

# Conference Abstracts

14th Conference  
of the  
International  
Cartographic  
Association  
Commission  
on Cartographic Heritage  
into  
the Digital

## DIGITAL APPROACHES TO CARTO- GRAPHIC HERITAGE

Thessaloniki

**8-10.5  
2019**

Museum  
of Byzantine  
Culture

Aristotle University  
Central Library

INTERNATIONAL  
CARTOGRAPHIC  
ASSOCIATION  
COMMISSION ON  
CARTOGRAPHIC  
HERITAGE INTO  
THE DIGITAL

MAPS &  
GEOINFORMATION  
CURATORS  
GROUP



*Cartoheritage*  
into the Digital



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ANALYSIS

LIBRARY  
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CENTRE

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## Abstracts

### SESSION 1

8 May 2019 16.30-18.30

#### # SLOMSKA K., M. KUC-CZEREK *Warsaw Re-constructing the space of Warsaw in XVIII century. Tracking relation between map and text*

The paper is the presentation of the first phase of works on the project about sociotopography of Warsaw in the XVIII century. The aim of the paper is to present cartographic and textual sources and steps carried to find connections between them. Digitisation of both sources allows representing the link between them.

The basic map used in the project is the city map on the manuscript of the city on a scale of 1: 2500 from 1897, developed under the direction of William Heerlein Lindley as part of works connected with the construction of Warsaw waterworks and sewerage. This is the first reliable fully measurable Warsaw plan and will be the basis for the retrospective. One of the elements of the map are plot numbers, which are also included in the register from 1784 which is a report on the review of the state of development of the city prepared by municipal officials. The tax census covered the whole area of Warsaw. The document lists the owners of the property, their tenement houses, and wooden houses, as well as breweries, mills, and brickyards. It also contains buildings and street names.

Extracts from the text source were attributed to plots on the map. Next, the verification of the attribution was conducted. Street names and vicinity were the features which were used for the control.

Attribution of extracts from the text source to the map will allow presenting the distribution of ownership, types of buildings and location of facilities. The results will be used in further works as the reconstruction of the development of Warsaw and various data about the residents and economy of the Polish capital.

#### # KOUSSOULAKOU A., M. DIMITRIADOU, C. KONTOZI, Y. MITZIAS *Thessaloniki Telling of a city's invisible past through georeferenced historical documents and web map technology*

The subject of the work presented here is to map a part of urban history concerning a newer quarter within the city of Thessaloniki (that of the Exohōn district, formed at the end of the 19th and the beginning of the 20th century) as recorded in a number of notable buildings of the area which were constructed during that period and shaped the quarter's appearance and cosmopolitan character. Cartographic heritage supported by

digital technologies in combination with other documents of cultural heritage can help reveal fragments of the city's stories and depict them on a modern map. To be more specific, a large number of historical buildings of the above-mentioned quarter, most of them non-existing nowadays (and documented elsewhere through urban history researchers) are geographically located, georeferenced and digitized, with the help of historical documents (historical maps, topographic plans from various years during the period of concern and old air-photos). This is a part of the city's history that -although recent- has not been recorded to the detail that it deserves, from the geospatial and cartographic point of view. Given the fast changes in its urban evolution and character it constitutes an attractive area of knowledge, both for specialists and for the general public. For the final cartographic presentation of the data processed in the work, a web mapping environment is chosen, for its multimedia possibilities suitable for presenting additional information at request (photos, text, documents), but also for its potential appeal to the general public

#### # BITELLI G., C. H. CARACCILO, G. GATTA *Bologna A HGIS for exploring eighteen-century manuscript gazettes of Bologna (Italy)*

In Europe, from the fifteenth-sixteenth century, a frequent means for public dissemination of information was given by manuscript news. In Bologna, a manuscript gazette, with weekly issue, circulated at least from the second decade of the eighteenth century. It was intended for the public and reported almost exclusively local news of various kinds, from worldly events of the nobility to crimes. This gazette, collected by A.F. Ghiselli (1634-1730) in his "Memorie antiche manoscritte di Bologna" and today preserved at the University Library of Bologna, constitutes a precious source of information for the study of the Early Modern city.

Aim of the present study is to test the possibility to create a Historical Geographic Information System (HGIS) for the collection, display and search of the news reported in this gazette. For a sample of gazette issues, the news were classified according to the typology and collected in a database; therefore, they were georeferenced on two coeval maps basing on the locations mentioned in the news themselves, having at disposal from the maps the representation of the city with toponyms of streets and places (in particular

the religious buildings and the senatorial palaces).

The study proves once again the usefulness of GIS tools for management of historical archival data: in this case, the news is viewable in an intuitive mode on the ancient and the current maps, and they are accessible and searchable in digital through the database. Above all, the GIS can be used to perform different analysis based on the ancient news, for instance: the count of the number of occurred events for a specific typology in a certain lapse of time, and their spatial distribution; the count of the number of times a given church is mentioned in the news; the display of paths followed in religious processions or other main events. The creation of a similar HGIS appears useful to reconstruct aspects of the historical social dynamics, that could not be easily understood with traditional historical analysis.

#### # KHAN F. *Pennsylvania, PA Exploring Contested Historic Landscapes in a GIS Environment – A study of Lahore, Pakistan*

Lahore, Pakistan's second largest city, has a history which spans several centuries. Much of the historic urban form transpired during the Mughal emperor Akbar's rule (16th c.) when Lahore was made capital. During emperor Shah Jahan's time (17th c.), several notable structures were erected that remain central to the city's cultural heritage. Over the course of the 18th century as Mughal influence waned, Lahore sustained frequent invasions until Ranjit Singh consolidated control over the larger region and established his Sikh Empire (1799-1839). By 1849, the British had annexed Punjab; their presence in Lahore became prominent over the course of the next century and numerous colonial institutions were established. British rule in India came to end in 1947 and Pakistan emerged as an independent state. The myriad influences are etched onto the city's landscape which constitutes a manifestation of contested cultural narratives whereby the evolution of the historic urban footprint represents a degree of malleability between seeming permanence and transience.

This paper explores how various 'contested' sites in Lahore can be mapped and visualized through a layered reading of different data sources in relation to points of interest. The objective of the study is to apply Geographic Information System (GIS) methods to record what used to be at a site, what was lost and what came to be over the years. Archival maps of Lahore are used as a key data source

to identify spaces that have undergone transformation, which are then linked to old photographs, gazetteers, historical and literary accounts, memoirs etc., to describe the extent and nature of change in spatial terms. Integral to the present inquiry is also a documentation of place-names that provide clues to 'missing' spaces or places.

**# BUONORA P., P. MUZI, S. MAGGAUDA**  
**Rome City landscape of a walled city. A WebGIS for L'Aquila ten years after the earthquake**

In 2009 a terrible earthquake destroyed a large part of the historical buildings in L'Aquila, in the middle of Italy. In the ten years after the challenge to save the town never stopped, although it was difficult to maintain the resident population safe and trust in something never done before: rebuild a whole town with its private and public buildings, little houses, aristocratic palaces, churches "where it was, how it was". Moreover, the ancient walled city had changed in depth his structure after the 1960 and even more in the XIXth century: it became a singular mix of modernity and ancient mediaeval town. Municipal papers of the Commissione Edilizia and other archival fonds describe in the projects of many architects and engineers a new city, only partly carried out, and now partly destroyed and replaced by new – more stable – buildings. The project to map all architectural project started finally in 2018, and will show a new map of the city: "where it was, how it was, and how it could have been". In 1981, prof. Stokel made an effort to synthetize a vision of the independent, sometimes anarchical changes that no urbanistic plan was able to rule in the XIXth century, through the archival papers. The project tries now to enhance this approach using a GIS infrastructure available on the web, to be used by the professional who rebuild and maintain the building, and by the people to "recognize" their own town.

