language (evaluated for contact effects), (2) the Neighbour language (unrelated to Focus but identified as the potential source of influence on it), and (3) the Benchmark language (a relative of the Focus that has not been in contact with the Neighbour). The Benchmark serves as a control to disentangle contact effects from shared inheritance.

We evaluate this method by investigating a case study on Dimli (Western Iranian) contact with Turkish in Eastern Anatolia. The data come from a detailed analysis of roughly 80 features in the domain of possessive noun phrases (e.g., Nichols 1992). Possession is a suitable domain for this purpose as it often changes when culture changes (Aikhenvald 2013). We analyze data from roughly 15-20 Western Iranian languages, including Od Persian, and evaluate evidence for contact in a Bayesian way to determine to what extent even one Benchmark may provide reasonable inferences about the probability of contact effects. These analyses are compared to ancestral reconstructions produced with phylogenetic computational methods.

Initial results suggest that the probability of contact effects does not strongly depend on the chosen Benchmark language. These evaluations will be compared to the ancestral reconstructions and to geographic distance between the languages. We tentatively argue that the method may be applied to research of contact phenomena beyond linguistics.

References

Aikhenvald, A. 2013. Possession and ownership: A cross linguistic perspective. In A. Aikhenvald & R. M. W. Dixon (eds.), *Possession and Ownership: A Cross-Linguistic Typology*, 1–64. OUP.

Di Garbo, F. & R. Napoleão de Souza. 2023. A sampling technique for worldwide comparisons of contact scenarios. *Linguistic Typology*.

Nichols, J. 1992. *Linguistic Diversity in Space and Time*. Chicago: University of Chicago Press.

TALK ABSTRACTS

POSITIONS AND ROLES IN NIPPUR NETWORKS

TERO ALSTOLA (ANEE, UNIVERSITY OF HELSINKI)

ADRIANNE SPUNAUGLE (ANEE, UNIVERSITY OF HELSINKI)

Cuneiform documents from Nippur (central Iraq) shed light on the lives of Babylonian urban elites and rural populations from the eighth to fifth centuries BCE. In our project, we use network analysis to investigate the Nippurean social structures and hierarchies at large. Instead of studying the network from the viewpoint of individual actors, we aim to reach an aggregate view of global roles and positions in the network. Our data is directed and multi-relational, containing information about a person's business, family, and official ties as provided in the surviving economic and administrative documents. We use this data to create block models based on structural and regular equivalence, which we further analyze to arrive at generalizations about the roles and positions of the society represented in the network. Incorporating the sociological analysis of roles and positions to this network allows us to push beyond descriptive summaries (e.g., centrality measures) and analyze the community at a greater depth.

TALK ABSTRACTS

EXPLORING SOCIAL DYNAMICS IN THE ZENON ARCHIVE: A NETWORK ANALYTICAL STUDY OF PAPYRI

FERNANDA ALVARES FREIRE (UNIVERSITÄT ROSTOCK)

The Zenon archive is the largest surviving collection of documents dating to the Ptolemaic period, being a valuable source of insight into the social dynamics of ancient Egypt. However, the vast amount of texts in the archive poses a challenge to historians using traditional methods. To address this issue, this paper uses a social network analytical approach to explore the patterns of interaction represented in a large group of papyri from the archive. The documents include receipts, letters, petitions, and memoranda relating to managing a large rural estate in the Fayum owned by a high-ranking government official and having a man named Zenon as its manager. As a manager, he oversaw various agricultural, commercial, and local development activities, which led to his involvement with numerous individuals represented in the texts. This paper focuses on the networks of social interaction represented in these documents and aims to identify actors who occupy strategic positions in the networks. A combination of manual and automated methods was used to create a database of the material. First, the text and metadata were computationally extracted from two online papyrological databases (Trismegistos and papyri.info). Then, the social interactions alluded to in the texts were interpreted and manually added to the database, along with contextual information, and labeled according to the type of interaction. Finally, based on the analysis of the interpersonal interaction network, the study identifies actors in strategic positions according to selected network measures related to social influence, relative importance, and connectivity (betweenness centrality, eigenvector centrality, and degree). The study exemplifies how adopting computational methods can help researchers overcome the challenges of working with large and complex datasets. Additionally, it can help confirm current hypotheses and identify patterns and relationships that may not be visible using traditional methods.

TALK ABSTRACTS

LIDAR DIGITAL MATERIALITY: A CRITICAL GEOSPATIAL PERSPECTIVE

GIULIA BELLONI (OXFORD UNIVERSITY)

Lidar sensing has a history of deployment in defense, bathymetric and forestry research, several different industrial arenas, archeology, and heritage preservation. As of lately, the laser operating sensor has become a sovereign surveying modality, sustaining discourses around an envisioned shift from towards the Autonomy of Things. This sovereignty, I argue, is rooted in the black-boxing of internal algorithmic operations. Within the digitalization of the urban landscape, the emergence of experimentation around driverless cars has produced the street as a site to be automated, and thus data-mined for surveying. Unmanned vehicles have been critiqued by geographers and media scholars around questions of mobility, policies, privacy, security, and surveillance. My inquiry, instead, focuses specifically on lidar sensors generating three-dimensional representations of space and time through laser. The aim is to map the nexus of materiality and imaginary produced by such augmented maps, positioning them within what critical geographers describe as an intensification of cartographic reason, that historically pervades all mapping endeavors. Geographers have been trying to describe lidar sensing analyzing the accidents caused by the breaking down of the algorithmic management of space. Episodic recounts of breakage are momentarily productive. Still, without a clear definition of the material elements involved in the production of lidar augmented maps, studies end up confusing processes with causation, inadvertently contributing to black boxing. My approach, focusing of the inner grammar of space and time inscribed in images as the consequence of specific hardware and software architectures, points towards an understanding of the fragilities and convergences in the evolution of the sensor, demystifying confusing recounts. This form of methodological back-engineering, circumnavigates industrial secrecy and unlocks the back box, thus allowing critical inquiries and new generative applications of the technology.

TALK ABSTRACTS

REVISITING BABYLONIAN PRICE DATA: STRATEGIES FOR COINTEGRATION WITH SPARSE TIME-INDEXED OBSERVATIONS

STEPHEN COLLINS-ELLIOTT (UNIVERSITY OF TENNESSEE, KNOXVILLE)

Cointegration represents a fundamental technique for evaluating whether two or more time series are related to one another, in other words, whether they “move in sympathy.” The study of the ancient economy, whether historical or archaeological, is often concerned with such questions in a variety of domains, and here the price data from the astronomical diaries from Babylon, ca. 463-72 BCE, serve as one example (Slotsky 1997). Approaches to assessing whether the prices of commodities in the Babylonian diaries are “market prices” have involved modeling autoregressive functions with a flexible time interval, given that the price data are not attested consistently in every time index, and then performing a Durbin-Watson test (Temin 2002). The question remains whether the prices of these commodities are related to one another, changing over time but nevertheless held in an equilibrium. Cointegration testing arose out of the field econometrics to address this precise question (Engle and Granger 1987; Phillips and Ouliaris 1990; Johansen 1995) but is here hampered by several aspects of the Babylonian price data, which center on missing prices as well as the irregularity of their observation over time. This paper therefore proposes strategies for dealing with sparse observations towards performing cointegration testing. This involves first finding partitions in the dataset over time into which observations can be grouped, which can be accomplished using a nonparametric Kruskal-Wallis test as a iterative heuristic, to locate the most distinctive breaks in the mean ranks of the observations over time. By finding an optimal number of partitions, the mean price of each commodity within that partition can then be assigned to a given partition index, on the basis of which cointegration testing may then be performed.

References

- Engle, R.F., and C.W.J. Granger. 1987. “Co-Integration and Error Correction: Representation, Estimation, and Testing.” *Econometrica* 55: 251–76.
- Johansen, S. 1995. *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*. Oxford: Oxford University Press.
- Phillips, P.C.B., and S. Ouliaris. 1990. “Asymptotic Properties of Residual Based Tests for Cointegration.” *Econometrica* 58: 165–93.
- Slotsky, A.L. 1997. *The Bourse of Babylon: Market Quotations in the Astronomical Diaries of Babylonia*. Bethesda, MD: CDL Press.
- Temin, P. 2002. “Price Behavior in Ancient Babylon.” *Explorations in Economic History* 39: 46–60.

