



# BOOK of ABSTRACTs

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# **Keynote Lectures**

**(45 minutes + 15 minutes discussion)**

# Lost in Math? Big Data, Close Reading and the Application of Network Theory on the Human Past

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Historical and archaeological network analysis have grown quickly in the last years, now associated with the equally swiftly expanding field of digital humanities. Beyond the mere borrowing of network analytical vocabulary for otherwise traditional narratives, the now easy use of software tools and the appeal of the approach in a “highly connected” and “globalised world” bring about studies of “real” network analysis with graphs and statistics in increasingly unmanageable number.

Furthermore, even the study of the more distant past has become the object of projects of automatic extraction of big data and the building of large complex network models (e.g. the “Virtual time machine of Venice”, <https://vtm.epfl.ch/>). Yet already six years ago, Clair Lemerrier (2012) has warned of the “tendency to build an artificial complexity by mixing heterogeneous ties on long periods, thus (...) obscuring their historical meaning”. Nevertheless, these spectacular undertakings attract much more media attention (and funding) than smaller scale, detailed studies of relational phenomena, wearisomely extracted through a close reading of sources. The latter, however, may run the risk of laboriously producing network models of only limited explanatory value due to small sample size or the fragmentation and inconsistency of the underlying data.

The paper will discuss these phenomena and problems against the background of the most common tools and approaches of quantitative network analysis. It will argue for a more critical evaluation of their standard interpretations in terms of studying the past and for reclaiming explanatory autonomy from a mere “mechanistic” understanding of network approaches.

## **Bias Detection and Theory Validation in Social Network Analysis**

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Working with reliable data, metrics, and methods, as well as valid theories, is essential for advancing network science in a responsible manner. In this talk, I present my group's research on the following question: How do limitations with the provenance and quality of network data, and human choices about measurement influence the results and implications of social network analysis? I show the impact of commonly used techniques for name disambiguation on the properties and dynamics of networks, demonstrate measurement-induced biases in our understanding of triadic closure, and discuss the impact of these findings on our assumptions about social interactions. I also present our results from using standard methods for constructing semantic networks based on text data, compare common approaches with respect to their accuracy, and assess the suitability of off-the-shelf techniques for semantic network construction.

## **How to Learn as much as Possible: Methodologically Sound Computational Analysis for Historical Research**

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Digitization of text and metadata of various genres has brought significant opportunities to researchers across domains. Digitized biographical data has supported historians interested in migration, networks, social developments and canonization, among others. Support of computational technologies such as automatic text analysis and representations in RDF can greatly enhance the possibilities of researchers, but come with risks of introducing biases. This talk will illustrate both sides of the medal when making use of computational methods: what information and possibilities do they bring? But also, what are the pitfalls? And, most importantly, how can they be avoided?

# **Regular Papers**

**(20 minutes + 10 minutes discussion)**

## **Denis Diderot's Egonetwork (s): Methodological Choices and Heuristic Value of Exploring his «Correspondance» (1742-1784)**

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Departing from the sociology of the literary world, this research aims to contribute to the French cultural and social history of the XVIIIth century. Drawing on the specific case of the writer Denis Diderot, I try to reconstruct the representation of his milieu, as it appears throughout his collection of letters. Joining both a monographic interest in Diderot's trajectory, as well as a prosopographic study of the social actors which have interacted with him, this project has a dual stake. On one hand, I explore the composition of Diderot's milieu, departing from his discourse and perspective, and, on the other, I analyze the mechanisms that tie individuals, taking into consideration their history, social dynamics, adjustment to space, and specific forms of sociability.

I propose a perspective rooted in social network analysis. Such a perspective does not come, however, without its limitations. The systematic treatment of sources is impeded, first of all, by their significant amount – that is, about a thousand letters sent by Diderot and some dozens of received letters, between 1742 and 1784. Secondly, the definition of a tie/link is an artificial process, completely in the hands of the researcher, which makes it prone to considerable bias. As a consequence, I try to distance myself from an a priori categorization of relations. Instead, I propose a novel conceptualization of documentary sources, departing from their reading in terms of interactions (“to write to, “to send a –request, acknowledgement” etc.). In this perspective, every action is taken as the actualization of a relation. The frequency of these exchanges, their nature, context, as well as the sociability forms that frame them have the potential of advancing a more nuanced understanding of the ties. This specific type of coding based on actions may, nevertheless, impoverish the actual content of the relation, as it leaves little room for the consideration of the intentions, space of possibilities, silences (such as Diderot's ambiguous relationship with Voltaire), or the discrepancy between actions and their representations. Through the use of technical tools, Diderot's network of correspondence can be recuperated with enough geographic precision of historiographical diligence, leaving aside or, better yet, standardizing the content of interactions as well as their stakes. The statistical treatment of sources forces researchers to lose sight of otherwise important aspects, which can endanger or destabilize the model.

Thirdly, although the interactional definition of links may not solve all problems, it can, nevertheless, shed light on two special typologies of interactions, formulated through verbs such as “to ask for,” and “to send.” In contrast to a more conventional framing of links based on “closed” sociability forms, such as salons, visits or walks, which render rather static images, the sending and requesting of letters open the avenue for a more dynamic understanding of Diderot's network, via a chain of relations that overlap with the circulation path of a sent letter or the favors requested.



# Biographies and Historical Networks: Use Cases for Biographical Data in the Realm of Digital Art History

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In contrast to writing a biography, which is in general about the life and history of an individual, historical network research is concerned with the study of relationships within a larger set of people. Despite these diametric differences, synergies between these research areas can arise. The purpose of this presentation is to give some examples for that.

The ‘Austrian Biographical Dictionary 1815–1950 (ÖBL)’ is the only transnational encyclopaedic work that incorporates mentionable persons who lived and died on Austrian soil after 1815 and before 1950. Every biographical article within the dictionary consists not only of the fundamental facts like name, profession, date of birth etc. but also contains information about education, career, memberships and awards in its main text. As part of the research project ‘The Austrian Prosopographical Information System (APIS)’ biographical data is generated through the annotation of biographies. This data consists of frequently mentioned names of persons, places and institutions which can be subsumed under the term biographical building blocks. On the basis of this data biographical networks can be built.

In case of artist’s biographies, the most frequently mentioned institution is the Academy of Fine Arts Vienna. Established painters of these days like Christian Griepenkerl became professors at the academy and were able to train and shape generations of artists. Among them were some as e.g. Gustav Klimt, Egon Schiele or Anton Faistauer who became even more influential than their teachers due to their works of art. The teachers, on the other hand, were often forgotten. The relevance of these artists can only be reconstructed by means of remarks in the biographies of their pupils. Collecting information about relation types such as “was teacher of” and “was pupil of” from the biographies can shed light on hidden structures and the role of certain personalities within Vienna’s artist community.