As the WebGIS Descriptio Romae implemented in the past years in Rome by a group of architecture historians, archaeologists and archivists, the project uses an interdisciplinary approach to cross the discipline borders

and offer a new approach to archival documents.

**# VOULGARAKIS E., A. TSORLINI, C. BOUTOURA**  
**Thessaloniki Depicting the Greek communities in "Smyrna Zone", Asia Minor at the beginning of 20th century (1919 – 1922), combining historical maps with textual data**

Historical maps are an important part of our cultural heritage and a valuable source of historical data associated with specific periods in the past. For this reason, they are widely used by researchers from various disciplines, studying changes in the area through time or just getting information for a place at different time periods. On the other hand, there are historical textual data and information about places, during important historical facts, which are not depicted extensively on maps.

A geographical region with great interest is Asia Minor, where the first Greek tribes were settled from ancient times. Over the centuries, the largest centres of Hellenism were formed in the area of Pontus and the west coast of Asia Minor. After the end of the First World War, according to the Treaty of Sevres (10.8.1920), the region of Smyrna ("Smyrna Zone") would be governed by Greek High Commissioner for five years to protect the ethnic Greek population living in and around the city, and then, it could be part of Greece after public vote. Three years later, the Treaty of Lausanne (24.7.1923) was signed ending the Greek-Turkish conflict and moving the surviving Greek population away from its roots due to the obligatory population exchange.

In this paper, we combine all the information collected from historical textual sources and descriptions, as well as from historical maps to create a map depicting the Greek communities in the "Zone of Smyrna" from the Occupation of Smyrna by Greek forces in 1919 until the Great Fire and its Catastrophe in 1922. Apart from the Greek communities and statistical information about them, the map shows archaeological sites, ecclesiastical centres and educational institutions, which played an important role for Greeks in the region. The basic steps of the process were: a) the data collection from different historical

sources, their cross-checking and the evaluation of their accuracy, b) the development of a geographic information system, where all this information (historical maps and textual data) is organized and visualized on maps through its digitization and georeference and c) the designing of the map, where information will be depicted and presented according to cartographic and aesthetic rules, making the map easily readable and communicating with its readers in a comprehensive and interesting way.

Each step of the procedure is demanding and challenging for various reasons, especially because data from different sources and in different form should be combined and visualized properly on the map. The same time, the result showing how the area looks like a century ago, where the population consisted of more than 40% by Greeks, is also very interesting and can be used for further analysis or research.

**# RANZI R., M. REBUSCHI, F. GENTILIN, M. BALISTROCCHI**  
**Brescia Geomorphological changes of the Adige river from the Claricini map (1847) and the impact on flood routing**

The topographic map of the Adige river published in 1847 by Leopoldo de Claricini depicting the Adige river valley along a 130 Km river reach in almost natural condition was analysed in its metric content. The map in nominal scale 1:20,736 was first georeferenced and then geomorphological parameters (as sinuosity, anabranching and braiding index and width) were measured and compared with actual conditions. Results were compared with a recent study conducted recently by other authors on a shorter part of the same river reach. The geomorphological diversity of the river today results to be much poorer than in the past. The implication of the observed changes and impact of river engineering works on flood propagation along the river was assessed by hydrodynamic simulation of a critical river reach. The georeferenced ancient river map is used for also for recognising details of the ancient landscape which are definitely lost or are hardly surviving to the strong urbanisation of this beautiful river valley, as dry-stone walls which recently became UNESCO intangible heritage.

## SESSION 2

**# LIPTON B.** *Boston, MA* **Urban Growth in the New England Cultural Hearth: Digitizing, Georeferencing, and Opening Access to Metropolitan Boston Atlases, 1861 to 1938**

Georeferencing large quantities of cartographic resources and making them freely ac-

cessible as GIS layers can seem like a daunting amount of work. We will walk through a successful model for a project of this nature, highlighting useful strategies to digitize, process, and share valuable atlas collections.

**9 May 2018 08.30-10.30**

The Leventhal Map and Education Center digitized and georeferenced 54 large-scale urban atlases of Boston and its metropolitan area from spanning from 1861 to 1938. The majority of these atlases were published by a variety of specialized commercial firms, such



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as G.W. Bromley, G.M Hopkins, and L.J. Richards. In comparison with more familiar fire insurance atlases, they are particularly important for researching immigration and urban change because they include details that emphasize the social nature of the urban landscape such as the names of land and property owners.

This project also includes eleven volumes originally created to support the selling of fire insurance policies; they are very rare and not part of any other digital collection. The earliest atlas is the 1861 atlas of Boston by Charles Pinney, the very first fire insurance atlas of Boston. Equally rare are Daniel Sanborn's 1867 three-volume and 1875 four-volume sets of fire insurance atlases of Boston and neighbouring towns, as well as three volumes of these atlases that were corrected at later dates. These are the earliest publications produced by the Sanborn Company, which came to dominate the fire insurance publishing business by the end of the 19th century. No institution, including the Library of Congress or Harvard Map Collection, holds all eight volumes of Boston's earliest fire insurance atlases. These materials are heavily requested, and this project vastly increases accessibility to these resources.

**# MICHEV B. *Pittsburgh, PA The Re-immersion of Cartographic and GIS Services at the University of Pittsburgh Library, 2017-2019***

Scholarly interest in mapping and GIS is both increasing and broadening. As one group of GIS librarians notes, demand for geospatial resources been observed for several years, [but] recent growth has come not only from established GIS users, but also from a widening breadth of disciplines interested in geospatial tools and resources. At a more basic level, there is also an increasing consensus that spatial literacy and geographic awareness are fundamental life skills. Coming from a university with solid traditions in cartography and GIS, I was interested to observe what the situation was at the University of Pittsburgh when I accepted a position there two years ago. As seen from two documents produced by the University Library System, the importance of these trends was recognized in the annual fiscal year plan by chartering in 2016 a project team to produce a report with recommendations for the development of spatial services in order to promote the ULS' role as a campus hub for geospatial data activity and expertise. In the proposed presentation, I will explore and review the main strategic areas identified by the project team, some specific actions I undertook based on the report's recommendations, accompanied by illustrations. I will touch especially on a very impressive digital project, Historic Pittsburgh, which

comprises primary and secondary sources about the greater Pittsburgh region, including a wide range of maps, manuscripts, visual images, and other materials that support personal and scholarly research. The cartographic highlight is an online map collection comprising 47 volumes (1,800+ plates) published by the G.M. Hopkins Company for Pittsburgh.

I will also describe several faculty projects that needed extensive cartographic assistance, most notably the interactive map I created for the Mapping Religious Pittsburgh project and original maps created for a published article and an upcoming book by Patrick Manning, Past President of the American Historical Association.