TALK ABSTRACTS

NETWORKS OF POTS: CERAMICS AND NETWORK ANALYSIS IN MEDITERRANEAN ARCHAEOLOGY

DRIES DAEMS (KU LEUVEN & VRIJE UNIVERSITEIT BRUSSEL)

DANAI KAFETZAKI (KU LEUVEN & UHASSELT)

Pottery studies constitute a core domain in archaeology. Traditional material studies often focus on the establishment of two main structuring frameworks: 1) typology; and 2) chronology, often pursued in combination as typo-chronological frameworks. The establishment of typo-chronologies forms the backbone of most chronological inferences in Mediterranean archaeology in particular. Computational approaches such as network science can help us expand the interpretative and explanatory power of these material frameworks in our understanding of the past. Network science has increasingly become mainstream in archaeology, yet, its applications in Mediterranean archaeology remain uneven and highly differential in scope and depth.

In this talk, we will present novel approaches to material culture typo-chronologies based on network science. We will explore some of the potential and limitations of network science using a number of case studies of network analysis in Mediterranean archaeology. We will sketch the outlines of a new methodological and operational pipeline in which material specialists closely collaborate with other specialists such as data scientists to develop new forms of synergy between computational methods and domain knowledge that can lift research outcomes to a higher level. The end goal of this approach is to develop a disciplinary framework where archaeological and computational approaches mutually reinforce each other through their respective strengths of rich interpretability and analytical tractability. Computational archaeology can only truly descend into the core of our discipline if it makes a serious effort to do justice to the works of material specialists. This paper aims to provide an outline for a potential path forward in this vein.

TALK ABSTRACTS

CODENAME BABYLON. APPLYING CHANNEL CODING THEORY TO ANALYSE THE USE OF YEAR NAME FORMULAE IN OLD BABYLONIAN DOCUMENTARY TEXTS.

KATRIEN DE GRAEF (GHENT UNIVERSITY)

KEVIN HOEFMAN (GHENT UNIVERSITY)

MICHEL TANRET (GHENT UNIVERSITY)

During the three thousand years of Mesopotamian history various dating systems were used, ranging from regnal years and eras to eponyms and year-names. Whereas eponyms and eras, but especially regnal years are by far the most efficient and convenient ways of data recording, this is not the case for year-names, which identify a year by a rather lengthy statement describing one or more (factual or embellished) activities of the reigning king. Due to their cumbersomeness, scribes used to abbreviate them in practice when dating documentary texts.

Although the regnal year system was known from the third millennium onwards, year-names became the official dating system in Babylonia during the Sargonic, Ur III and Old Babylonian periods, a period of about 650 years. So far, this elaborate and verbose system is considered a rather inconvenient way of dating texts and hence explained as royal propaganda, presenting the king as fulfilling the divinely ordained tasks of kingship. However, when transmitting and recording data, conciseness is not the only desirable property. We believe that the practice of year-names represents a form of channel coding, which imparts a text with a measure of robustness versus physical damage during transport and storage. By promulgating a year-name, the royal administration provided the scribal community with a “master code sentence”, from which scribes selected one or more segments to act as transmission codes. By removing superfluous information while maintaining useful redundancy, scribes were able to deduce the correct year information even if some parts of the text were damaged. Referring to the “master code sentence”, scribes were also able to decipher each other’s transmission codes. This made the year-name system a more robust dating mechanism than for example a numbering system, where even partial damage to the recorded data resulted in a total loss of information.

TALK ABSTRACTS

CONTEXTUAL ANALYSIS OF THE TRANSMISSION OF FLOIRE ET BLANCHEFLOIR IN XII - XV CENTURY EUROPE

ERIKA DELL'AQUILA (UNIVERSITÀ DEGLI STUDI DI MILANO)

EDOARDO M. LANDONI (UNIVERSITÀ DEGLI STUDI DI MILANO)

The aim of this work is to study the transmission in late medieval Europe of the text Floire et Blanchefloir (FB) through geospatial analysis and social network analysis. Geospatial analysis for the cartographical representation of the movement of the text through manuscript witnesses, social network analysis for an immediate visualisation of the manuscript context (investigation of which other texts are transmitted by the same codex as FB and with what frequency). The analysis of the corpus of texts can provide a wider context for the study of FB's geographic and temporal diffusion. The choice of FB is due to its moderate diffusion in the XII to XV century period, which will allow for an effective geographical visualisation; furthermore, the text was translated and diffused through a good number of witnesses: not so few as to make a representation of co-appearance redundant, but not so many as to make this methodological experiment too complex. The data that will be taken into consideration are: all the witnesses of FB in its European versions (excluding prints and manuscripts after this date); the place, or area (since the precise location is not always known) of production; the content of the codices containing FB in the different contexts. Through the representation on a geographical map, the network of the transmission of the text in the indicated period will be reconstructed, indicating the possible routes taken. Through social network analysis it will be possible to immediately visualise the cluster of texts transmitted with FB, in order to identify the most frequent co-appearances.

TALK ABSTRACTS

AGENT-BASED MODELS IN VIVO: BLOCKCHAIN-BASED EXPERIMENTATION

JENNIFER DODGSON (LEXIKAT)

In this paper we describe the use of blockchain games in socio-economic experimentation, based on an on-going experiment conducted by our team. In this experiment we began by distilling descriptions of the relationship between economic redistribution and political power in Warring States and Han dynasty societies into an algorithm that could be applied using a simple agent-based model constructed in Mesa. Having observed results in this model that reflected those predicted in the literature, as our designs resolved into relatively flat, unipolar hierarchies with occasional regime change, we then set out to work out whether this could then be replicated in the real world.

To do this, we wrote Solidity contracts to replicate the algorithms implemented by the agent-based models and deployed them to the Polygon network. This created a token ecosystem in which players could gain regulatory and executive power by redistributing financial resources. We then advertised the game to players as a wuxia politics simulator (<https://www.daobi.org/>) in the vein of Dynasty Warriors. As more players joined the simulation we were able to record and observe their interactions via the block explorer, thus replicating the conditions of the previous models using human agents.

Based on the data thus gathered, we found that human agents reproduced the socio-economic structures predicted by the texts faster than the agent-based models. We speculate that this is a result of the human ability to foresee and anticipate subsequent iterations of the game.

While real-world experimentation in the policy domain has long been restricted to state authorities, the development of blockchain technologies has granted researchers the ability to conduct real world experiments. In this paper we demonstrate how this can be done.

TALK ABSTRACTS

A CONNECTED ISLAND. TALAYOTIC ARCHITECTURE AND VISIBILITY NETWORKS IN THE ISLAND OF MENORCA (BALEARIC ISLANDS, SPAIN) DURING THE IRON AGE

ALEJANDRA GALMÉS ALBA (ARQUEOUIB RESEARCH GROUP, UNIVERSITY OF THE BALEARIC ISLANDS INCIPIT – CSIC)

MANUEL CALVO TRIAS (ARQUEOUIB RESEARCH GROUP, UNIVERSITY OF THE BALEARIC ISLANDS)

The landscape of Menorca (Balearic Islands, Spain) underwent rapid and drastic change during the Iron Age or Talayotic period (c. 1000-550 BC) with the construction of nearly 400 talayots, tower-like structures that gathered supra-domestic activities. The size of these architectures, up to 10m tall, as well as their location across the landscape, make them prominent features that established a new social landscape across the whole island. Although it was widely known that from the top of one talayot many other talayots can be seen, the intervisibility between sites has not been fully explored. To this end, we aim in this paper to analyse the network of intervisibility between sites, to better understand the complexity of the Menorcan Talayotic landscape.

To understand how the Talayotic architecture connected the island of Menorca, and gave meaning to the insular landscape, we analysed the intervisibility treating them as a network with connections defined by visibility. This allowed us to understand the relations that this tower-like architecture enabled across the landscape. Through sensitivity analysis comparing different heights and visual distances, we were able to investigate how the height of the talayotic architecture conditioned the visual network across the island. Moreover, through Louvain clustering we aimed to identify the different communities across the island and compare how they used communal architecture to build their own landscape, and at the same time, connect the island.