Another institution, the artist association Künstlerhaus, represents the most important professional network in the Habsburg monarchy. The membership in that association was an acknowledgement of the social status and enabled access to the sales platform. Comparable to the Paris Salons, the annual exhibitions of the Künstlerhaus was not only an important event but also a place for cultural exchange. In addition to Austrian artists, in the Künstlerhaus works of art from foreign artists were also regularly exhibited. If it was the case that they invited a whole artist group from abroad, foreign artists can be easily identified. In other cases, only marginal marks in the catalogue give a vague impression of the origin.

To exploit these primary sources, several projects in the field of digital art history were started and data bases were established. Since networks are based on tabular data, the possibilities of filter criteria and attributes are limited due to technical standards. But on the other hand, the ideas for what should be read out of network structures are numerous. It therefore makes sense to use biographical data to bridge the gap between ideal conception and the possibilities available to us.

# **Social Networks of Austrian Refugees from the Anschluss in Australia – An Analysis of Meaning Structures**

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Social networks are crucial factors for refugees and consequently have become an important area of research; they are complex social phenomena and cannot simply be regarded as the mere sum of relationships but should rather be seen as the structure of interrelating ties. By combining sociological approaches with methods of biographical research, the proposed presentation explores the meaning structure of networks built by three Austrian, Jewish refugees who fled to Australia in 1938/1939. It describes empirically how their expectations influenced transactions, how networks emerged out of dyadic relationships, which role the single refugee played in that process, and how interwar networks influenced the refugees in setting up networks in Australia. Consequently, the presentation also questions how refugees used their networks to cope with their escape and their integration into a new homeland, and how their forced migration influenced identities and relationship in networks.

The presentation shows the results of a completed research study funded by the Austrian Science Fund, FWF) whose main outcome will be published in an article in the Journal of Migration History in late 2018. It shows the demonstrated benefits of carrying out detailed qualitative research linking it to conceptual and theoretical works about sociological network research and provides a first glance on the various possibilities of analysing historical networks by focusing on meaning structures of networks. As we have seen, an interdisciplinary approach, combining sociological and biographical methods thus focusing on forms of meaning that circulate in individual stories, can be successfully applied to explore the meaning of ties in historical refugee networks. This further enables us to meet the challenges of mapping historical biographical networks and helps us to overcome one of the major obstacles of analytical historical research, the inevitable lack of uniform sources by focusing on relations and expectations individuals had on their networks.

# Does Modelling Try to Impose the Present on the Past?

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Archaeological network modelling often adopts contemporary socioeconomic ideas whose 20th language gets translated into historical behaviour with the simplest of lexicons. This can lead to the impression that the past is just a coarse-grained shadow of the present. The seeming reinvention of a form of systems theory runs counter to the developments in archaeology of the last few decades. As a result, archaeological network theory modelling has not always been widely accepted as a valid way to proceed despite its success in several applications.

To make the point, recent model examples include:

- A Ricardian analysis [1] of Bronze Age Assyrian trade routes assuming iceberg no-arbitrage and valorem transaction costs following a Weibull distribution in a framework of Constant Elasticity of Substitution.
- ‘Retail’ archaeology [2] for city-state formation in the Middle Bronze and Iron Age Khabur Triangle, for which the underlying model has its roots in dynamical urban development models devised, among other things, for the organisation of shopping-malls.

Both papers exploit the archaeological record well, avoiding as much direct reference as they can to their origins, but provide a substantial threshold for archaeologists without algebraic fluency, making it easy to dismiss them for being so at variance with post-processual thinking.

Our intention in this talk is to rehabilitate such modelling for a sceptical audience by stripping out as much of the contemporary econophysics as possible, even when it is not directly visible, and to rewrite the models from a basic epistemic viewpoint (e.g. maximum ignorance) in which the present is absent. The idea is that although the ontology may be borrowed directly from contemporary society the epistemology has much greater generality. Indeed, principles of maximal ignorance or ‘indifference’ lead essentially to the same results as socioeconomics, realised through generalised gravity models of varying sophistication. The authors of [1] and [2] are fully aware of the underlying gravity models that their approaches encode and it is only one step back to recast the models as an interrogation of our indirect knowledge rather than a statement of the detailed behaviour of agents.

In summary, we shall argue that the Janus-like duality of modelling for the past in the language of the present is, on reinterpretation, a valid process without seriously compromising our post-processual sensibilities.

1. Gojko Barjamovic, Thomas Chaney, Kerem A. Cosar, Ali Hortasu; ‘Trade, Merchants, and the Lost Cities of the Bronze Age’, NBER Working Paper No. 23992, November 2017 NBER Program(s): International Trade and Investment.
2. Davis, T., Fry, H., Wilson, A., Palmisano, A., Altaweel, M., and Radner, K. 2014. ‘Application of an energy maximising and dynamics model for understanding settlement structure: the Khabur triangle in the Middle Bronze and Iron Ages.’ *Journal of Archaeological Science* 43, 143-54.

## **A New Methodology for Modeling Socio-Epistemic Networks in Historical Research: The Case of General Relativity**

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The paper presents a new methodology for modeling the dynamic changes in socio-epistemic networks, which are necessary to understand the development of knowledge structures in the history of science. These are complex multilevel networks, whose overall structure is formed by at least three levels: a social network of scientists and institutions; externalized forms of knowledge exchange and preservation; and finally a network of evolving topics. Our basic assumption is that only actors can change the structures of a knowledge system. This doesn't not imply that these actors have to be aware of the knowledge changes they are involved in, but only that the potential exists of becoming aware of these changes. This allows non-statistical modeling of actions of actors, while we need statistical models to analyze the change of the complex networks of co-authorship and co-citation networks. To address this problem, we propose a co-evolution model for simulating the socio-epistemic network. The basis is an actor-oriented model where actors make decisions about where to move to, with whom to collaborate and which research agendas to take based on a cost function which is defined by the current state of their local embedding in the overall network. We define a set of state vectors for each actor, which are given by the weighed adjacency matrix which describes the links of actors to institutions, articles and topics in the multilevel network. The weight of these inter-level links reflects the position of the nodes in their local network. A similar vector can be defined for nodes of different types in the multilevel network. This allows us to define a distance measure to quantify the distance between nodes of different types. This cost function dominates the likelihood for a person to change its connections from one time-step to another.

This methodology is employed to analyze the historical evolution of Einstein's theory of general relativity. Although general relativity became famous worldwide already in 1919, it became part of the mainstream research in physics only after the late 1950s – a process often dubbed the post-WWII “renaissance of general relativity.” Recent historical investigations

have suggested that this “renaissance” might be interpreted as the emergence of a scientific field and of a related scientific community by the 1960s, while in the previous period the socio-epistemic network related to the theory was unconnected or, at best, weakly connected. The recent completion of a large dataset of biographical data in combination with the analysis of the literature allows us to quantitatively analyze this claim and provide robust evidence of the change occurring in the 1950s at both the social and epistemic levels and to define how the two were connected. The network analytical approach presented here reveals the relational structure of the formation of this scientific field, clarify the topics around which the scientific field coalesced and uncover the fundamental role the institutions played as bridges between the social world and the new knowledge represented by the epistemic web.