**# VARDAKOSTA I. *Athens General Athanasios Daskarolis' historical map collection: a digital approach in "ESTIA", the Institutional Repository of Harokopio University***

The paper aims to present General Athanasios Daskarolis' historical map collection which after digitization is stored in ESTIA the Institutional Repository of Harokopio University and provided under open access. General A. Daskarolis was one of the officers that led Greek troops in Asia Minor Campaign (1919-1922, a highly important and decisive part of Greek history) using those maps, so their historical and cultural value is priceless. The collection consists of 12 maps made by the Hellenic Military Geographical Service. As General's family was familiar with a faculty member of Geography Department, they decided to donate the maps to Library and Information Centre in order to be sustained, processed and used not only by Harokopio's University academic community but by all citizens as well.

The presentation will briefly disclose some biographical information regarding General A. Daskarolis' military action and will describe the maps that compile the digital collection. Additionally, there will be an extensive reference to the standards that were used for the collection to become accessible. Moreover, future actions regarding the better promotion of the geographical information for the wide audience will be recorded.

**# NOVOTNA E. *Prague Database of digitized map collections of the Czech Republic***

A database of digitized map collections of the Czech Republic is open to all digitized map funds and it is used primarily by their administrators but also by researchers and scientists. It was launched in 2017 as one of the initiatives of an open platform for cartographic documents in the National Committee of UNESCO. It is operated and managed on the server of the Faculty of Science. It was updated and filled in through questionnaires in

2018 and 2019. The fields with the information about the collections are filled in detail. They include physical and web addresses, information about collections, a brief description of physical and digital fund, specification of descriptive metadata and image files, of services and aggregation to higher units. The data update is carried out by authorized administrators or database administrators. Currently it contains information about 14 Czech and Moravian digitized map collections. The collection search is also possible on an underlying map. Available methodologies have been added to process and to make cartographic works available.

**# PAVO LOPEZ M. *Madrid In defence of the facsimiles: World's cartographic treasures in a single room***

One of the areas where digital technologies have improved the quality of the cartographic work is, without any doubt, the production of facsimiles. High resolution digitization and printing, along with the splendid imitation of the original materials (parchment, vellum or paper) have yielded high quality reproductions of some of the most valuable pieces in the history of cartography. Although fine facsimiles have existed approximately since the XIX century, the development of technology and materials has been a big step forward in terms of fidelity to the original. This almost perfect imitation of the look and feel of the original maps and atlases makes possible to get access to priceless cartographic heritage for many people. Facsimiles are also excellent tools for studying documents with restrictions to access and allow gathering an impressive collection of clones of pieces otherwise impossible to get together. Even the owners of some unique pieces exhibit facsimiles instead of the original ones because they are almost impossible to distinguish and it helps to the preservation of the heritage.

One of the tasks of the National Geographic Institute of Spain is to promote the knowledge of cartographic heritage, not only ours, but also the masterpieces of the history of cartography. Our increasing collection of facsimiles is part of our policy of diffusion of cartographic culture and we consider that the IGN, as a public organization, must purchase this kind of documents, usually too expensive for the majority of people. Facsimile production is also a curious example of cartographic heritage into the digital for going back to the analogue.

**# COWEN D. *Columbia, SC Opportunities for Academic Librarians to Support Story Maps***

This paper explores the ways that Esri Story Maps are being used in various academic settings and the important role that librarians

can play in support of these applications. Fostered improved procedures, templates and cloud-based storage Story Maps have become a powerful web-based communication outlet. In fact, last year 300,000 story maps were created and more than 700,000 in various subject categories are available through ArcGIS Online. Access to Story Maps is having a significant impact on academic users across campuses. For example, to share content, many instructors have found that web-based Story Maps provide an attractive interactive alternative to traditional static presentations. Within the classroom, a Story Maps can be preferred to a traditional term papers for many projects. Through the creation process, students learn to utilize tools to acquire relevant content and a design compelling story. The Story Map becomes an important part of a student's assessment and provides an online portfolio to showcases their skills. Academic researchers are adopting Story Maps to publicize research findings, share data and provide links to additional materials. While Esri provides various on-line tools for creating an application most new users require technical support to start the process. Recent interviews in North America found that the campus library often provides this support

and library staff are the friendly conduits to nurture the process. The range of services include workshops to introduce the capabilities, technical support to establish the computing environment, hands on training in initial implementation, directions to content, discussion about legal and copyright issues, and recommendations about graphic design for effective communication. The growing number of examples suggests that with proper training and resources academic libraries can be well positioned to support a dramatic new movement to share maps and spatial analysis.

#### # FLEET C. *Edinburgh Surveying and analysing users to plan future developments for online map collections*

This paper will report on the results of a major external survey of the National Library of Scotland maps website (<https://maps.nls.uk>) users in early 2019. The survey focused on three main areas: what the main uses / purposes were for the users in visiting the website; what the main priorities should be for improving the website (e.g. functionality, content, search and retrieval, infrastructure); and opportunities for partnerships and collaboration. One thousand user responses

were gathered by an independent market-research company, supplemented by 10 in-depth interviews with selected users.

This survey has formed part of a wider review of website usage over the last year which will also be reported on. Google Analytics as well as logs of specific page views have been gathered and summarised. In early 2019, the NLS maps website saw on average 8,000 users per day, with around 40,000 page views, looking at over 200,000 online maps, and so these form significant and quite meaningful totals. For example, it has allowed clear ranking of what the most viewed categories of historical maps were, what the most used applications on the website were, where users came from, what devices they used, and how long they spent on the website.

This survey and review form a component of a wider piece of work, to plan the long-term future development for the maps' website. Current usage and user opinions are a key component of this. It is hoped that the wider sharing this survey and its results will be of value to other cultural heritage institutions, both in evaluating mechanisms of surveying website users and usage, as well as for planning long-term maps website content and strategies.

### SESSION 3

#### # NETCHINE E. *Paris Digital approaches of the cartographic heritage in a national institution: maps and geodata of the BNF*

For the purpose of developing cultural and academic access to its huge cartographic heritage, BNF has developed digital solutions in the field of cartography. Historical collections of maps and globes are a main area the maps department, from 3d digitization (with the help of DNP), to the creation of selected corpus in the wide offer of digitized documents. Native numeric maps storage and access are also a big goal in a heritage institution. This paper proposes a panorama of digital based programs developed by the BNF on cartographic data.

#### # BANDROVA T., M. KONECNY, Z. STACHON *Sofia, Brno Digitization and Use of Cartographic Heritage in Bulgaria and Czech Republic*

Old maps are a valuable source of geographical, historical and socio-economic information which is frequently not fully available even if archives make digital raster images accessible. The paper describes the state of the art of the rich cartographical heritage of Bulgaria and the Czech Republic according to their storage, digitalization, metadata, and use.