TALK ABSTRACTS

SEMANTIC TOPOGRAPHIES: CREATING NETWORKS OF ANCIENT, INNATE SEMANTIC CATEGORIES WITH ICLASSIFIER

HALELI HAREL (HEBREW UNIVERSITY OF JERUSALEM)

In this talk, I will explore how semantic structures can be modeled as complex networks. I will present the research tool iClassifier (©Goldwasser/Harel/Nikolaev), created at the ArchaeoMind Lab, Hebrew University of Jerusalem (Harel, Goldwasser, Nikolaev 2023). With this tool, corpus-based semantic networks can be created by tagging script signs representing categories (classifiers) in ancient scripts (Goldwasser 2002). The applied methodologies will be demonstrated with results based on the digitization of corpora written in various ancient scripts: ancient Egyptian, Cuneiform, Anatolian Hieroglyphs, and ancient Chinese (e.g., Harel, 2022a,b, Selz 2021). In each textual corpus, signs in the role of classifiers contain information on the intrinsic semantic assignment of lexical items into categories. Such signs are tagged, and semantic networks are plotted around classifier and lemma nodes. The results will be exemplified by a pilot study of semantic categories in ancient Egyptian narratives. Using various centrality measures the thematic scope of various texts will be presented. More so, the iClassifier research tool is an online tool and promotes collaborative research to its growing user community. Our users worldwide work together to build a corpus of examples in each respective discipline (Egyptology, Assyriology, Sinology, and Luwian). The final part of my presentation will touch upon how the results visible in classifier-based networks can contribute to contemporary discussions of lexical semantics and the modeling of semantic space in cognitive linguistics (e.g., Huth et al. 2012; Solé et al. 2010). Taking into account which lexical items are categorized in the presented networks and which are not, knowledge will be presented according to an ancient, emic, assignment of categories.

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TALK ABSTRACTS

A NETWORK PERSPECTIVE ON EARLY NEOLITHIC RAW MATERIAL DISTRIBUTION

TIM KERIG (CLUSTER OF EXCELLENCE ROOTS AT CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL)

JOHANNA HILPERT (DATENCAMPUS AT CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL)

BENJAMIN SERBE (CLUSTER OF EXCELLENCE ROOTS AT CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL)

Exchange re-produces relationships. The acquisition and exchange of raw materials thus closely interrelate with the duration, intensity and stability of certain social relationships or networks. What drove exploitation of raw material sources in prehistoric times? The most simple and straight forward answer is the basic need for these raw materials for artefact production. These mainly comprised daily tools but also included objects of symbolic value. Important examples are different flint varieties (e.g. Rijckholt, Lousberg, Szentgál, Grand Pressigny, Monti Lessini) and common metals used for daily purposes or exotic and rare materials like amber, jade, ivory, lapis lazuli, kauri, spondylus or coral. The focus of this paper is on far-reaching, interregional exchange networks of raw materials with a clearly determinable source. We present a collection of trans-Eurasian datasets (Neolithic to Bronze Age) that is being assembled within the "Exchange" projects, a collaboration between archaeology and data sciences at the Cluster of Excellence ROOTS and a data science/archaeology tandem project at the KI@CAU Datencampus.

We have developed a method for the pattern analysis of raw material distribution from a network perspective that are applicable to different time horizons and geographical areas. Using methods stemming from social network analysis (SNA), a simultaneous spatial analysis of these distribution patterns is possible. It uncovers patterns that were not discernible when looking at individual raw material distributions, analysing raw material use at regional level or from the perspective of individual sites. In the case study of the Linearbandkeramik (LBK, 5500 – 4950 BCE), the analysis points to the flow of raw materials along network structures that evolved with the initial spread of LBK to Central Europe and the subsequent development of regional groups.

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TALK ABSTRACTS

CONSTRUCTING KINSHIP. A NETWORK STUDY OF MATERIAL AND BIOLOGICAL TIES AT ÇATALHÖYÜK

CAMILLA MAZZUCATO (COPENHAGEN UNIVERSITY)

MICHELE COSCIA (IT UNIVERSITY, COPENHAGEN)

Constructing kinship. A network study of material and biological ties at Çatalhöyük. Çatalhöyük is a dense, long-lived (7100- 5950 BC) Neolithic tell site located in Central Anatolia. The site is composed of layers of overlapping mudbrick houses with no evidence for communal structures; the social arrangement of the site remains poorly understood. Previous research that made use of similarity networks highlighted a flexible and resilient social arrangement that mixes very localized ties between neighbouring buildings with cross cutting relations across far away houses. This new study integrates material culture and archaeogenomic data within a network approach and explores their complex relationship. By combining socio-material networks created using similarities of material culture across buildings and networks of biological relationships between individuals buried underneath the floor of houses, we aim to further investigate the nature of social groups and kinship structure at the site. We establish a building-building network, connecting buildings if they share a statistically significant amount of material culture, using network backboning. Then, we calculate the dispersion of kinship groups over this network via network variance.

Our preliminary findings – pending confirmation – suggest that people who share genetic ties indeed concentrate in the material culture network, or – in other words – that sharing material culture is a significant indicator that social ties are present. This is true even when we control for confounders, for instance the fact that buildings close in space and/or in time are expected to share material culture and genetic ties.

TALK ABSTRACTS

EXAMPLE OF GIS-CENTRIC HISTORICAL DATA MODELING BASED ON THE MATERIALS OF KAROL PERTHÉES

GRZEGORZ MYRDA (THE TADEUSZ MANTEUFFEL INSTITUTE OF HISTORY, POLISH ACADEMY OF SCIENCES)

There is a lot of information hidden in images of various source materials from ancient times. Revealing this information simply by transliteration alone is often not enough for later semantic analysis. Describing elements of images with complex information and creating a database from them can make such exploration easier. However, it can be a challenging process, especially if we want to preserve the connection between the semantic information and its provenance (location on the image). Furthermore, it is important to have the possibility to reconcile that information with data from other databases. As part of the work carried out at the Institute of History of the Polish Academy of Sciences, methods and tools were developed to improve the work on facsimiles of historical sources (manuscripts, maps, schemes), mainly using GIS technologies and operating in accordance with OGC standards. As a result, work progresses faster, is less costly, and it is easier to achieve a synergy effect between projects by repeatedly using the same base data or enriching them by adding subsequent information layers. The same family of tools is also used to publish the results of the work. Karol Perthées' materials from the late 18th century – maps of palatinates and the parish sketches used for their elaboration – are used as a case study to present the idea behind this GIS-centric data modeling. In connection with the appropriate ontology built for this purpose, we obtain homogeneous and comprehensive tools for recording, analyzing, and publishing changes in settlements occurring in time and space over hundreds of years of history, covering the territories of former and present Poland.

TALK ABSTRACTS

SOCIAL NETWORK DYNAMICS IN PRE-ROMAN ITALY: APPROACHING NEW DIGITAL METHODOLOGIES

TAYLA NEWLAND (THE UNIVERSITY OF MELBOURNE)

In the context of ancient southern Italy, the study of burial goods has been coloured by long-held assumptions drawn from the Classical archaeological tradition. From trade and exchange to mobility and migration, the Greek and Italic communities of the region have been subject to an outdated interpretive framework that not only limits our understanding of their identities, but also obscures the connections between them. In the same vein, social interaction amongst these groups has largely been viewed through a Hellenised lens, and while network research has proliferated in recent years, south Italian archaeological data has seldom been subject to contemporary digital analysis methods.

The following paper brings the study of Italian connectivity up to date through a systematic network analysis of mortuary data, spanning from 700-300 BC. Drawing together agent-based modelling and spatial data, it seeks to identify networks between a diverse range of artefacts and burial sites, distributed from Campania in the west to Puglia in the east. It also explores the application of the R programming language for social network analysis and visualisation, utilising a novel methodology to locate connections at various regional and interpersonal scales. While this research will shed light on social exchange across the ancient Italian peninsula, the broader project seeks to reconcile the social, geographic and agent-based factors that drove cross-cultural interaction in the ancient world. This paper, then, has the potential to contribute to the development of network analysis techniques in the broader archaeological discipline, and to enliven the current digital landscape.