## **Using Large Photograph Corpora to Explore Regional and Interregional Social Networks of East German Dissident Movement**

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During the last two decades single photographs and photograph corpora have gained in popularity as sources for historical research. The so-called iconic or pictorial turn recognises visual entities (photographs, paintings, pictures, videos etc.) as fundamental for constructing realities, but also for importing historical narratives. In a digitised world our understandings and perceptions of the present and the past are fundamentally bound with and transmitted by visual presentations, pinning historical events rather to visual than textual narratives.

In addition to their important function as carriers of the past, photographs also contain valuable information about past social relations. However, to utilise this information a researcher needs a more structured dataset, a photograph corpus containing rich meta-data, which allows us to explore and analyse contextual information stored in alphanumeric form.

My paper will exemplify how photography corpora could be used as a source for network analysis seeking to explore, reconstruct and visualise hidden historical social networks. The empirical case of my paper revolves around regional and interregional networks of East German dissident movement. The main empirical material explored for network analysis and visualisations consists of a large photograph corpus of the dissident magazine “die andere” maintained by Robert Havemann Foundation in Berlin. The added meta-data of this photograph corpus contains information about e.g. persons, places, and dates for each record. Additionally, files and reports of the East German state security (Stasi) are used to enrich the dataset with issue- and context-related information.

Based on these materials my paper will explore the structure and dynamics of regional and interregional networks from three different viewpoints. First, how did the geospatial structure of the networks change over time. Second, who were the key figures and how did the personal structure change over time. And third, can we extract issue-specific networks, i.e. sub-networks specialised for certain types of dissident activities.

# Modeling the Dynamics of a Rural Credit Market in the 19th Century

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Over the last decade social network analysis has made its way from a frequently used buzzword to an accepted methodological approach in historical research that goes beyond a purely metaphorical use of its terms. A growing number of studies on different topics from all historical periods have shown that theories and methods from SNA can be fruitfully applied to selected bodies of historical sources. However, most historical network studies are still subject to substantial methodological limitations: 1) with very rare exceptions existing studies are limited to a handful of descriptive structural measures and visualizations of network graphs and 2) despite historical data being inherently longitudinal most often they are aggregated and analyzed in cross-sectional research designs.

This paper seeks to contribute to further close this gap. First, potentials and limitations of historical data with respect to stochastic network models will be briefly discussed. This will be further illustrated with a showcase, in which longitudinal stochastic actor-oriented modeling (SAOM) is applied to analyze the structural dynamics of a 19th century rural credit market. The analysis is based on panel data derived from archival records of the village of Ohmenhausen, located in the former Kingdom of Wuerttemberg in Southwestern Germany. The credit market is modeled as an evolving two-mode social network, where debtors are linked to creditors through economic ties (mortgages). The period under study follows a significant reformation of the mortgage legislation, by which it was intended to increase transparency regarding the pledging of immovable property. Results show that after the new laws came into effect, the credit market expanded significantly while the market power of single creditors decreased significantly at the same time. Also, in this period significant evidence for social closure can be no longer found. In line with previous research on premodern markets in general and the market under study in particular, it can be concluded that the new legislation initiated a transformation of the market from a pre-modern state to a market in a more neo-classical sense of the word.

# A Networked Approach to Early Modern News Flow

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Seventeenth-century news transmission was a sophisticated, comprehensive system. It allowed for news about Constantinople to be read in Dublin. News from Lisbon regularly reached Gdansk. And it did this despite having to travel through several languages, political systems and religious faiths. It was relatively simple; to post a newsletter or read a printed newsbook, one did not need to understand the entire system, just the immediate or local section. Early modern news comprised of a network which worked on both a local and global scale. Network analysis is the ideal methodology for understanding this system.

This paper will outline a methodology for collecting node and edge information from early modern news, either printed or manuscript, using information on time and place embedded in each story. This information can be used to create a map of the way in which news travelled across Europe: a system based, but not just reliant on, the increasingly sophisticated and reliable postal system. Using network analysis, the paper will outline the structural strengths and weaknesses of the news network using measures of degree and centrality, showing how a networked view of news can help us to uncover the truth behind the dichotomies of local/national and centre/periphery, and suggest new ways to measure the way in which fake or untrustworthy news circulated in the period.

Network analysis can help us understand the media ecology of 17th century news systems in order as well as disorder. The paper will show how the structure of the news network approximately follows a Barabasi-Albert scale-free model and what that means for network efficiency when the system works as intended, and the impact on resilience in the case of disruption. The paper will discuss real-world examples of ways in which news could be re-routed in the event of war or weather.

The flow of news and information do not exist in an abstract system: the medium on which it travels must move through space, in a process that takes time. An abstract networked model does not fully explore the picture. The paper will outline the average speed of news reaching London from various parts of Europe, suggesting reasons for differences and the impact this had on the network as a whole. Finally, it will compare the network map of Europe with the physical, showing ways in which they can be compared and used alongside each other to gain a greater understanding of the flow of information in early modern Europe.

## **Antonine Plague: Case Study of Epidemiological Modeling and Impact Evaluation**

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Since the beginning the 3rd century crisis discussions, the infamous epidemic called Antonine or Galen plague has been attributed one of the featuring role within the whole process of upcoming downfall of the Roman Empire. During the crisis period various segments and regions of the Roman world experienced different forms of turmoil (social unrest and uprising, economic inflation, political instability etc.) and external incursions (warfare, barbarian raids). Present scientific knowledge encompasses considerable margins of estimated death toll. The main intention of the paper dwells is testing of possibilities of impact on the basis of emulative digital modeling and simulation. Simplified studied geographically explicit context of the cellular framework represents a workspace for spatio-temporal quantitative modelling. Model input data for such purpose include e.g. reconstructed distribution of population density, infrastructure, and clinical data. The vital part of simulation dynamics is defined through the epidemiology mathematics (a compartment model driven by differential equations). Coping with large array of input variables, which are known only up to the limited extent, has constrained establishment of testing scenarios for assessment of possible quantitative and spatial aspects of epidemic impact within the demographic context of the Roman Empire.

## **Women, Men, and Medieval Heresy: Tackling an Old Question through Network Analysis**

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The role played by women in medieval dissident movements has been intensively discussed for decades and various powerful examples, mainly from inquisitorial records, have been cited to illuminate this issue. However, the focus on individual cases necessarily leaves the larger questions unresolved. We lack entirely the big picture of women's actual involvement, and have no idea whether it was any different from that of men. Quantitative studies remain extremely scarce, and they rely on counting numbers of women (and men) or instances of preaching by women (and men). Social network analysis seems to be an extremely relevant approach capable of revealing the social microstructure of medieval dissident Christianity's networks, and shedding new light on this issue. The global question in this paper is whether there is any significant difference among the roles played by men and women as



approximated by various network measures. The data is three large sets of inquisitorial records (ca. 1000-1500 nodes in each network) from Languedoc in 1270s-1320s when this area was an important laboratory of the early inquisition. The paper explores the possibilities and limits of social network analysis of data from inquisitorial records, automatically extracted from indices of personal names, and evaluates the validity of this method against a smaller sample of manually coded data.