As the example from Bulgaria the National Library "St. St. Cyril and Methodius", Sofia contains the country's most sophisticated collection – 10 648 atlases, maps, and globes. The collection is a rich source for studying the history, geography, and ethnography of Bulgaria and the countries of the Balkan Peninsula, Europe and other continents. At present, the Library owns all modern Bulgarian cartographic production and many foreign publications as exceeds 140 000 library units. The digitization of the heritage stored in the National Library began in 2006, and in the fall of 2007, the scanned images became available for use through the Library's website. By the beginning of 2018, a total of about 400 000 files / manuscripts, old printed books, graphics, cartographic publications, and others were scanned and included in the Digital Library. Digital copies in their full volumes are freely accessible. The cartographic collection is the best suited to the country with over 10 500 editions. Old replicas and originals of maps made by world-famous names in cartography such as Sebastian Munster, Gerhard Mercator, Abraham Ortelius are kept. The most valuable Bulgarian and foreign cartographic publications are envisaged for digitization. Among the digitizers are: Bulgaria at King Simeon; Turcicum Imperium, XVIII c.; Walachia, Serbia, Bulgaria, and Romania, 1634. An example can be

seen in Figure download (source: National Library, Sofia).

The most important map archives in the Czech Republic are represented by The Central Archive of Surveying and Cadastre, The Digital Map Collection of the Faculty of Science, Charles University and Map Archive of the Moravian Library, which digital copies of old maps online and also try to develop tool and procedures for old maps cataloguing, digitization and accessibility. There are also several regional map archives which are limited by volume, funding, etc. As an example, we present the Map Archive of the Department of Geography, Faculty of Science, Masaryk University. Map archiving on the Masaryk University, Czech Republic started with the foundation of the university in 1919. There are over 18 000 maps and atlases stored on the Department of Geography now and this number is still growing. Most of the maps are already in digital form and these maps are accessible to the specialists and the wide public at all. The process of map digitalization had targeted the creation of the standardized database of old maps and map series including its spatial extent, spatial reference system, authors, etc. The result could be beneficial in librarian fields, i.e. for searching existing map exemplars in different libraries, for the avoidance of duplicity and redundant digitizing.

### 9 May 2019 11.00-13.00

The online available results of the old map digitization process are very useful for historical and time change studies (e.g. land use, urban planning, and agriculture), for teachers, historians, cartographers, diplomats, governments, etc. Thus, the information derived from the old cartographic materials can possibly contribute to modern society development in the field of education, city/landscape planning, crisis management, and others.

#### # DENIS L. *Cambridge, MA Using Wikidata to Extract Cartographic Resources from Archival Collections*

In my work at the Harvard Map Collection, I sometimes create collection-level library catalogue records for cartographic materials that are archival in nature, a rare subset alongside our atlas and sheet map collections. These materials, such as field notebooks containing mathematical calculations and landscape sketches, are challenging to catalogue using traditional map cataloguing standards. Because of the difficulty of classifying them and the limits of a non-archival cataloguing environment, I have had to use precise but limited cataloguing vocabulary to describe them physically, e.g. boxes containing notebooks. However, describing these materials at item-level is vitally important to map researchers, who often wish to trace the relationship between these archival documents and the maps they were used to create. Recently, I have turned to open Web solutions that can assist researchers without the adoption of new cataloguing practices for the sake of a small number of outliers. Using Wikidata to apply the relational philosophy of Linked Open Data to assert connections between field notebooks, maps, and published atlases, we can demonstrate relationships of these interdependent documents. For example, see the field notebooks of cartographer Erwin Raisz at this catalogue record (<http://id.lib.harvard.edu/alma/990148216920203941/catalog>). The record is collection-level, but I used Wikidata to link one of his notebooks, Wikidata entity number Q60390698 (<https://www.wikidata.org/wiki/Q60390698>), to a national atlas of Cuba that he co-created using the notes from this volume. After adding more information to Wikidata, SPARQL queries can be built to demonstrate relationships between resources. These queries will aid people who research archival references to map creation, including digital humanities practitioners who need to harvest cartographic data. As more libraries adopt and populate Wikidata, I believe my work presents a scalable example of how we can make existing data more expandable and efficient for ever-increasing digital approaches.

#### # GOERZ G., C. SEIDL, M. THIERING *Rome, Erlangen-Nurnberg, Berlin Linked Biondo: Modelling Geographical Features in Renaissance Text and Maps*

Bibliotheca Hertziana's project "Historical spaces in texts and maps" aims at a cognitive-semantic analysis of Flavio Biondo's "Italia Illustrata" (1474). At focus are relations between historical maps and texts aiming to explore the historical understanding of space and the knowledge associated with it. Our research combines cognitive-semantic parameters such as toponyms, landmarks, spatial frames of reference, geometric relations, gestalt principles and different perspectives with computational linguistic analysis. With contributing to Spatial Humanities we are convinced that all maps are cognitive maps, depicting culture-specific spatial knowledge and practices.

Recogito is being used as the main tool for static annotations of places and persons/people in text and maps. These are complemented by cognitive-linguistic spatial role markups by means of the brat tool. Moreover, special emphasis is put on the narrative aspect of Biondo's text which indicates an event-based representation of movement. To achieve a generic semantic level of linguistic and map-related annotations, we pursue the transition to an ontology-based representation. For this purpose, we define a domain ontology based on the event-based CIDOC Conceptual Reference Model (CRM, ISO standard 21127) and its spatio-temporal extension CRMgeo in OWL-DL, and appropriate mapping rules to be applied to the annotations exported in CSV and RDF formats. Using the CRM opens up a wide spectrum of interoperability and linking to many web resources. Ontological enrichment with CRM as the top conceptual model would provide an "assignment event" which has open positions to be filled or linked with the semantic roles, resp., for agent, constituents, time-span, and place. This allows a semantic interpretation of annotations such that, e.g., for each Place-Name we generate an instantiated CRM description in RDF/OWL triple format, ready for publication as Linked Data. In the same fashion, mappings are applied to the results of spatial role labelling: These triples encode cognitive parameters, primarily "figure - spatial\_relation - ground" constructions.

#### # ZENTAI L. *Budapest Preserving our national atlases*

National atlases are the most respected cartographic products, regularly made by a national mapping agency or other nation-wide scientific organisations. Preservation of these products is important not only for cartographers, but rather the whole country. From the 1980s, mainly for marketing reasons, national atlases entered a new era. As

the production costs of quality atlases increased, market demand fell. In order to broaden the market base, publishers issued several smaller-size thematic volumes, targeting the more prosperous and educated middle class and people involved in public and higher education. Whereas in earlier decades a national atlas had been considered the "business card" of a nation, presenting essentially only the positive sides of a country, from this time onwards atlases increasingly presented the challenges facing nations. The contents of atlases reflected not only scientific research, but also the interests of potential readers. These modern national atlases were sometimes published in dozens of parts, and alongside the conventional printed copies, their electronic versions were also issued from the end of the 1980s.

Nowadays most of the recent national atlases are published in interactive on-line versions, but even the preservation of the paper volumes is challenging mostly due to the size (the large physical size of the volumes and even the number of maps). But preservation of digital versions, especially the interactive versions is even more complicated.

#### # ROSET R., C. MONTANER, D. BARROT *Barcelona How to recover and preserve hybrid map series produced at the end of the 20th century*

From 1983 to 1992 the Institut Cartogràfic i Geològic de Catalunya produced a 6.317 sheet orthophotomap series, that started as an analogic film process and over the years turned into a digital workflow.