TALK ABSTRACTS

TRACING ROMAN ROADS IN SCARCEFUL CONTEXTS. A REMOTE SENSING AND MACHINE-LEARNING APPROACH FROM NW IBERIA (AND BEYOND)

SAMUEL NIÓN-ÁLVAREZ (UNIVERSITY OF SANTIAGO DE COMPOSTELA/INCIPIT – CSIC)

MARIA ELENA CASTIELLO (INSTITUTE OF ARCHAEOLOGICAL SCIENCES, UNIVERSITY OF BERN, SWITZERLAND/ INCIPIT-CSIC)

Roman roads have usually been a common subject in mobility and connectivity studies. However, some peripheral regions across the Roman Empire have been overlooked due to several environmental, archaeological or conservation issues. This has limited our knowledge on how the territory was structured in outer areas with low demographic density and reduced commercial dynamism.

Aiming to face these contexts, the following work presents an approach that combines Remote sensing and archaeological survey data, to help identifying and reconstruct the tracks of ancient Roman road networks. Starting with a more “traditional” GIS approach, several locational markers were combined with the main features of the Roman roads (geomorphological and stratigraphic evidence) derived from the Light Detection and Ranging (LIDAR) images. These, as input data, were further integrated in a machine-learning based model to automate the process of feature finding and to highlight several probability levels of rediscovering ancient pathways.

These techniques were applied in the mostly forested case study of NW Iberia, although data from other regions were also gathered and used to provide more robust and insightful input datasets. The results obtained confirmed that remote sensing combined with machine learning provides an effective way to expand investigation areas and detect new traits of the Roman roads, in area scarcely surveyed and covered by vegetation, with an unprecedented level of detail. Furthermore, considering the predefined patterns of Roman roads construction techniques, the methods developed here may be of a broad application across several regions of the Roman Empire confronted with similar problematics.

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TALK ABSTRACTS

BEYOND ARCHAEOLOGICAL INVISIBILITY: AGENT-BASED MODELING AS A METHOD FOR RECONSTRUCTING THE VIABILITY OF PERISHABLE TRADE IN INUIT NUNANGAT

SHELBY M. PATRICK (UNIVERSITY OF TORONTO)

As the Little Ice Age progressed in Inuit Nunangat (Canadian Arctic), early Inuit communities in the Central Arctic Archipelago (CAA) faced a dilemma as access to their main resource, bowhead whales, shrank due the decreased temperatures and increased sea ice coverage. When confronted with decreased resource availability, communities have a few options: increase acquisition of lower-ranked resources, acquire goods from other communities via trade, or migrate to a more productive area (1, 2, 4, 6). Communities in the CAA eventually did migrate south and establish new settlements, but would bulk trade of perishable goods such as seal meat and oil have been a viable solution, if only in the interim before a migration? Researchers (e.g., 3, 5) believe that some degree of perishable goods trading was occurring, but reconstructing these relationships is challenging because the goods' organic nature means they do not survive in the archaeological record.

This research seeks to explore the use of agent-based modeling as a method for reconstructing the viability of trade networks of perishable goods between communities in the CAA and other regions of Inuit Nunangat. While communities stand to gain from long-distance trade of bulk items, this endeavor also has significant costs. By simulating the environmental, social, and resource conditions in the CAA at the time, agent-based modeling allows us to see how these factors influence a community's decision-making regarding adaptive strategies and can allow us a more fulsome understanding of what conditions may prompt CAA communities to engage in long-distance trade over other adaptive strategies. Ultimately, while trade of perishable goods cannot be seen in the archaeological record, an agent-based model provides an opportunity to determine its likelihood and thus fill a gap in the knowledge of early Inuit trade and adaptation to the Little Ice Age.

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TALK ABSTRACTS

MILLIONS OF CONNECTIONS? – 19TH-CENTURY EPISTOLARY CULTURE IN A WIDER PERSPECTIVE

ILONA PIKKANEN

THE CONSTELLATIONS OF CORRESPONDENCE RESEARCH GROUP

In this presentation, we will discuss the new perspectives on 19th-century epistolary networks in the Grand Duchy of Finland (1808/09–1917) that are provided by the digital humanities research consortium Constellations of Correspondence (CoCo; funded by the Academy of Finland 2021–2025). The project aggregates, harmonizes, and publishes 19th-century letter catalogue metadata from a wide variety of Finnish cultural heritage organizations (archives, museums and libraries) as a single reconciled Linked Open Data (LOD) service and a semantic portal with data analytical tools for researchers.

CoCo's approach is different from traditional epistolary projects such as the Republic of Letters, as it deals with a wider range of epistolary data, including those that have not been previously curated or intensively studied by researchers. CoCo casts a wider net, and aims at approaching 19th-century epistolary culture from bottom-up, in order to create a more inclusive, post-digital metadata archive of approximately one million metadata units. This means for example that women's epistolary agency is much more prominent than in the other projects that apply different scholarly filters on their materials. However, this also means that we need to accept certain delimitations regarding the quality of the data. Compared to other European epistolary projects, what kind of specific problems do we need to address in the data transformation pipeline? How does this affect the analytical tools, and the actual analyses? Network analysis has been applied to smaller, more focused epistolary collections with excellent results, for example in Ahnert & Ahnert 2019 and Ryan & Ahnert 2021. Can these tools be applied to such an extensive metadata archive as well?

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TALK ABSTRACTS

NETWORKING WOMEN: MODELLING FEMALE MARITIME MOBILITY NETWORKS BETWEEN CRETE AND MILETUS

LANA RADLOFF (BISHOP'S UNIVERSITY / AMERICAN SCHOOL OF CLASSICAL STUDIES AT ATHENS)

While scholarship on ancient seafaring and maritime networks has grown substantially since the new millennium, the role of women in the creation and maintenance of these networks remains underexplored. Women were important contributors to the domestic economy and key agents of religion, nested within overlapping and multiscalar Mediterranean-wide networks. They were also, as commodities themselves, part and parcel of forced mobility through armed conflict and marriage and motherhood. In the following paper, I reconstruct the demographics of women from two mass migrations of Cretans to Miletus in the mid-3rd century BCE. The citizenship decrees (Milet 1.3, 34 and 38) list at least 255 men, some of whom were accompanied by their wives, children, and extended families, for an estimated total of 3,000-4,000 people (Launey 1949/50). Although the texts are fragmentary, there are 102 complete or partial names and titles that can be identified as female, whose terminology allows distinctions in marital and motherhood status, family composition, and the number, age, and gender of children, as well as the strategies that women employed as they voyaged from Crete to Miletus.

Observations from the data are placed within the environmental, technical, and religious aspects of seafaring during the Hellenistic period to estimate the number and type of ships and model the sea route and the conditions that women experienced in maritime contexts. Women's labor was essential to ensuring a successful seafaring venture of the *oikos* and operated alongside men, as they travelled long distances in search of income and economic gain. My analysis centers women as active agents within academic discourse and maritime mobility networks, by highlighting the visual and sensorial aspects of women's lived experiences on the sea, allowing for a deeper understanding of the role of women, the resilience of women, and forgotten women in history.

TALK ABSTRACTS

WHAT ARE WE MEASURING WHEN WE MEASURE SOCIETAL CHANGE?

RAY RIVERS (PHYSICS DEPT. AND CENTRE FOR COMPLEXITY SCIENCE, IMPERIAL COLLEGE LONDON)

HENRY PRICE (PHYSICS DEPT. AND CENTRE FOR COMPLEXITY SCIENCE (CCS), IMPERIAL COLLEGE LONDON)

FABRICE ROSSI (CEREMADE, UNIVERSITÉ PARIS DAUPHINE – PSL, PARIS)

VAIVA VASILIAUSKAITE (COMPUTATIONAL SOCIAL SCIENCE (COSS), ETH ZÜRICH)

TIM EVANS (PHYSICS DEPT. AND CENTRE FOR COMPLEXITY SCIENCE, IMPERIAL COLLEGE LONDON)

PAULA GHEORGHIADE (ANEE, UNIVERSITY OF HELSINKI)

In prehistory, artefact assemblages provide one of the main means for understanding society. Our interest here is in characterising societal change, both spatially and temporally, through the proxy of assemblage change. At the very least, understanding change requires a categorisation scheme for identifying artefacts. In describing artefacts, it becomes clear that even the simplest inhabit a corner of a highly dimensional artefact-space (e.g. Late Bronze Age (LBA) Cretan pottery displays 30 different handle types). There are several ways to proceed:

1. At one extreme, to construct a Linnaean-style classification. That is, invoke archaeologists' 'expert' opinion to dimensionally reduce artefact-space to a universal lexicon as you might see on the display card in a museum? Even this, however, is of higher dimension than many datasets can populate in a statistically robust way.
2. At the other extreme, to use unsupervised contextual machine-learning classifications e.g. a convolutional neural network (CNN) with a greater attention to detail than any archaeologist could encompass but with 'black-box' conclusions that may not be easily explicable.
3. A supervised contextual hybrid, that augments expert opinion with information-theoretic ideas to create new classifications, in spirit but not detail, to German komposita? This reduces the 'expert'-dimensions to something more statistically robust.