## **Family Network and Early Globalization Transnational Space-Making in the Middle East and Beyond**

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The paper focuses on the period of early globalization through the history of the fametworily nk, where the latter is understood as a structure that connects nodes through system of ties/interactions, which in their turn serve as channels for transfer or flow of various resources. Transnational space is understood as the material environment and area of interactions that is produced through communication beyond borders. The paper is based on several case studies of the family networks with main focus on Orosdi-Back family.

The transnational voyage of the Orosdy-Back family was not just an individual adventure of Adolf Schnabel (changed his name into Orosdy in 1846) who after the defeat of 1848 uprising followed Lajos Kossuth to exile in Turkey. It was a history of collective action of an extended family. Following the pattern of chain migration, the heads of the two families founded a business that later allowed their family members to pursue both business and political carriers. The company — later known as Orosdi-Back Establishments — has started as a small shop in the prestigious area of Istanbul - Galata - in 1855. In the second half of the XIX century, the Ottoman central administration tried to infiltrate the land of the empire and thus supported expansion of Orosdi-Back's business. The golden target was Egypt, where around a quarter of a million foreigners were to settle around the time Orosdi-Back launched their business in Constantinople. Just in a year, Orosdy and Back managed to open similar retail enterprise in Cairo, in the area that was the first commercial district outside the 'bazaar'. In four decades the company opened department stores in the several countries of the Middle East (Izmir, Adana, Alexandria, Baghdad, Beirut, Port Said, etc), in Europe (Budapest, Bucharest, Plovdiv, Thessaloniki, Vienna, Paris), and even in Japan.

There is certain disagreement whether to consider EOB a part of a French or Austria-Hungarian capital in the Middle East. The close connections with European countries (including, in particular, Hungary) were of crucial importance for the company development but also for transcending social and national boundaries by their founders. The representatives of the second generation entered both the French and Austria-Hungarian nobility (baron d'Orosd and baron de Surany) and were involved in political and cultural life of the respective countries.

## **Generative Historiography of Ancient Religions: How to Model the Spread of Religions in the Ancient Mediterranean**

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The paper presents results of the research conducted within the framework of the GEHIR project (Generative Historiography of Religion), investigated in the years 2015-2017 at Masaryk University in Brno, Czech Republic, by an interdisciplinary team including scholars of religion, computer scientists, geographers, and mathematicians. This project applied innovative methods previously used in the study of the dynamics of complex systems (e.g. mathematical and computational modelling, network science) to reach a better understanding of the history of four religious traditions active in the ancient Mediterranean: Egyptian cults, Mithraism, Hellenistic Judaism and Early Christianity. Presented case studies focus on 1) the identification of factors influencing the spread of Egyptian cults in the Aegean sea and their relative importance (political and economic factors); 2) the role of environmental factors and the parameters of the transportation network in the spread of Early Christianity; 3) the importance of Jewish subnetwork for the successful spread of Early Christianity in the first two centuries CE.

## **Joseph Cardijn and the “Jocist” Network at the Second Vatican Council**

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The Second Vatican Council (1959-65), which aimed to update the Catholic Church's approach to the modern, industrial democratic world, was only the second “ecumenical council” since the 16th century. It was the first genuinely global council with over 3000 participants (bishops, theologians, experts or “periti” and lay observers) from every continent. Fifty years later, its full implications are just beginning to be understood and implemented.

As the Council unfolded over three years of preparation and four annual three-month sessions, various groups attempted to influence its direction. These groups ranged from national and/or regional bishops groups, particularly the French, German and the Latin American groups, to more ideological groupings such as the progressive “Jesus, the Church and the Poor” group or the conservative “Coetus Internationalis.”

Yet, there were other more informal groupings or networks whose existence has barely been acknowledged in Vatican II historiography. One significant such grouping was the “jocist” network, which formed around the Belgian priest, who became a cardinal during Vatican II,

Joseph Cardijn, the founder of the Jeunesse Ouvrière Chrétienne (JOC) or Young Christian Workers (YCW) movement.

Drawing on a rich Catholic progressive tradition that can be traced to the French priest Félicité de Lamennais and his followers and Marc Sangnier's Sillon movement, the JOC began in the suburbs of Brussels in 1912, holding its first national congress in 1925. It spread to France the following year. By 1939 it had a presence in 50 countries and it had reached 90 countries by 191 just a year before the Council opened. It also spawned a series of sister youth movements for students, farmers and other social "milieux" as well as a series of similar adult movements, all of which achieved global influence.

By the time of Vatican II, many of the founding generation of priests who had adopted Cardijn's methods had risen to become bishops, theologians and specialists in other fields. Of the 2500 conciliar bishops, at least 100 had direct grassroots experience with the JOC, while at least another 100 had worked with other similar movements based on Cardijn's methodology.

Many other conciliar bishops had otherwise supported the establishment of the JOC and its sister movements promoting its methods at seminaries, colleges and universities. Similarly, many theologians and experts, who actually drafted the Vatican II documents, also had extensive grassroots experience with the movements or had contributed to its theoretical and theological foundations. Moreover, the first lay person to address the Council was an alumnus of the JOC.

As my doctoral thesis, *The leaven in the Council: Joseph Cardijn and the jocist network at Vatican II*, demonstrates, this "jocist network" exercised a major influence over the Council documents, including the adoption of the JOC's inductive "see-judge-act" methodology, which has since been adopted throughout the Church.

This paper seeks to explain the emergence of this network and the ways in which it achieved its influence, particularly through its Taine-inspired method of outwardly radiating influence developing from the personal, to the "milieu" to the global.

## **Unseen Divide: Using SNA for Studying the Court Parties in Early Modern Muscovy**

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In 1533, Vasili III, the Grand Prince of Moscow, died leaving his 3-year old son Ivan in the caring hands of his mother and informal regent Elena and a circle of top-ranking aristocrats, the boyars.

Competing with each other for the influence on the juvenile tsar, the boyar clans engaged in a violent and devastating conflict, forming two court parties around the most powerful clans:

the Shuiskys and the Belskys. The boyar quarrel that gave rise to the members of either of these clans by turn and resulted in exiles, deaths, and executions is usually considered to be finished by 1547, when the matured Ivan the IV was crowned as tsar and suppressed the boyar ambitions.

This well-studied conflict is usually pictured as an aristocratic Game of Thrones that had little or no impact beyond the doors of the royal council (Boyar Duma) or the families of those involved. The problem of Court circles, groups, clusters or “parties” was to the best of my knowledge never studied beyond the members of aristocratic families, tied together by the strong ties of marriage and kinship. However, the similar examples of the "Court Parties" of the Early Modern monarchies suggest that a conflict of patrons is usually spread on the level of clients. No explicit narrative evidence of this, however, survive from the Moscovy history of the 1530-1540-s.