All the digital materials related to this product were stored at the ICGC, and a bibliographic record of the series and the sheets was kept.

In 2018, in the context of the preservation operations carried out at the ICGC, the task to recover and properly document this product using digital archaeology techniques has been documented and summarized in this presentation.

#### # BOUTOURA C., A. TSORLINI, A. NASTA, E. LIVIERATOS. *Thessaloniki A bottom-up scenario for highlighting the Culture of maps by mining relevant untapped wealth of sources in an Academic Library*

It is presented an empirical operational scheme on how the heritage of maps can leverage the impact of an Academic Library under conditions of ill functioning due to a prolonged Crisis if bottom-up operational approaches are smoothly applied. As conditions of Crisis here are meant the long duration of the University poor financing causing limited resources for the normal operation of the Library and especially for the planning of future endeavours, combined with the also general poor understanding of the cultural

value of the legacy of maps under a top-down administrative university model. Although such a top-down model can work with no problems in the absence of Crisis conditions, with enough financing available and good general understanding of Cartographic Heritage, in opposite circumstances the operational obstacles for an Academic Library are important. Especially if the library, its traditional mission apart, aspires to be extrovert, to highlight its presence not only in

the academic environment but also in the society, to promote its value, to attract broader national and international interest about its wealth, to establish a brand name as a leading library.

Based on the real example of good practice implemented in the period 2016-2019 by the close cooperation of the Central Library and the Laboratory of Cartography and Geographical Analysis of the Aristotle University

of Thessaloniki it is shown how the shortcomings of the top-down administration and operational model regulating an academic library under the conditions of Crisis can be overcome, when locally bottom-up approaches are applied in combinatory modes. After listing the bottom-up principles applied in the specific cooperation, the actual positive results are illustrated proving the validity of the model, but also the weaknesses among which risks for viability stand major.

## SESSION 4

### # BALLETTI C., F. GUERRA, P. VERNIER, S. CAMPAGNOLO, S. PUGLIESE *Venice The replica of Mappa Turchesca*

In recent decades, 3D acquisition by laser scanning or digital photogrammetry has become one of the standard methods of documenting Cultural Heritage, because it allows you to analyse the shape, geometry of any artefact without necessarily coming into contact with it. The recording of three-dimensional metrical data of an asset allows to preserve, monitor, but also to understand and explain the history and Cultural Heritage shared. In essence, it constitutes a digital archive of the state of fact of an artefact, which can be used for various purposes, remodelled, or remain safely stored. With the introduction of 3D printing, digital data can once again take on material form and become physical objects from the corresponding mathematical models in a relatively short time and at often low cost. This possibility has led to a different consideration of the concept of virtual data, no longer necessarily linked to simple visual fruition. The importance of creating high-resolution physical copies has been reassessed in the light of different types of events that increasingly threaten the protection of Cultural Heritage. In this context, the possibility offered by digital technologies to bring new life to the wooden matrices of the Turchesca map opens up new scenarios also in the context of our cartographic heritage.

The paper tells of the collaboration between the photogrammetry laboratory of the Università Iuav of Venice and the Biblioteca Nazionale Marciana which has as its objective the realization of a replica of the wooden matrices of this cartography absolutely unique in the history of cartography production and its updating in a totally digital scenario.

### # JILKOVA P. *Prague Exploring the History of Mapping North America Through a Cartographic Analysis*

Studying old maps, we can gain valuable information about the state and the extent of geographical knowledge of particular area at

a certain time. In this study, a cartographic analysis of selected maps depicting North America within the 16th to 19th century is performed with the aim to illustrate the progress in depiction of the continent over the given period. Firstly, basic cartometric characteristics describing the map geometry (scale, rotation angle and map projection) are determined for each map using the detectproj software in order to georeference the maps properly. Subsequently, the analysis of positional accuracy of topographical content is conducted for each map in ArcGIS. Based on the results of the analysis, the study assesses the development of positional accuracy of topographical content and the transformation of depiction of the continent in maps through the given period. The results are discussed in historical context, mainly in relation to the process of exploration of the continent. Graphical outputs of the analysis are presented in the form of thematic maps that are planned to be published in an interactive web application. Besides thematic maps, the application will contain detail description of analysed maps including comments on interesting geographical mistakes that can be found in each of the maps and the brief history of exploration of the North American continent.

### # MEDYNSKA-GULIJ B. Poznan *Eighteenth-century topographic manuscript maps in 3D models*

Research work on topographic manuscript eighteenth-century maps has involved producing 3D digital models according to different parameters of perspective using geoinformation technology. This enables users to view the flat surface of a map from a given perspective or a specific point of observation, with adjusted altitude regarding the landform thus presented. Based on these detailed descriptions of the maps, it is possible to discern their general formal characteristics and, from that to outline preliminary conclusions about their authors' cartographic concerns and drawing styles. This is helpful, too, in

moving from the maps' two-dimensional representational forms to their 3D form. A painterly and drawing manner, which employed sophisticated means of graphic expression, with harmonious colours and imitation of natural features, e.g., the early Habsburgian style (map of Sicily from 1722), the early British style (map of Scotland from 1748), and the Savoy style (map of Susa Valley from 1764). In the case of the painterly styles, the final visual effect was determined by author's individual predispositions. With the use of water media and related drawing techniques, maps represented topographic information about specific areas in the form of a consistent visual message that, in many instances, could be associated with landscape painting. This was because, the professional affinity of the map draughtsmen to the landscape painters was on occasion especially close. Author of this research will demonstrate a technology of creating 3D models from details of the unique maps with different perspective-related geometrical parameters in terrain representation include: the location of the observation point, the location of the projection axis relative to the terrain surface, the viewing direction, the angle of view, and the main point on the map, as well as the choice of direction and contrast of lighting.

### # STAMNAS A., O. GEORGOULA, P. PATIAS, M. TASSOPOULOU *Thessaloniki Three-dimensional representations of Byzantine architecture in pictorial maps*

Representations of Byzantine architecture can be found in old mosaics, frescos, manuscripts and pictorial maps. These artworks depict churches, castles, walls, landmarks etc. in their broadest geographical context. Although most of the depictions of the built environment are generalized and simplified orthographic projections of the facades of the buildings, noteworthy three-dimensional representations can also be identified. These three-dimensional representations are mostly axonometric projections showing other facades of the buildings, the number of

floors, roofs, decorative and morphological elements etc. Normally, the focus of these representations was set only on major and structures and not the commonplace infrastructure. Most of the time, they are not attempts to portray the Byzantine city or landscape accurately and in detail or to determine the actual location of the buildings, as they adopted conventions that lessened the value of their representation.

As the majority of these structures, including many significant buildings, was later disappeared or was substantially modified, it's not always easy to associate these representations with the current industrialized cities such as Thessaloniki, Istanbul etc.

This project is meant to complete a thorough research on how, buildings, landmarks and monuments of byzantine cities were depicted (usually in a symbolic way), what are the focal points for mapping and representation and how they were emphasized by cartographers or artists, how the interstitial urban tissue was illustrated etc. In this context, this project aims at exploring the boundaries between accurate representation and symbolic meaning identified in the Byzantine artworks and assisting archaeological and architectural research into the topography of the Byzantine city.