We shall pursue the hybrid path in this talk, taking ideas from decision trees and optimal transport theory. It is sufficient to highlight general issues with contextual classification, one of which (applicable to all three options) is that most assemblages are themselves aggregates of sub-assemblages e.g. an assemblage at a deposition site will comprise sub-assemblages of different provenance. There is a separate statistical issue as to whether we see the assemblages as censuses or samples. In this analysis we have been motivated by the LBA Cretan dataset of Paula Gheorghiaide.

TALK ABSTRACTS

CORPUS CONNECTIONS AND DATA ENRICHMENT OF OLD BABYLONIAN AKKADIAN LETTERS

GUSTAV RYBERG SMIDT (GHENT UNIVERSITY)

KATRIEN DE GRAEF (GHENT UNIVERSITY)

ELS LEFEVER (GHENT UNIVERSITY)

As part of the interdisciplinary CUNE-IIIIF-ORM project Assyriologists and computational linguists from Ghent University (UGent) will explore new digital approaches to study, publish and enrich corpora of cuneiform texts within the International Image Interoperability Framework. For this purpose, we have set up a pilot study to analyse the language used in Old Babylonian (OB) letters using Natural Language Processing (NLP) techniques. OB letters are particularly suited as a dataset because (1) they form an invaluable source for everyday vernacular, and (2) the corpus is rather large and varied.

We chose 121 letters from OB Sippar that we lemmatized and supplemented with grammatical annotation. They are the platform for developing machine learning approaches to perform semi-automatic text analysis of OB letters that can go from transliteration to grammatical annotation (including Part-of-Speech, lemma and morphological information). The result of this step can enlarge and enrich our corpus so that we can apply other language models, namely (1) automatic term extraction to detect the main keywords of the letters and (2) distributional semantic analysis to cluster semantically related terms in the letters. These research steps will allow us to answer questions about the everyday language used in OB letters and about Akkadian in general. In this talk, we will present our newest results of our NLP progress. These results will showcase the functionality of machine learning models and how they help us answering sociocultural linguistic questions about the everyday language used in OB letters. Furthermore, we will show how our work in the CUNE-IIIIF-ORM project can help researchers connect our corpus with texts from collections around the world.

TALK ABSTRACTS

THE LIFE OF BUILDINGS: 3D SCANNING AND MODELLING ARCHITECTURAL CHANGE IN LATE BRONZE AGE CRETE

TIA SAGER (UNIVERSITY OF TORONTO)

The built environment is arguably one of the most complex forms of material evidence that archaeologists encounter in the field. It is affected by numerous processes- economic, cultural, political, environmental- all of which complicate not only our understanding of architectural phases and configuration, but also the original function and appearance of ancient structures. In addition, the archaeological site is often subject to devastating environmental processes over time, involving natural overgrowth, water damage, erosion, natural disasters, and human interference. Therefore, our understanding and preservation of the archaeological site begins on the field and requires both hands-on and digital consolidation methods. One of the most promising digital methods for the conservation and study of architectural remains is 3D scanning by means of LiDAR technology.

3D LiDAR scanning is becoming more ubiquitous and accessible because of tools such as the iPad Pro and iPhone with built-in LiDAR technology. Despite its relative ease of access, this type of 3D LiDAR scanning is not yet commonly used in the Aegean, though it has great potential for both historians and archaeologists alike. Through an architectural case study from Late Bronze Age Crete (ca. 1450-1200 BCE), this paper proposes to demonstrate the potential of integrating 3D LiDAR scanning with 3D modelling for scholarly inquiry and architectural analysis. It will be argued that in certain cases 3D LiDAR scanning by means of the iPad/iPhone can be better suited to capturing the built environment than drone photogrammetry. In addition, the integration of 3D scanning and 3D modelling will be discussed, an approach which allows for archaeologists to ask new types of architectural questions and to glean new perspectives on existing built environments. By demonstrating the process of creating active 3D models based on 3D LiDAR scans from start to finish, the goal of this paper is to engage with the potential of active multi-phase architectural 3D models as a supplement to the static single-phase architectural plans that have been prevalent in architectural studies of the Aegean Bronze Age.

TALK ABSTRACTS

MODELING WOMEN'S NETWORKS IN THE ROMAN WORLD: A HISTORICAL RENEWAL ENABLED BY DIGITAL HUMANITIES

LUCIE SALAMOR (UNIVERSITY OF LILLE, FRANCE, UMR 8164 – HALMA)

« Mamaea, his mother, would not allow him to taste any food or drink sent by the emperor. The boy did not make use of cooks and cupbearers who were in general employment in the palace – only men selected by Mamaea and approved for their complete loyalty. » Here Herodian underlines Julia Mamaea's leading role in choosing those who can interact with her son Severus Alexander and how she organizes these interactions. In the political and military conflictual context between 221 and 222 AD, which opposed the emperor Elagabalus and Severus Alexander, his mother mobilizes and expands her own network to reorganize the relationships within the Roman Imperial Court.

Network studies have been used and developed during the last 20 years in medieval, modern and contemporary history while missing from ancient roman history. Yet, as sociological studies have shown, networks approach reveals a more complex hierarchical organization in social groups than previously thought. Exploring networks brings out new kinds of roles, such as intermediaries, whose functions are invisible in a static perspective. The recent development of digital tools applied to the humanities, such as networks visualization softwares, has allowed new research prospects which have permitted a historiographical renewal concerning women's agency in ancient Rome. The purpose of this paper is to illustrate how the use of digital tools offers a new look at social practices and the role of women in the Roman World. Network modelling allows us to determine different ways of making connections: individual or collective, situational or structural. After explaining the research methodology which links network analysis and gender studies, we will present the global analysis of women's networks in the Roman World during the 1st century AD. Through the sources mentioning women's interactions within the corpus of ancient Roman and Greek historians, we will study the shape and the organization of women's networks created with the open-source software GEPHI.

TALK ABSTRACTS

DATA ARCHAEOLOGY IN TIMES OF WAR: A CASE STUDY OF 3D VISUALIZING THE WOODEN TSERKVAS OF UKRAINE

GABRIELE SALCIUTE CIVILIENE (KING'S COLLEGE LONDON)

ADITI RAMASWAMY (KING'S COLLEGE LONDON)

INNA BABLOYAN (NATIONAL GALLERY OF PRAGUE)

Digital preservation based on the classical photogrammetry or laser-scanning models of cultural heritage visualization has made huge advances in the past decade. The applications of these techniques are however limited in the face of geo-political, economic, and ecological challenges which create data gaps as when working with landmarks in warzones and other contexts where material objects and data about them are out of reach, in danger, or simply unavailable. Such is the case of Ukraine which is home to the largest number of wooden tserkvas (churches) in the world. Their material and digital safeguarding, including 3D restoration, has been problematic due to a combination of diverse factors, including the susceptibility of wooden material to climate effects, the damage caused by the current war, and the cultural and political legacy of Soviet colonialism. Launched in response to Russia's war against Ukraine, the MUSWAH (Mapping Ukrainian Sacral Wooden Architectural Heritage) project set out to inventory data about wooden tserkvas against the official lists compiled in the Soviet period and build an image database. While dealing with sparse and diachronically hybrid image data collected from various sources, including social media and archives, the project calls for rethinking how data science, digital technologies, and the humanities might be brought together to address those data gaps in cultural heritage visualization.