Using the method of Social Network Analysis, this study reconstructs the history of the structural divide of the Sovereign’s Court in the middle of 16th century. I use an affiliation network of joint appointments, made by the royal bureaucrat, to map personal connections of the courtiers. Being aware of the informal connections within the Sovereign Court, the clerks usually tried to choose connected people to serve together on a government mission.

The observation of the clusters of the Court Network uncovers a structure of personal ties and divisions in the Sovereign’s Court in 16th century. It turns out that the network structure of the first 17 years of Ivan IV rule (1533-1550) is dominated by the structural division between the Court ‘parties’, the Shuisky’s and the Belsky’s clusters being the largest.

Though network structure will not bring us to the final solution of the Court parties problem, it may help see the internal division of the Court and speculate on the importance of given actors based not solely on their closeness to the tsar, luck, and initiative (which are the dominant explanations now), but on their structural position in the network.

It's also important to note that the divide didn't disappear until 1550 or 1551, though both Shuisky's and Belsky's have lost their supreme positions by 1547. The Court network, driven by social inertia, continued to follow an existing pattern even in the absence of the political cause.

## **The Network of the Students of Basel at the University of Paris at the Beginning of the 16th Century**

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Past research has investigated the meaning of historical networks. This work presents a cultural network of the beginning of early modern times. This regards the network of Basel students at the University of Paris at the beginning of the 16th century. What is particular

about this network is that while it was based at a university, it also involved a business and economic network.

At this university, which at this time continued to be a critical centre of learning, persons from all over Europe studied. In this group figured also students from Basel. At the University of Paris they belonged to the so-called German nation, which included the inhabitants of north and east Europe. The students who came from the Diocese of Basel left their mark in the records of the nation and in particular in their book of accounts (*libri receptorum*) and in a variety of sources including letters from this time.

Looking back quantitatively, at the beginning of the 16th century, this concerned only a small group of students from Basel who studied at the University of Paris. Included in this group were Bruno and Basilius Amerbach, sons of the well-known printer and editor Johann Amerbach. They studied Artes in Paris, as did most of the students from Basel, though some also studied in the higher faculties. They studied together and sometimes lived together and helped one another, including financially. This was the functional core of the network, which was critical to these students, as the majority were also still young. They used the communications' connections between Basel and Paris. Anyone among them who travelled between the two cities would communicate for and through the network various items including letters and the news.

The business of Johann Amerbach and his Parisian partners profoundly influenced this communication network. In Paris he sold his book and from there ordered manuscripts for printing in Basel. Also involved in this commercial communication were other booksellers such as Johann Wattenschnee who, in 1489, took the Office of the Messenger of the Nation. The network of students from Basel was a cultural and intellectual network that was framed within an economic and business network.

## **Dynamic Identity and Weak Ties in Late Soviet Jewish National Movement**

**Galina Zelenina**

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Speaking of social network in late Soviet history, scholars have primarily described the networks of *blat*, or useful connections, serving to exchange resources hardly available in legal and official way. Researchers of *blat* networks argue that the system of informal connections and often illegal transfer of resources emerged simultaneously with state-planned economy and distribution system and became increasingly widespread and effective with the course of time. Meanwhile, Soviet Jews – both in internal and external, laudatory and, much more often, condemnatory descriptions – are attributed with notorious communal and kindred solidarity and nepotism as well as with agility and smartness. In particular, Soviet Jews traditionally were portrayed as masters of connections invariably able to establish themselves and drag their relatives and fellows along. All this makes different milieus of Soviet Jewry potentially productive subject for social network research.

My paper is focused on Refusenik milieu, or Jewish national movement, active in the big cities of Soviet Union from late 1960s till late 1980s. In social network analysis, network is understood as an open and unstable structure that exists only by means of interpersonal ties and implies no established and permanent membership – unlike communities, associations or other organizations. Jewish intelligentsia circles organizing or participating in Jewish cultural or social events and/or struggle for emigration had no official membership or other characteristics of rigid social structure which enables them to be defined as a social network.

My paper is an attempt to make use of relational sociology in the research of Jewish national movement in several ways.

(1) Dynamic identity. According to Harrison White, neither institutions, nor individuals possess any permanent and invariable identities; rather, identities are acquired and changed in the processes of interaction, or by “switching” between different networks. This moment of switching, thus, becomes instrumental in constructing individual and social identities. The next level described by White is creating the narrative of the switch, or story of acquiring one identity and/or losing another. Participants of the Jewish activities, otherwise – ordinary Soviet engineers, white collars, or academics, seem to have constructed, acquired and re-acquired their Jewish identity precisely when switching from their non-Jewish formal network (at work, at the university, in the street or in the grocery store) to their Jewish network, that is Refusenik milieu. In communication with foreigners, in their diaries, memoirs, and interviews these people created narratives of this switch; in doing so they named, acknowledged and confirmed their newly acquired Jewish identity, and in some cases also rhetorically (at least) abandoned their previous identity of a Soviet citizen or a Russian intelligent.

(2) Switching between networks and identities. In late Soviet culture a following consistent pattern is discernible: a character’s official social role is considered an empty shell, a false mask, while one’s authentic self is a private self socially manifested in a narrow circle, in a public of their own (svoi). People from Refusenik milieu both spoke about escape and one-way transition to their newly found “genuine” Jewish identity and appreciated the ability to preserve both identities and roles and to switch between different social networks, formal and informal.

(3) “Weak ties”. As it has been argued [Granovetter 1973], weak ties between individuals paradoxically are more important than strong ties. Innovations are spread, information is passed, and resources are distributed through weak ties. Since everything Jewish including language, cultural knowledge, Zionism, and the very idea of emigration was innovation for assimilated Soviet Jews, we would expect it to be distributed through weak ties. To understand how Refusenik milieu functioned and recruited new members, the scheme of ties serving as channels for the dissemination of Samizdat, presents and money from foreign supporters, and information about current events is to be reconstructed.

## **Metadata for the Middle Ages: A Network Analysis of Manuscriptorium.com**

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Massive digitization of medieval manuscripts in the last decades leads us not only to very high accessibility of the historical documents themselves, but also their "tags" and structure in the form of metadata. The use of metadata, especially provided in the format of XML TEI, could open up new paths of research in medieval studies. One of the tools to understand written textual heritage is network analysis used atop of expanded digital catalogues by processing their metadata. We could ask vast sets of questions concerning our data when we have fine-grained TEI metadata. Beginning from basic codicological views to complex historical analysis of authors comprehended as "compagnons of voyage" and their texts. As a demonstrative case, I will explore the metadata of manuscripts from Manuscriptorium.com deposited in Czech Republic, their structure, and their possibilities.