# JANATA T., J. CAJTHAML, E. HOUSAROVA  
**Prague Possibilities of Publication and Administration of Extensive Multi-sheet Raster**

#### Data on Example of the Vltava River

In the past, a number of cartographic works, issued within a proposed map layout, were created using individual map sheets. Until the onset of the digital age, it was within the then possibilities the only, easy-to-understand solution how to depict extensive territories in a detailed scale. In the second quarter of the 19th century, the first version of cadastral maps of the then-established (Stable) cadastre, whose coloured imperial imprints\ have been preserved, provides a valuable source for the study of the landscape of the first half of the 19th century in the Habsburg monarchy.

These maps are very accurate and precise with respect to the era of their origin, but there are certain limitations in the processing and study of this map series through methods of digital cartography, given by its specific properties. Especially its insular character, when the maps were published both in the nomenclature of map sheets but, at the same time, according to individual cadastre units. This means that even a small area of several square kilometres is usually depicted on several dozens of map sheets, often merely fragmentally covered by drawing. This is why lucidity of this series suffers but, at present, various projects, being carried out insularly within Czechia, succeed to restore the lucidity by working out individual maps in the form of a seamless mosaic, with the help

of costly manual georeferencing using hundreds of control points. This paper aims to inform about the advantages and problems of the solution, where, within GIS environment using Esri technology, the Stable Cadastre map sheets are joined together to geodatabases using the Mosaic Dataset data type and through Image Services distributed over the Internet.

The Mosaic Dataset data type is designed for similar data sets, but with the practical deployment and filling of the database in the order of hundreds to thousands of map sheets, there are both obvious and startling problems of the used platform, which are being continuously analysed and corrected within the ongoing project at the authors' department.

Using the exemplary data of the entire course of the Czech Vltava river, the paper introduces properties and features of the used technology and also brings a summary of observations and recommendations for the successful practical implementation of the mosaic data set, which appears to be a progressive solution for the management of many-hundred-sheet data sets in GIS environment and their use within standardized map services when designing map applications.

## SESSION 5

# VERSTOCKT S., K. MILLEVILLE, D. ALI, F. PORRAS-BERNARDEZ, G. GARTNER, N. VAN DE WEGHE  
**Ghent, Vienna EURECA - European Region Enrichment in City Archives and collections**

The interdisciplinary EURECA (European Region Enrichment in City Archives and collections) project follows the trends towards location based services (LBS) and personalized/contextualized content, and investigates them in the context of cultural heritage collections of European city archives. EURECA focuses on finding traces (or origins/influences) of European regions that have shaped the cities in which we live today and develops tools to easily explore them when visiting a city. The spatio-temporal metadata that is automatically generated by our tools can be used as input to perform new fundamental research and applied studies, but also to facilitate the exploitation of the collections to a broader public and attract new groups of cultural heritage consumers. LBS that run on top of our enrichments, for example, will allow tourists to explore the traces of a specific European region (e.g. Austria) in the city (e.g. Ghent) and show them the collection items

at their corresponding point of interest (POI) using their mobile device. These connections that link Austria to Ghent (for example) can be rather diverse, such as architectural traces, cultural events, art, place and street names, and memories of foreign academics/researchers. Different media-types, such as handwritten student/foreigner registers, pictures, newspapers, and wiki pages, are investigated. Natural language processing (NLP), computer vision and semantic intelligence techniques are the computational tools that are combined to automatically enrich the media items and link them to a particular Region of Origin (RoO). Furthermore, to get an idea about what cultural heritage items are popular by visitors from a particular region of origin, we also query social media platforms and generate RoO heatmaps of the cultural heritage points of interest (POIs) of today. These heatmaps can be compared across different regions or over different periods in time using standard and advanced GIS-techniques.

# ALMEIDA B., R. VAZ  
**Lisbon The MEDEA-CHART Database: A step into the future of**

#### the study of medieval and early modern nautical charts

MEDEA-CHART is a project studying European nautical cartography from the advent of the earliest known portolan charts to the planispheres and nautical charts of the 17th century. Although these objects have been studied for many years, we still do not understand several aspects of their construction and use. The MEDEA-CHART project aims to push forward the study of these important objects by means of an interdisciplinary approach that uses powerful digital tools - such as cartometric analysis and numerical modeling - as a compliment to traditional research methods. So far, the work developed within the project has provided very interesting and promising results that uncover the geometry of portolan and latitude charts.

At the same time, one of main objectives of the project is the construction of a database of nautical charts from that period. Presently, there are a few online databases and spreadsheets that provide useful information to the community of historians of nautical cartography. Nevertheless, the relevant cartographical data about authorship, archives, digital





reproductions, toponymy, geographical zones, etc., is often scattered and not well-coordinated, thus, affecting the usability of those resources for historical research. The MEDEA-CHART database organizes, updates and centralizes that information, besides providing a modern and user-friendly online interface to both the community of researchers and to the public.

This talk presents the MEDEA Project and focuses on the development of the database, mainly concentrating on its implementation, the technology behind it, the stages of implementation, main issues and development challenges.

**# AREVALO E. *Manchester Quality assessment criteria for cartographic heritage dissemination: a preliminary analysis of 300 websites***

This research reviews a sample of 300 web-

sites providing access to historical cartography, to give insights in the quality of those web portals. The criteria applied are the quality of the visualization, the flexibility for exploring the images, the availability of georeference and overlay tools, and additional options as downloading and georeferencing. The key results are that, due to the lack of specialized tools, map galleries are not significantly different to their counterparts designed for images or books, in spite of their high quality scanning resolution and provision of metadata. In addition the way on which search engines such as Google work makes it difficult to differentiate low quality pages from properly built digital map collections. Exploring the best sites reveals the potential of web-based historical portals. It is concluded that, even in the best cases, the capacities online are not yet ready to substitute those available in GIS systems, or hard copy library retrieval systems.

**# KISS V. F., M. GEDE *Budapest A comprehensive database of cartographic heritage conference papers***

The 13 years of the ICA Commission on Cartographic Heritage into the Digital resulted in several hundreds of conference papers focusing on various topics of cartographic heritage. These papers cover all the important fields the commission is responsible for, but due to the huge number of contributions it is hard to find all the relevant papers to a specific theme.

The authors created a website where users can search in all the papers of the commission's conferences using various types of filters such as title or abstract text fragments, keywords or author names.

The website is completed with various statistics and graphs that give an overview how the main focuses of the conferences changed during the past years.

**SESSION 6**

**# GROPP H. *Heidelberg Mediterranean Cartoheritage - 2000 years of maps and graphs***

This paper will discuss maps and map-like documents who focus on the Mediterranean Sea, starting from the ancient and Greek and Roman times. The maps of the past will be seen with the eyes of today, but also with the eyes of intermediate periods and from different geographical and cultural perspectives. Among others will be considered the Tabula Peutingeriana, the Albi map, the so called Astrologer's map, various maps in the Ptolemaic tradition, and early modern maps. The objects of cartographic heritage such as maps, but also globes and sea charts are also related to more schematic diagrams and pictorial representations of parts of the earth. At the end of this spectrum there are graphs as mathematical objects as new geometrical sets of vertices and edges in a geometry independent of the traditional Euclidean geometry. For instance, the Tabula Peutingeriana is much more a graph than a map, and the Albi map is rather a schematic map than a map of the Mediterranean Sea in the usual sense. However, the focus of this talk will not be theoretical discussions about the classification of map-like objects. More interesting seems to be the evolution of maps through time (Peutingeriana or the Ptolemaic atlases) and, of course, the transfer of knowledge from East to West and from West to East. Of particular importance are events in the 8th century and in the 15th century where in different parts of the Mediterranean political and also religious developments lead to interesting transfers of also cartographic knowledge. To be short here,

just some key words such as Albi, Narbonne, Charlemagne in the first case and the synods in Italy and the event of 1453 in the latter case.