Based on insights into the data inventorying of tserkvas akin to data archaeology, our presentation will outline the project's experimental strand at the intersection of VR and AI. It will draw on early exploratory work with methodologies alternative to the classical photogrammetry, such as the applications of NeRFs (Neural Radiance Fields) by using colour and camera angle information as well as image diffusion and general adversarial networks for the reconstruction of smaller details in models for which textual descriptions are available instead of image data.

TALK ABSTRACTS

INDIVIDUAL VS SYSTEM KNOWLEDGE EVOLUTION: INFORMATION THEORETIC APPROACHES IN SOCIO-EPISTEMIC NETWORKS

RAPHAEL SCHLATTMANN (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE)

MALTE VOGL (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE)

BERNARDO S. BUARQUE (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE)

ALEKSANDRA KAYE (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE)

The ModelSEN project aims to model the evolution and development of knowledge systems via an integrated network theoretic approach consisting of three layers of so-called socio-epistemic networks: the social layer, the semiotic or material layer, and the semantic layer. The primary input for these layers, particularly for recent periods in the history of science, usually consists of (semi-)unstructured texts such as scientific publications, but also letter data and publications of other provenance, which are then used to construct the respective networks. To examine the diachronic development of these networks and specifically analyse (language-based) change on the semantic layer, we are working on employing information theoretic approaches based on relative entropy and other divergence measures to detect change, assess its relevance, and identify the features which contribute most to this change. One application of this approach is to investigate the relationship between the development of individual scholars' or research groups' written works and the development of the disciplinary fields in which they work. As a case study, we explore the connection between the works of physicist Hans-Jürgen Treder – a prominent physicist from the GDR – and the field of General Relativity and Gravitation (GRG) research. GRG as a field began to form and gain traction only after World War II, following a thirty-year period of stagnation in general relativity research. This revival of interest, termed the "Renaissance of General Relativity," overlaps with Treder's most productive years. We explore this concurrent development from 1945-2000 compare it to other individuals during the same period and discuss problems, limitations, and other possible applications.

TALK ABSTRACTS

LINKING THROUGH SPACE AND TIME. LONGITUDINAL NETWORKS IN THE EUROPEAN BRONZE AGE (2200–800 BC)

BENJAMIN SERBE (ROOTS CLUSTER OF EXCELLENCE AT CHRISTIAN-ALBRECHTS-UNIVERSITÄT ZU KIEL)

Time encoded data is used by archaeologists on a daily basis e.g. in the form of stratigraphy, typology or scientific dating methods. In archaeological network science time encoded data is mostly used for the development of networks in specific time periods but this common approach limits the network to its designated time frame. Longitudinal analyses aim to overcome this limitation by comparing successive networks and their properties showing the evolution of nodes through a defined time span. But those analyses are still bound to an artificial division of time.

In this paper I want to discuss the linking of amber networks through different time frames during the European Bronze Age (2200–800 BC). Two small case studies of amber artifacts from the Carpathian Basin and the Aegean illustrate the development of both regions in terms of interconnectivity. Linking nodes through time show the influence each node has inside its time frame and to its predecessors and successors in each region.

TALK ABSTRACTS

LEVERAGING YIDDISH METADATA AND SOCIAL NETWORK ANALYSIS

TETIANA SHYSHKINA (JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN)

The digital era has brought forth an abundance of resources for historical research. This study showcases the potential of leveraging metadata from Yiddish databases, such as the National Library of Israel's Index of Yiddish Periodicals (IYP), combined with Social Network Analysis (SNA), to identify and analyze the most influential author collaborations within the Yiddish-speaking community under the Soviet regime over time. The primary focus is on the Soviet Yiddish newspaper Eynikayt, a crucial Yiddish language publication that promoted Soviet propaganda in the 1940s. The process of gleaning valuable metadata, including authors, dates, and issue details, from the IYP and other pertinent sources, is demonstrated, highlighting the challenges and opportunities posed by the digitization of these resources. By utilizing the Python programming language, a co-authorship network of Eynikayt contributors is constructed, offering an extensive visualization of intellectual interactions and relationships among its writers based on the available metadata. The analysis of the co-authorship network uncovers key figures, clusters, and sub-communities within the network, illuminating the underlying structure and dynamics of the Yiddish intellectual landscape under Soviet influence. Furthermore, the temporal dimension of these connections is explored, revealing the evolution of influential author collaborations over time. The potential applications of SNA in studying other Yiddish periodicals indexed in the IYP and historical resources are discussed, stressing the significance of interdisciplinary approaches in the digital humanities.

TALK ABSTRACTS

EXPLORING THE INFLUENCE OF SPACE ON HERETICAL INTERACTIONS: A CASE STUDY OF STETTIN WALDENSAINS

KAAREL SIKK (DISSINET; MASARYK UNIVERSITY, BRNO)

REIMA VÄLIMÄKI (DISSINET; UNIVERSITY OF TURKU)

DAVID ZBÍRAL (DISSINET; MASARYK UNIVERSITY, BRNO)

This study investigates the influence of space on premodern human interactions, as seen through inquisitorial records of trials with Waldensians in Stettin, 1392–4. We employ a network approach to quantitatively and visually explore the spatiality of heretical interactions. Our dataset consists of data about persons and their relations and interactions, including geolocated information about individual places of residence, origin, burial, and interactions within the heretical community. By analysing spatial patterns, we aim to uncover individual mobility and dissident social spaces that shaped individuals' connections.

We experiment with a force-directed layout, a popular technique that intuitively optimises 2D network layouts, to visualise and analyse our semi-geocoded network. This method can be configured to estimate the optimal centre of mobility for individuals, assuming homogeneous geography. We evaluate the meaning of this optimization in our case study using a custom-built SpatialNet exploration tool. Our analysis includes studying edge length distributions and node locations within the network and spatial robustness analysis of the force-directed layout to model parameters and missing data. By considering the network's structure and spatial properties, we aim to draw insights into the influence of space on human interactions and reveal the mechanisms underlying the emergence and dissemination of Waldensianism. The study aims to contribute to the understanding of the spatial dimensions of human interactions and demonstrate the potential of force-directed layouts for it.

TALK ABSTRACTS

MODELLING THE MOVEMENT OF MAGISTRATES IN ROMAN DELOS

SAMULI SIMELIUS (UNIVERSITY OF HELSINKI)

The modelling of movement in ancient urban spaces is often static: the maps represent the hotspot of movement – the locations where many people gathered – or, in contrast, the locations that were not used frequently. Nonetheless, movement is not static. This paper moves away from a static analysis of the city space and instead models how traffic patterns possibly influenced an individual's choice of routes. In this case, the magistrates of Roman Delos are the point of focus.

Ancient administration was concentrated in two locations: public space – most commonly the forum – and private dwellings. The connection between the public space and administrative activity is well known. Additionally, private dwellings were important for the preparatory work related to administration. This duality created a third venue for the magistrates: the route between the dwelling space and the public venue. Since administrative work in the Roman world was by its nature public, administrators presumably often found it beneficial to select a route used by many. Nevertheless, it is not difficult to imagine – not least because some upper-class Roman writers clearly appreciated tranquility and solitude – that occasionally a quieter route was preferred. The paper investigates what possibilities Delian magistrates had to choose between routes based on a need to either meet with or avoid people.

From a methodological standpoint, this paper connects two commonly utilized computer software programs to model movement. Space Syntax analysis and DepthmapX software are used to model the traffic patterns of Delos. The data produced by DepthmapX is integrated with ArcGis 10.8 software, whereas the ArcMap Closest Facility function is used to calculate different options for movement. The resulting model then makes it possible for users to opt for locations with plenty of people or to avoid those locations.