## **Word Co-Occurrence Networks from Ancient Greek Texts and the Cultural Evolution of Prosocial Religions**

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Word co-occurrence networks represent a popular method with many natural language processing and information retrieval applications, like keywords extraction or automatic text summarization. In network science, these networks are widely studied, as they reveal interesting network features, e.g., the so called small-world effect. Here I focus on construction, analysis, visualization and further usage of a specific subgroup of these networks - namely weighted undirected word-adjacency networks. The network is constructed as follows: whenever two words appear next to each other in a document, there emerges an edge between the two, having weight equal to 1; whenever the neighbourhood re-appear, the weight of the edge is increased by 1. For my research purposes, here I work with a corpus of pro-processed Greek texts with words in their lemmatized form, coupled with part of speech tags ( $N = 25,522,507$ ). From this corpus I extract only words tagged as nouns or adjectives ( $N = 6,957,624$ ). I further divide this reduced corpus into four sub-corpora: (a) ancient Greek texts estimated to be written before the 4th c. BC, (b) texts from the 4th c. BC to the 1st c. BC, (c) texts from the 1st c. CE to the 4th c. CE and (d) texts from the 5th c. CE on. From these sub-corpora, I generate 4 networks. Having them, I analyze neighbourhood of certain nodes in the network, namely the Greek term 'theos', God, especially how the neighbourhood changes from one period to another. For that purpose I apply Dijkstra's shortest path algorithm, with the distance edge attribute equal to inverse edge weight. The texts are pre-processed using Python 3, networks are generated and analyzed with NetworkX and visualized using Plotly. I suggest that this methodology can help us to explore certain hypothesis from the cultural evolutionary study of religion concerning the emergence and spread of prosocial religions in human history.

# **Short Papers**

**(15 minutes + 5 minutes discussion)**



# Isidore's Etymologiae as a Window into Carolingian Intellectual Networks

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In my presentation, I will introduce the project Innovating Knowledge: Isidore's Etymologiae in the Carolingian Period to be carried out between September 2018 and April 2021 at Huygens ING. The chief objective of the project is to map intellectual networks that participated in the so-called Carolingian renaissance.

The Carolingian renaissance (second half of the 8th – end of the 9th century) was the first of three periods of major intellectual flourishing that shaped Europe before the Modern Era. This period of rapid innovation was not a result of a top-down implementation of orders from a single core, such as the imperial court, but stemmed from the interaction between various hubs, principally monasteries and seats of bishops, which maintained schools and libraries, produced books, and supported scholarly activity. By examining the ecosystem of ties between these intellectual centres, and the shape and properties of the network they formed, we can obtain a unique large-scale perspective of the Carolingian renaissance and understand its dynamics.

To map the Carolingian intellectual network and its properties, I plan to use as a proxy the Etymologiae of Isidore of Seville. The most important encyclopedia available in the Carolingian period, the Etymologiae were a dynamic text, opened to rewriting and appropriation by its users. As a result, a standard early medieval copy contains material that was inserted by Carolingian users and reflects their attitudes and perspectives superimposed on the seventh-century text. Many textual innovations of this type can be traced across multiple early medieval copies. By tracing how they emerged, spread from centre to centre and what factors affected the speed and extent of spreading, we can outline the contours of the Carolingian intellectual network. The Etymologiae are uniquely suited for similar research because of the high degree of the dynamicity, and therefore a large number of textual innovations that can be studied coupled with a large number of surviving manuscripts. Moreover, most if not all Carolingian intellectual centres possessed at least one copy, and in many cases, we can attribute Carolingian copies to a known monastery or episcopal seat and therefore pinpoint them in space and time. Also, many of the roughly 300 full copies and fragments have been digitised and can be examined using new digital tools.

## **Socio-History of Global Financial (De)Regulations (1971-1987)**

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My paper deals with global financial deregulations, from the “Nixon shock,” when the U.S. President unpegged the dollar from gold-convertibility on August 15, 1971, to the aftermaths of the financial crisis in October 1987. The specificity of these two decades lies in the setting up of global financial deregulations, the emergence of new financial actors, the redefinition of sovereign States’ prerogatives, and the ascent of multinational oligopolies that reshaped the international chessboard. Despite numerous international negotiations to supersede the Bretton Woods system, no alternative was found, and the flexibility of exchange rates became the new standard. From this point on, financial deregulations spread in various forms, up to 1986-1987, when both London and Paris stock exchanges were utterly liberalized.

By (de)regulations, I mean altogether proper deregulations, but also new regulations, the absence of regulation, or contradictory regulations. (De)regulations are not limited to a set of judicial rules: they involve a constant evolution of the role played by finance in economics, politics, or geopolitics. Hence, (de)regulation reforms should not be considered as a strictly political and juridical issue, but as a global market, whose participants evolve through different spheres. Public and private archives from the United States, the United Kingdom, and France, show the emergence of the figure of the expert, the rise of a new generation of financiers (selected on their Ph.D. in econometrics rather than on their golf handicap), an increasing revolving door phenomenon between public and private sectors, and a global homogenization of the definition of the free market in financial spheres.

Network analysis enlightens the trajectories of decision-makers in finance. The study of several think tanks and lobbies’ directories shows the multipositionality of their members (bankers, politicians, CEOs of multinational companies, intellectuals, and journalists). The financial deregulation market is also a social market that invites us to reflect upon the actors’ strategies and visions of the world. The example of the Mexican default debt crisis in 1982 reveals how liberal transformations occurred in a context of global redefinition of economic rationality. The Mexican ministers elected in the midst of the negotiations with the IMF all graduated in economics in American or British universities, where the IMF experts had studied too. We observe a convergence of language in the reports of their negotiations. My approach thus focuses on the circulation of ideas and the unconscious imposition of the zeitgeist that excluded any alternative to the naturalized vision of financial deregulations.

# **Network Analysis for a Knowledge and Object History of Silesian Modernism. Aesthetic Discourses, Technological Changes, Actors as Objects of Digital Art History**

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The project objective is to analyze the processes of knowledge transfer and the competition between the art, handicraft, arts and crafts, and industry in Silesia (Poland) in the first half of the 20th century. It highlights the network relations of individual/institutional actors and objects, which are studied and juxtaposed in the database with the visualization tools. The local and regional results will be presented in the context of the similar processes in Germany and other industrialized countries in Europe.

The project combines the transdisciplinary aspects of economic and social history with the digital art history. Consequently, it embeds the results of the regional-focused case study in the history of comparable reform movements in Europe. The chosen subject is especially interesting, because Silesia – back then a Prussian province – can be described as the region characterized by the conflict between the “central” and “peripheral” developments in the areas of politics, economy and art.

An implementing of data in the database is the main expected measurable outcomes of the project. The person and object data, which are crucial for the Network analysis, will be prepared and processed in the structured working database. The database should enable the particular forms of results’ visualization that will complement “classic” art historical illustration methods and optimize analysis, understanding and mediation of the data.

The detailed analysis will tackle the question of how the art-/crafts-/technical schools cooperated with the workshops and industrial companies in Wrocław and Bolesławiec. In what way did the different processes (influences of the Werkbund in the capital city of the region, processes of industrialization of the porcelain and glass production, pervading handiwork traditions in the region such as lace and needle work in the Jelenia Góra Valley) construct the network of people and objects?