**# LAVINS I. *Riga The Baltic Sea Coastal Rivers in Ptolemy's "Geography" Al-Khwārizmī "Image of the Earth"***

The oldest work of Arabic geographers that has survived to our time is "The Image of the Earth" ("Kitāb sūrat al-ard"), written by al-Khwārizmī. The authorship of this work has been questioned throughout the centuries. The reason for these doubts might be the reference to Ptolemy that the work carries in its title, however, no researcher has made an attempt to compare information in the works of the two authors. Al-Khwārizmī in his manuscript "Image of the Earth" drew a quite precise outline of Eastern Europe, although in his work, as in Ptolemy's "Geography", the distance between the Black Sea and the Baltic Sea is reduced. He depicts all of the biggest European rivers. His depictions of mountains are the same as in Ptolemy's work. Dissimilarities can be observed regarding rivers: that is, regarding the rivers falling into the Baltic Sea. The report will be built on the comparison of Eastern Baltic river net depiction in the works of both authors.

**# SHCHEGLOV D. *St. Petersburg Deconstructing Ptolemy's map***

The aim of the paper is to propose a basic explanatory model of how Ptolemy's map, as described in his Geography, came into being and was internally organized. Accordingly,

this model allows us to improve our methodology for analysing Ptolemy's data. The starting hypothesis is that Ptolemy's map was a patchwork constructed from sources similar to those that have come down to us. These sources could include: (1) the works of the "mathematical" geographers in which geographical space was described in strict terms of latitudes, longitudes, straight-line distances, and geometrical schemes; (2) the works of the "descriptive" geographers where most of information was provided in the form of topographical descriptions; (3) the so-called periplus and itineraries, i.e. descriptions of the sea and land routes with distances in customary units;" etc. My contention is that the most reliable approach to analysing Ptolemy's map is not through comparison with modern map, but through comparison with other ancient sources. Based on such comparison, Ptolemy's map can be deconstructed into its individual constituents that were presumably inherited from his predecessors. This approach also makes it possible to reconstruct to some extent Ptolemy's working method—the way in which he combined contradictory pieces of information of different type and origin, fitting them together into a quasi-uniform map. How Ptolemy joined together different sources and reconciled contradictions between them can be shown by several examples. However, even after some of the constituent elements are identified, a significant, if not the largest, part of Ptolemy's information still defies consistent analysis. The presence of this elusive "dark matter" remains the major challenge the Geography poses to future researchers.

**10 May 2019 08.30-10.3030**

**# FILATOVA L., D. GUSEV, S. STAFEYEV** *Moscow, West Lafayette, IN Iterative Reconstruction of Ptolemy's West Africa Using Modern GIS Analysis*

The multifaceted and challenging problem of reconstructing Claudius Ptolemy's map of ancient West Africa from the numeric coordinate data and other information found in his seminal 'Geography' and visualizing the results in modern projections using popular and powerful GIS tools, such as ArcGIS and Google Earth, is addressed by the authors iteratively. We apply a combination of several old and new techniques ranging from traditional toponymic analysis to novel modifications of cluster analysis. Our hybrid human-machine method demonstrates that Ptolemy's information on West Africa is a compilation of data from three or more sources, including at least one version or derivative of The Periplus of Hanno. The newest iteration adds data for two more provinces of Ptolemy's Libya - Mauretania Caesariensis and Africa - to Mauretania Tingitana and Libya Interior investigated in an earlier, unpublished version of the work that the late Lyudmila Filatova had contributed to as the founder of our multi-year project. The surviving co-authors used their newest digital analysis methods (triangulation and flocking with Bayesian correction), completed the precision analysis, and took into account their recent finds on Ptolemy's Sinae (Guinea/Senegal, where Ptolemy had placed fish-eating Ethiopians). We discuss some of the weaknesses and fallacies of the earlier approaches to the problem. Our revised digital reconstruction will help modern history of cartography researchers and the general public improve their understanding of what West Africa was like in the distant past.

**# BUTEREZ C., M. VIRGHILEANU, C. TONCEA, A. STANCIU, C. ȚARUS** *Bucharest Revisiting the Romanian 'Plan Director de Tragere' collection (1916-1959)*

The first map series that covered all of the Kingdom of Romania and its newly joined territories after World War I was the so-called 'Plan Director de Tragere' (Army Shooting Map) collection. The basic map, created for military purposes, was drafted at a 1:20 000 scale, but all the original sheets were graphically transposed from previous sources and

continuously updated after 1924. Another series of maps of the same concept was made at a 1:100 000 scale, representing just over 100 sheets. Until 1959, when the Gauss–Krüger projection system was implemented by Romania for its new generation cartography, the 'Plan Director de Tragere' was used as the country's national map; the sheets at both scales were printed, reprinted, modified and updated in accordance to several administrative and land reforms, transportation developments and name changes. The result was a large but inconsistent cartographic collection of various designs and accuracies, though scholars have argued about its value as a resource in the historical-geographical reconstruction of the natural and cultural landscape.

Since a complete record of all the different map generations and editions is not known to exist, this paper aims to advance the knowledge of the 'Plan Director de Tragere' collection by thoroughly inventorying and documenting the identified map sheets that are scattered throughout Romania's archives. The investigation will be used as a basis for further expanding the geo-spatial.org eHarta project of digitally preserving and freely sharing old cartographic materials.

**# TSORLINI A.** *Thessaloniki Combining historical sources to find information about a map and its path over time.*

Historical maps are a medium to show how an area looked like in the past and to see its development over centuries; to learn about the history of a place or about important facts that took place in the area; to identify the different toponyms existed over centuries or to determine changes in countries' borders. In some cases, through the analysis of the map and its special characteristics or with the help of notes or inscriptions included on the map, it is possible to find the map's path over time; to whom it belonged and how it was found in a place. In this way, it is possible to get more information about the map concerning its distribution and the influence it has to the people.

An emblematic map of Greek Enlightenment and Greek Cartography is the Rigas Velestinlis' Charta, a twelve-sheet map engraved by Franz Müller and published in Vienna in 1797. The map is known for its historic, ideological, political, revolutionary content since

it was prepared by Rigas with the intention to awaken the Greek's national consciousness. It was printed in 1220 copies, but only a small number of them still exists and are kept in libraries or private collections in Greece and other places in the world. In 2008, the existence of two typologies with clear differences on the cartographic content of the map was revealed and later enriched by the discovery of variations on the two typologies. In an attempt to find out in which typology each of the known copies belong, we find out a copy of Rigas Velestinlis' Charta, bound in a book, in the Central Library of Zurich, Switzerland. The interesting part with this copy was the inscription written on the first page of the book.