TALK ABSTRACTS

BENEFITS OF A GRAPH NETWORK MODEL IN COMPARING REWRITTEN TEXTS: A TEST CASE FROM THE HEBREW BIBLE

DOREN SNOEK (UNIVERSITY OF CHICAGO)

SARAH YARDNEY (UNIVERSITY OF CHICAGO)

The CEDAR project at the University of Chicago makes innovative use of a graph network database to model the textual relationships between multiple versions of a work. Sub-projects include the Hebrew Bible, The Book of the Dead, the early English poem Piers Plowman, Shakespeare's *The Taming of the Shrew*, and the works of Herman Melville. This paper will demonstrate how we handle one particularly complex problem from the Bible sub-project. The biblical books of Samuel-Kings and their later reworking in the book of Chronicles pose a thorny problem for scholars wishing to study their relationship. Chronicles at times repeats Samuel-Kings verbatim, at times makes small changes such as updating spelling or substituting synonyms, and at times significantly alters or supplements this source narrative. In some sections, it also seems that Chronicles worked from a different version of Samuel-Kings from what appears in the medieval Hebrew manuscripts upon which modern Bibles are based. The picture is further complicated by the Dead Sea Scrolls, fragmentary biblical manuscripts from the first few centuries BCE, and by the Septuagint, a translation of the Hebrew Bible into Greek from the same period, each of which by turns agree with and diverge from the stabilized medieval manuscripts in ways that suggest that Samuel-Kings and Chronicles were not treated as wholly independent by ancient scribes. This paper will describe the CEDAR data model, how we use it to represent this web of relationships for scholarly research, and how our approach results in more flexible and granular comparisons between texts than can currently be achieved with other tools.

TALK ABSTRACTS

HIGH-RESOLUTION 3D SCANNING FOR THE ANALYSIS OF REED-STYLUS FIBER IMPRESSIONS ON CUNEIFORM TABLETS

MIRKO SURDI (GHENT UNIVERSITY)

FRANCESCO FASSI (POLITECNICO DI MILANO)

FAUSTA FIORILLO (POLITECNICO DI MILANO)

The use of three-dimensional (3D) models for documenting and visualizing cuneiform tablets has significantly increased in recent years. 3D models provide numerous advantages, such as the possibility of rotating the tablet, simulating different lighting conditions, and enhancing the visibility of morphological details. Additionally, digital copies have allowed the geometrical analysis of cuneiform wedges to identify scribal hand-writing and joins. However, one component of the cuneiform wedges has been neglected in previous analyses, i.e., the traces of fibrous impressions of the reed-stylus usually displayed on the left-hand face of the cuneiform wedges. Fiber impressions are unique to each stylus, similar to human fingerprints. Unfortunately, standard 3D measurement equipment cannot acquire the microscopic details of fiber impressions. This study uses high-resolution structured-light scanners, such as Gocator 3504 – LMI technologies (6.7 μm XY nominal resolution and 0.2 μm Z nominal resolution), to visualize and analyze in 3D the fibrous impressions of the reed-stylus on a group of tablets from Ghent University. The examination of fiber impressions will be used as a diagnostic technique to confirm joins, i.e., to determine whether two or more cuneiform tablet fragments have the same fibrous impression, proving that they were written with the same stylus and belonged to the same document. By extending the 3D analysis to the fiber impressions of the reed-stylus, this work proposes a new methodology and diagnostic tool that may be able, in future, to distinguish a set of tablets sharing identical fibrous imprints, thereby suggesting that they were written with the same stylus (and possibly by the same scribe).

TALK ABSTRACTS

CONCEPTUAL DISTANCE: A SEMANTIC NETWORK APPROACH TO ARAMEANS IN THE CUNEIFORM SOURCES

REPEKKA UOTILA (ANEE, UNIVERSITY OF HELSINKI)

JONATHAN VALK (ANEE, UNIVERSITY OF HELSINKI)

Arameans first appear as a significant group in the Akkadian inscriptions of the Assyrian king Tiglath-Pileser I (1114–1076 BCE), which refer to certain (hostile) people as “Ahlamu-Arameans”. In the following centuries, Arameans play a prominent role in Akkadian sources from the Neo-Assyrian period (c. 930-612 BCE). In this study, we employ language technology and network analysis to explore the semantic domain of Arameans in the Neo-Assyrian evidence and to compare it with the semantic domains for several other groups.

Our dataset is the latest version of the ANEE Lexical Networks v.2.0, a set of syntagmatic networks based on the co-occurrence of words in Akkadian. The networks are derived from the June 2021 version of the Open Richly Annotated Cuneiform Corpus (ORACC), which includes 7346 texts in the Akkadian language mostly from the Neo-Assyrian period. The networks depict syntagmatic relationships between Akkadian words. A word’s ego network represents the words that most often occur alongside it. The word “king”, for example, is directly connected to words like “queen”, “royal eunuch”, and “palace scribe”. Because the meaning of words is contextually determined, the range of meaning(s) of a given term can be inferred from the words that regularly feature with it. A word’s relationships and position in the network should reflect its semantic domain. Our study showcases the semantic domains of Arameans and related groups by using network measures like community algorithms and network distance. We check our results using traditional philological methods to establish the added value of semantic network approaches to the study of ancient sources.

POSTER ABSTRACTS

EMBODIED EMOTIONS OF THE LIVER IN NEO-ASSYRIAN TEXTS USING NETWORKS AND WORD EMBEDDINGS

Eleanor Bennett (University of Helsinki)

Studies into emotions in Ancient Near Eastern material have been flourishing in the past five years. The project 'Embodied Emotions: Ancient Mesopotamia and Today' (2022-2025, funded by the Finnish Cultural Foundation) aims to compare how Akkadian, English, and Finnish embody emotions in their respective languages. Previous research into the embodiment of emotions in Akkadian has focused on the emotions related to libbu, a difficult to translate word that roughly means 'inside' (Steinert 2022; Luukko 2021). In this poster I will present the preliminary findings for the emotions related to the liver ('kabattu') in Neo-Assyrian texts.

Word co-occurrence networks highlighted the phrases kabattu was most likely to be used in to express emotions through the application of community detection algorithms and radial axis layouts. Word embeddings were used to find which emotional semantic fields kabattu was most similar to. The latter method measures the similarity of two words based on their usage within a dataset. The findings demonstrate that kabattu was used to express happiness and anger, but was most likely to be used in expressions of anger in the royal inscriptions of the later Neo-Assyrian kings.

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POSTER ABSTRACTS

ANIMATING THE ARCHIVE: AGENT-BASED MODELLING OF HISTORICAL COMMUNICATION

BERNARDO S. BUARQUE (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE, BERLIN)

ALEKSANDRA KAYE (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE, BERLIN)

RAPHAEL SCHLATTMANN (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE, BERLIN)

MALTE VOGL (MODELSEN PROJECT, MAX PLANCK INSTITUTE FOR THE HISTORY OF SCIENCE, BERLIN)

The growing availability of archived correspondence metadata provides digital humanists with valuable resources to visualize, model, and measure past socio-epistemic relationships (van den Heuvel, 2015; Edelstein et al., 2017; Hotson et al., 2019; Urena-Carrion et al., 2022). Techniques like the socio-epistemic network framework can unveil intricate knowledge dynamics across social, semiotic, and semantic layers. However, we still have limited information regarding the inherent biases within the correspondence datasets we use. In other words, as Barabasi et al. (2002, p. 612) write about the earlier uses of scientometrics data: "for any network, before attempting to model it, we need to understand the limitations of the data collection process, and test their effect on the quantities of interest for us." Hence, following the example set by the authors, we propose a generative model of historical letters. We introduce an Agent-Based Modelling (ABM) approach to reconstruct communication in the Republic of Letters.

Our approach involving simulations of alternative pasts represents a discernible departure from empirical historiographical methods while simultaneously aligning with arguments advocated by archival studies scholars. Over twenty years ago, Terry Cook (2001) proposed to reimagine the traditional concepts about the essence of archives, urging a departure from static records towards an emphasis on the dynamic processes that give rise to them. More recently, Verne Harris (2023) conceptualized "deconstruction" as a method of analysis, paying heed to the dynamic process in which meanings of archives are not fixed but rather evolve and are shaped by the ongoing interaction between past, present, and future perspectives (Harris, 2023, p.29). By embracing the capabilities of ABM, the present research transcends conventional boundaries in archival exploration and bridges the gap between established and innovative methodologies in the hope of gaining a more profound understanding of archive formation and continuance across time and space.