Moreover, the network analysis and the research into the knowledge transfer processes traces the origins of the term “Design” as the modern concept of production.

The research questions are approached through the methodological traditions from different disciplines: economic/social/ technical/art history. The project analyzes the art theories connected to the subject, the role of the materiality and its history, and the individual and collective actors such as institutions or consumers. It discusses the question of relations between planning, objects and internal rules of industrial business and machinery, which in the end determine the form and production of new objects.

The project will be realized at the Herder-Institute since 1 April 2018.

## **Economic Aspects of Dark Networks**

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In the last years, darknet marketplaces increasingly gained more public awareness as transshipment points for illegal goods. The 2013 founded “dream market” is the second largest marketplace in this area. The transferred goods differ from drugs, data and counterfeit consumables. After the shutdown of AlphaBay it’s the largest still available darknet online market. Beside the general public interests, such data is as well relevant for network scientists. The global embeddedness of drug markets was pushed by the development of dark network structures. The goal of this project is to get a first impression of the ties distribution of the dream-market transactions and to explore their dependencies on country specific nodal covariates. To evaluate this, we analyse crawled data from July 2017 of 1.400 aggregated drug deal transaction offers. For a better understanding of the underlying mechanism, the special focus is on the social inequality between the different locations. For this purpose, we enriched the data with meta data from the Organisation for Economic Cooperation and Development. First results from exponential random graph models show that heterophily tendencies regarding economic factors seem to be important factors for the implementation of a transaction offer. Geographic factors seem to be less important for the price distribution in the world market as well as for the general quality of the distributed goods, excluding Australia.

## **The Conspiracy Networks in the Memoirs by Cardinal de Retz**

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I carry on the investigation about the conspiracy as a network in the “Memoirs “ by cardinal de Retz. Conspiracy social networks are the fundamental features in this source, but the plenty of historians could not deal with these networks because the text is too big and complex. It is impossible to work with this text using traditional ways of the research. Using Historical and Social networks I detect different types of the conspiracy and see the initial structure of the conspiracy. For instance, the First book of the Memoirs is connected with the fight against cardinal Richelieu and avoiding the church career, because de Rets did not desire to be a cardinal. I use different kinds of graphs and layouts to present the essential role of the conspiracy in this source. All actions of de Retz are the part of the conspiracy: not only his political goals and deals, but every duel, every love story are depicted as a part of conspiracy. Only the historical networks can show to us the whole picture of the conspiracy. It is my initial, but not soul goal.

Using the historical networks, I attempt to deal with the perception of time and space in this source. I crate a graph as a mental map. The most essential parts of my research are the time and the spatial features of the memoirs. The narrative and the sequence of the events are the

instrument of de Retz in creating a history of the conspiracy. In a global scope conspiracy is always a game^ somebody knows more than others, so he has the power to act in his interests. So de Retz plays with the reader, he created a conspiracy in his text using some techniques to measure time and space. I suppose, it is rather crucial part of the historical networks research.

## ***Divide et impera: Social Network Analysis of Bohemian Civil War 1248-1249 and its Aftermath***

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The thirteenth century in the Czech lands is undoubtedly the most interesting period for the nobility. From the previous prince period (in 1198 the Czech prince was crowned king), there are already "magnate" families around the throne, where family relations can be very precisely defined (using family tree). During the century, the size of lower nobility increases, sometimes in dependent position towards their more powerful neighbors. The thirteenth century is also the last period when a staggering social rise is made possible for a broader number of aristocrats and warriors (due to the entrepreneurial abilities or service for the sovereign). In addition, the Estates are relatively precisely established over the century.

If the economic and social trajectories of the nobility are relatively clear (widening the gap between the lower and higher nobility), the political development is very dynamic. In the first half of the century an almost invariable group of noble families around the monarchs was established so that the impossibility of political upheaval led to the uprising of part of the nobility and the civil war between 1248-1249.

Using the social network analysis we attempt to describe polarization within the nobility and explain which noblemen joined the uprising in the ranks of Přemysl Otakar II and how their position in the social network influenced their chances to be appointed to high-ranking positions within the kingdom after the coronation of Přemysl Otakar II.

## **Network and Familial Identity: When Network Analysis Shed Light on a Family of French Royal Servants**

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As part of my PhD I'm currently studying the family of the lords of Nemours who served the king of France in his household during the 12th and the 13th centuries. My project is to gain a better understanding of this group beyond the services it rendered to the crown but also to discern the strategy, if strategy it was, chosen to try to ensure its existence in the turbulence of the court. The value of network research for historical studies is generally accepted. But what could it bring to my study? Is this method without any risk for this subject?

Acknowledging the social connections of and within one's family allows us to discern parts of their identity. Indeed, the individuals that they rubbed shoulders with form a group in which the family recognized themselves or with which they had common traits (actions, interests, goals, social background, etc.). Thanks to this method the family are also socially contextualised. This is necessary to enlighten the reasons of the choices made and thus the familial strategy. Moreover, studying the evolution of networks helps perceive alliance strategies and social evolution. To take this further, intra-familial relationships have to be studied and compared to the relations with the outside world. Why? Because this could help grasp the value of the family for their members as they interacted with the court and the royal power.

Thus, network researches promise to be a precious helper for this study especially as the first results are encouraging. The family is, without surprise, integrated in the royal sphere, the king is the first to be connected with them but the intra-familial relationships seem also to be treasured. The family and their members appear to search a balance between their duty to the king and their obligations to their relatives.

However, these results are to be taken with prudence. Quantitative results are always fragile when we deal with the often disparate sources of the Middle Ages. That is why specific measures have been applied to check the validity of a connection. Diplomatic sources have been used for the link they assure between actors of the same legal action or between authors and witnesses. The parallel reading of diplomatic and narrative sources, often more explicit, was also chosen to minimize the risks taken when I opted for network researches.

## Deconstructing the Networks of Ostrogothic Italy: An Approach to Ennodius of Pavia

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The sixth-century Italian deacon and bishop Ennodius of Pavia produced a large collection of texts which include many letters, poems, hagiography, and panegyrics. Ennodius' collection, especially his letters, have long been used by social historians as evidence for the social life of Ostrogothic Italy. Because of this, Ennodius' works are often analysed in isolation from one another. Ennodius' corpus often feels like a loose collection of unrelated documents, a problem compounded by the fact that we do not know the circumstances in which they were collected and circulated except for the fact that this likely occurred after his death.

The proposed short-paper draws upon my initial research into Ennodius' corpus conducted in my recently completed MA dissertation and ongoing PhD thesis. A key problem that my work seeks to understand is the extent to which we can trust Ennodius' literary self-representation of his participation in the networks of influential members of his society. As a deacon in the churches of Pavia and Milan, Ennodius was a participant in the major political and ecclesiastical conflicts of the early sixth century. Ennodius was an intellectual asset of the church who wrote texts promoting the bishops of Northern Italy, supported Pope Symmachus, and praised the rule of King Theodoric. Alongside such works sit letters almost banal in their concern for social life and the maintenance of social ties. It is social ties however that provide the unifying theme throughout all of Ennodius' works and show how a north Italian parvenu was connected to the great senatorial families of sixth century Rome. However, in many cases we only see Ennodius' point of view, thus it is easy to overestimate his significance as an actor in Ostrogothic society. While other contemporary sources exist, such as Cassiodorus' *Variae* and the letters of the *Collectio Avellana*, it is often difficult to place these sources in dialogue with one another.

Ennodius' corpus presents us with a discourse of networks which must be understood in both literary and historical terms. Social network analysis provides a framework in which both approaches can be based. Furthermore, by identifying Ennodius' links to networks beyond his own, we can better contrast his point of view with that provided by external sources. In my paper I will outline my current approach to deconstructing social discourse through SNA with a focus on understanding network emergence and evolution in historical literary texts.

## **Institutionalizing a Loose Network after 25 Years: The “Omladina” Club in New Found Czechoslovakia in 1919**

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In 1894, several Czech students in Prague were accused and convicted of (among other things) high treason. The Habsburg authorities alleged the existence of a secret group, called “Omladina” (“youth”). While such a group did exist at a time, the allegation was mostly fictitious and the trial ended up to be political on character. It did, however, point to the organizational structure of the emerging progressive movement among Czech students: While they did organize in political parties and local pressure groups, in reality they formed a culturally distinct generational network that was to exert influence on Czech politics in the following decades. Although these progressives certainly reached their high point already before the First World War, they tried to organize afterwards as well: Thus in 1919, the “club of the Omladina members of the nineties” (klub omladinářů-devadesátníků) was founded.

In my short paper, I would like to combine my research on the progressive movement as a political generational network before the war with the peculiar question of how to institutionalize such a broad network after considerable time had passed. By looking at such an organization, I would like to deduce several assumptions on network degradation and/or evolution and the question of whether one can speak of the original network at all. The progressive students were a very distinct group, so they lend themselves to such a – quantifiable – analysis.

## **Doctoral Origins of Economics Faculty**

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This paper studies the networks of American academic economists. In 1999 Paul J. Pieper and Rachel A. Willis published a paper in which they examined the doctoral origins of US economics faculty who were training new doctorates in economics in the academic year 1991–92. They found that doctoral origins are highly concentrated, with the top 10 schools producing 47 percent of the economics faculty at Ph.D.-granting schools, 54 percent of the doctoral-production weighted faculty, and 67 percent of the thesis supervisors at 47 top schools. This paper replicates their study from the perspective of the academic year 2017–18 which allows comparing how the concentration of the place of origin has changed over the last twenty-five years. The number of economics doctoral programs has increased to over 130 and the size of the faculty has increased correspondingly. Yet, it remains unclear whether the expansion of doctoral programs has led to a more diverse group of economists in terms of their graduate training or whether the hierarchical structure of the American economics academe has perpetuated itself.



## **Networks of Ideas in the Czech Reformation: A Project-Proposal Presentation**

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How knowledge is transmitted is a fascinating part of human culture. The humanities study knowledge transmission and the connections between ideas with the tools of textual comparison. In contrast, network theory analyses patterns of connections between the elements of complex networks. This tool has been rarely applied to medieval Latin texts, even though these offer an exceptionally suitable dataset for network analysis. Network theory can reveal hitherto unknown connections between medieval Latin texts and authors and can present a complex picture of knowledge transmission in the Middle ages. The Reformation was one of the key elements in forming Europe's current cultural diversity. The Czech Reformation of the 15th century was a significant precursor to its better known 16th-century counterpart. Surprisingly, much of the textual evidence from this period remains unedited and therefore understudied. This, combined with the limitations of textual criticism – the tool traditionally used by historians to establish relationships between intellectual traditions as expressed in texts – makes it difficult to fully understand the panEuropean phenomenon of the Reformation. The proposed project will push forward research limited by the methodological perspective of a single discipline. The well-defined but little known textual corpus of the Czech Reformation is ideal for this innovative approach. Using philology, text mining and network theory, the project will analyse several key issues that circulated within the textual network of Czech reformers. The project hypothesizes that the exchange of ideas among the Hussite reformers was governed by the laws of complex networks. If confirmed, this hypothesis will have a ground-breaking effect on research into medieval intellectual history. The project will analyse how the present binary understanding of the Czech Reformation either as a specifically 'domestic' product, or as the continuation of a tradition previously developed mainly by the English reformer John Wyclif, changes when subjected to the methods of network theory in which patterns and architecture of connections are understood in their complexities. It will show how such a perspective reshapes the current approach to medieval intellectual history as a solely individual-driven series of actions.

## **Early Neolithic Materialized Identity Networks: A Case Study of Vedrovice Cemetery**

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An ongoing research analyzing Early Neolithic (Linienbandkeramik, LBK) burial grounds as networks in Central Europe is presented. The Early Neolithic period is marked by the onset of an agricultural way of life connected with people bearing LBK pottery style (archaeological culture). The existence of burial grounds (Vedrovice, Nitra, Kleinhadersdorf, Elsloo etc.) is one of the most prominent characteristics of the LBK archaeological culture. The burial is constructed by the deceased person's community, thus expressing one's identity as observed by his or her contemporaries. Therefore grave goods deposited within the burial allow us to deduce on this identity. LBK grave goods include both common items, for example, pottery vessels, lithic tools or polished stone tools and rather rare items, for instance, shell beads, spondylus shell arm-rings, stone pendants and so on. These rare items are believed to be connected with people of different social rank, usually interpreted as belonging to a group of "big men" or chieftains. Constructing a network with nodes being burials and edges between the nodes common grave goods or burial characteristics reveal underlying structures (groups) inside Early Neolithic communities, thus allowing us to grasp on both individual and social identity of buried individuals. The paper focuses on employed methods and a case study of Vedrovice cemetery is presented.

## **State of the Union - Semantic Topic Network Structures in Historical Enunciative Practices**

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The state of union addresses are parts of a collection of the most institutionalized and widest broadcasted artifacts of political communication. The availability of such data with information about historical events open a wide range of possibilities for introducing techniques of quantitative text analysis in a synthesis with network analysis. Moreover, recent methodological innovations in the field of quantitative text analysis like structural topic modeling allow hypothesis testing using further information about the specific speech itself.

The goal of this paper is to illustrate via a case study, which changes arise from connecting these methodological approaches in the specific case of historical speeches and how they are limited in their abilities. For this purpose, data about the state of the union addresses were crawled and enriched with information about the presidency. After this the textual data was analyzed using structural topic modeling with a spectral initialization. The resultant topics then were used in a network framework with ties according to their correlation. First results support the existence of party-specific topic relations structures in the state of the union addresses corpus.

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