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POSTER ABSTRACTS

THE SHIPPING NEWS: TRADE NETWORK, COMMUNICATION AND OBJECTSCAPE IN THE SALENTO PENINSULA

CARLO DE MITRI (UNIVERSITÀ DEL MOLISE)

PAOLO MARCATO (UNIVERSITÀ DEL SALENTO)

This work proposes to use methodologies such as GIS and Social Network Analysis to analyse some case studies centred on the Strait of Otranto and its entanglement with the Aegean-Eastern Mediterranean. Geographical data collected through GIS can be used to identify areas of major commercial activity or community meeting points, while Social Network Analysis can help to understand the relationships between different actors in these areas.

In a diachronic perspective, from the Hellenistic Age to the Middle Ages, this investigation uses historical sources, communication routes and archaeological materials as keys, all of which are useful for analysing the geography, relationships and interactions between people, organisations and communities.

This research is part of a strand of studies conducted in southern Apulia that are summarised here, also focusing on some critical issues in the interaction of the two systems and explaining the ways in which they are used. The aim is to provide new tools for a more in-depth analysis of the history and trade relations between the different communities along the Mediterranean and Salento Peninsula navigation routes.

P O S T E R A B S T R A C T S

DEALING WITH HISTORICAL DATA: READING “AGAINST” GOVERNMENT RECORDS

SAARA KEKKI (UNIVERSITY OF HELSINKI)

This presentation looks at working with sources that were produced to monitor and regulate historical actors. The main commentary focuses on data collected by United States authorities to control Japanese American civilians that were incarcerated (“interned”) in World War II.

We sometimes assume that government data is neutral. However, we should be mindful of power relations and biases related to data collection, storage, and use by scholars. From the data under discussion here, at least three types of biases and conflicts arise, depending on the purpose, for which the data was created: controlling people in confinement, controlling people outside incarceration, and controlling the views of the people.

I will suggest some ways to reconcile some of these shortcomings but also demonstrate how to use them to the researcher’s advantage. By reading the historical records against the intended purpose for which it was constructed, I strive to correct imbalances in the archive, finding new ways to verbalize and visualize the Japanese American incarceration experience.

POSTER ABSTRACTS

GRAIN SIZE ANALYSIS IN MUDBRICK THIN SECTIONS: AN APPLICATION OF DIGITAL IMAGE PROCESSING TO VILLARES DE LA ENCARNACIÓN.

SOFIA KOUKI (SCHOOL OF CHEMISTRY, ARISTOTLE UNIVERSITY OF THESSALONIKI)

MARTA LORENZON (UNIVERSITY OF HELSINKI)

BENJAMÍN CUTILLAS VICTORIA (NCSR DEMOKRITOS, ATHENS)

Grain size analysis on mudbrick thin section is an essential investigative tool providing information about the manufacturing processes, raw materials, and potential cultural implications. While traditional manual methods of grain size analysis have been relied upon for many years, they can be time consuming and prone to human error. However, digital image analysis can offer a faster and more accurate approach. The aim of this study is to apply automated image processing and feature extraction by programming a trained artificial neural network to analyze the grain size distribution and shapes. Python (Spyder 3.9) was utilized as the programming language, and cross-polar light images of mudbrick thin sections from Los Villares de la Encarnación (Spain) were employed. The image processing approach comprises calculating the calibration factor to mm/pixels, converting pictures from RGB to grayscale, adjusting brightness and contrast, and applying filters to improve viewing. Image segmentation was also employed to separate the grains from the matrix and conduct statistical analysis on them. The results show that the methods used may provide more rapid and exact information on grain size distribution and shapes, as well as detect tiny variations in distribution and shapes among samples. Despite certain limitations, the method employed demonstrates its efficacy by offering precise results and detecting subtle variations among the samples.

POSTER ABSTRACTS

MEASURING DEFACEMENT OF BABYLONIAN KUDURRUS USING 3D AND 2D MODELING

SAMUEL REINIKAINEN (UNIVERSITY OF HELSINKI)

Many of the Babylonian kudurrus excavated at Susa display signs of possible defacement. This defacement does not appear random, rather patterns emerge when studying the material as a whole. It is generally thought that the kudurrus were looted to Susa by Šutruk-Nahhunte I or one of the subsequent Shutrukid kings as they campaigned against Babylonia. It is not known whether the Shutrukids also intentionally damaged the kudurrus, although they must certainly be considered suspects, nor do we know what the motives behind the defacement may have been. Clues to these questions may lie in the small marks of damage which scar the surfaces of the kudurrus: by identifying materials, tools, and techniques behind the marks through traceological analysis it is possible to show that the damage is unlikely to be from wear and tear. Furthermore, the technology used for the defacement can give us a rough estimate of when it occurred.

By creating 3D models of the kudurrus in Agisoft Metashape and then converting them into 2D “maps”, topographic and morphological data can be extracted from the marks of damage using software such as Meshlab and QGIS. The quantitative data offers more robust insights into the marks, whereas digital methods make it possible to get more accurate and complex readings than what is usually possible through manual measuring.

P O S T E R A B S T R A C T S

FINDING THE NETWORKS IN THE FINDING AID

REBECCA ROACH (UNIVERSITY OF BIRMINGHAM)

KATHERINE PARSONS (UNIVERSITY OF BIRMINGHAM)

For humanities scholars finding aids (content descriptions of archival collections) are an integral part of conducting archival research. But in our digital drive—to digitise collections or analyse large datasets—they are often overlooked repositories of knowledge. Despite being aids to finding materials, they are not, in the language of tech, highly ‘discoverable’.

This paper discusses a pilot project at the University of Birmingham (UoB) that is examining the potential of utilising finding aids as a specific source of networked and structured data from which new kinds of knowledge can be generated and research questions answered. Bringing together colleagues from mathematics, literature, computer science and library archives, the interdisciplinary team is building a tool to conduct relational network analysis on our collections.

The particular collection we are examining is not focused on the east Mediterranean or ancient Near East, but rather UoB’s cultural studies holdings. The field of cultural studies was founded at UoB and we hold internationally significant archival collections related to this history, not least the recently deposited papers of Stuart Hall (figurehead of cultural studies). However, the collection data is currently difficult to access and understand. As we will demonstrate, this project uses techniques from networks science to create a tool, based on collection finding aids, which allows the cultural studies community to conduct research with an international reach. Simultaneously, this relational network tool enables colleagues in networks science to test theoretical results against real-world networks, and offers archivists a test case in the potential of finding aids to generate valuable networked data and, potentially, as a source for which AI manipulation could prove beneficial. As a tool and project, it has potential application across a broad range of collections, both within and beyond cultural studies.

P O S T E R A B S T R A C T S

PICTURES TO WORD TO DATA. INTERCONNECTING THE ART OF ANCIENT MESOPOTAMIA IN DIGITAL SPACE

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Beside the key characteristics shared by all archaeological findings, such as materiality, stratigraphic context, physical dimensions etc., image-based artefacts provide an additional layer of information made available by the iconographic representation they carry. Images live and communicate through their interconnections with others in broader realms of visual culture, often formed across vast distances.

Documenting the complex network of images organized into significant scenes is relatively easy using the “traditional” methodology based on detailed textual descriptions of the motifs. But how can we turn pictures into machine-readable formats that allow us to perform digital procedures based on discrete numbers? How can we operationalize, analyze and visualize their interconnection?

The project “Annotated Corpus of Ancient West Asian Imagery: Cylinder Seals” (ACAWAI-CS), now based at Free University Berlin, has long struggled with these issues. We suggest a multi-layered approach that combines the segmentation of artworks into graphic and textual components, their detailed annotation according to controlled vocabularies, linkage to authority files, such as Getty Art and Architecture Thesaurus (GAAT) and Wikidata, and a recording system for scholarly attributions of typological and/or stylistic features.

EXPLORING HELSINKI

All of the below suggestions feature clickable links so you can plan your visits accordingly.

- Take the ferry to [Suomenlinna](#), a nearby sea fortress composed of eight islands.
- Experience the [Löyly Sauna](#) and restaurant on the Helsinki waterfront.
- Take a dip in the [Allas Sea Pool](#) in the heart of Helsinki city center.
- Visit the famous [Temppeliaukio Church](#) built directly into solid rock.

Visit one of the many museums and art galleries. Some include:

- [Ateneum](#)
- [Seurasaari Island and Open-Air Museum](#)
- [National Museum of Finland](#)
- [Kiasma](#)
- [Amos Rex](#)
- [Espoo Museum of Modern Art - EMMA](#)
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