In this paper, we analyse the Zurich copy of Rigas Velestinlis' Charta; its typology and characteristics; and through the inscription of the map, we will try to combine information from different sources to finally find out how this copy of Rigas Velestinlis Charta arrived in Zurich and to whom it belonged. The first results of this research will be shown in this paper as well as the evidence which led us to them. Through this research, we can get more information about the time period and the people who were influenced by Rigas ideology and ideas for Greek Independence.

**# TZIFOPOULOS I., E. LIVIERATOS** *Thessaloniki Mapping Cartouches in Rigas' Charta and Gazis' Pinax: The Elaborately Symbolic Narrative of a Map*

The design of cartouches on maps, since their appearance in the 15th c. and until their simplification in the 19th c., is an added artistic feature of the map, a synoptic and symbolic version, as it were, of the map itself. Although the artistic beauty of a cartouche's design is more or less self-evident, as is also its ornamental purpose, nonetheless its iconography is not as straightforward. The cartouche in Rigas Velestinlis' Charta, published in Vienna in 1797, and the cartouche in Anthimos Gazis' Pinax, also published in Vienna three years later in 1800, are extraordinary: they not only present an elaborate and symbolic narrative of the map according to their composers' ideas and goals, but they also enter into a dialogue about the nature and the goal of a map, i.e. a dialogue about the map's potential as a useful educative tool, a map's true didactic force.

**SESSION 7**

**# GEDE M.** *Budapest Matching old maps with reality*

Small and medium scale maps created before the emerge of accurate surveying methods

usually have large distortions. Georeferencing these maps means that they are forced into some modern projection by several control points, resulting a heavily squeezed, stretched and twisted map image. On a local

scope, however, these maps still preserve the spatial relationships of objects, therefore, using an appropriate control point set and local interpolation it is possible to define a quite accurate connection between the old map

and today's world.

The author developed a web based tool to visualise this connection. The viewer displays the old map and a modern web map parallelly. The user can define control points either manually or by importing a settlement list and performing a bulk geocoding on the list. The two maps can be linked i.e. moving/zooming one of them will move/zoom the other map, using the transformation defined by control points.

**# TIMAR G., E. BISZAK. *Budapest Projection analysis and georeference of Russian Schubert's „3-verst” topographic maps (late 1800s)***

A masterpiece of the topographic maps of Russia was compiled by Schubert in the second part of the 19th century. Its scale was one inch in the map to three 'versts' in the field (that's why this map series is referred to as '3-verst maps' or 'triverstn'iki' in Russian), in metric conversion this equals to 1:126,000. The base ellipsoid was the one of Walbeck. The map projection of this series, according to important items of the reference literature was Bonne. In our work, we give the best fitting geodetic datum parameters of the Walbeck ellipsoid. Besides, analysing the virtual map mosaic compiled of the original scanned sheets, we conclude that the real projection was Cassini-Soldner and not the earlier assumed Bonne. The map projection centre is the Pulkovo observatory, south of St. Petersburg.

**# GALAMBOS C. *Budapest Estimation of projection and datum metadata of the early country maps of Hungary***

The map projections and geodetic datums are estimated for four Hungarian historical, mid-scale map products; the maps of Mueller (1769), two versions of Schedius (1837) and Haidinger (1845). The final goal for each map is to provide a proper georeference and the distortion/accuracy analysis. All four studied map products depict the historical Hungary (the Pannonian Basin area), they consist of individual sheets, laminated together for library use. The sheets were scanned separately to avoid the lamination errors in georeference. Parameters of conic projections (standard parallels latitude, projection centre) were estimated using the angles between the meridians and distance between

parallels. The most simple 3-parameter datum transformation method was defined using only one central landmark. The georeference was carried out using latitude-longitude grid (if available) or identified control points (mostly cities). The horizontal reliability of these maps show remarkable improvement with the age.

**# NOBAJAS A. *Keele, Newcastle Towards the systematic vectorisation of historical cartography***

Many institutions have systematically digitised their cartographic documents, so there are now millions of maps which have been digitised and can be accessed on-line. The next step many map libraries have undertaken has been to georeference their digitised maps, so they can now be used within modern digital cartographic dataset. However, many of these applications still use the raster version of the maps, so they hamper the full potential working with historical cartography has, as it limits the analytical capacity and impedes performing spatial analysis. Even though there have been timid steps to overcome this limitation, the discipline seems to be struggling to advance into the next step, the systematic vectorisation of historical maps. Vectorisation is the process of converting pixel-based images –raster- into node or point based images –vector, which can then be queried or analysed by individual components. Vector based maps have a series of advantages when compared to raster maps, as they allow scale changes without a loss in detail, classifying map features by type or performing spatial queries just to mention a few. Therefore, by vectorising a historical map we are providing an unprecedented level of usability to it and allowing detailed inquiries to the information contained into it. Although there have already been some successful experiences in vectorising historical maps, they have been either expensive or not systematic, so there is scope to build upon these successful experiences and achieve a widespread method of vectorisation which can be applied to map collections across the world. This paper covers the advantages and drawbacks of vectorisation, while questioning whether automating the vectorisation process is currently possible, in the hope of starting a constructive dialogue between map curators and GIS experts.

**# SCHNÜRER R., L. HURNI *Zurich Detection of Pictorial Map Objects with Convolutional Neural Networks***

Some of the oldest maps, e.g. the Bedolina map, contain pictorial objects like humans or animals. Today, a large corpus of pictorial maps is available ranging from historic maps for seafarers and people of higher estates to contemporary maps for tourists and children. These maps are annotated with metadata, however information about the actual map content is largely unknown. In this work, we focus on detecting pictorial objects, i.e. realistically drawn illustrations, in digital maps with convolutional neural networks (CNNs), a machine learning technique for image processing.

For a first experiment, we retrieved 6200 images from the social media website Pinterest: half of them maps, half of them other images. Pictorial objects are included in 1500 of the maps. To separate them, we established two binary classifiers with Xception and InceptionResNetV2 while alternating image input options. Results showed that the accuracy is 96-97% to distinguish maps from other images, whereas maps with pictorial objects were correctly classified at rates of 89-92%.

In a second experiment, we concentrated on a particular pictorial object type, namely sailing ships. For this, we collected digitized maps, mainly from the Middle Ages and Renaissance, from libraries and marked bounding boxes of 3200 ships. To determine the box coordinates, we compared Faster R-CNN and RetinaNet while adjusting anchor scales and examining configurations for small features. As results, we obtained an average precision of 32% for Faster R-CNN and of 36% for RetinaNet.

With these experiments, we like to provide training datasets and first baselines to discover pictorial objects on maps. Future work may increase the effectiveness by implementing custom CNN architectures. Nevertheless, our work may already be used to identify maps, especially pictorial maps, when crawling the web and to enhance the advanced search of digital map libraries by adding sailing ships as a filter.

**SESSION 8**

**# MARKOVIC N. *Madrid The Art and the Power of Maps: An Anthropology of Emotional Cartographies***

The concept of 'Emotional Geographies' has been coined by geographers as 'a concern

with the spatiality and temporality of emotions' (Davidson J, 2007). Emotions have been acknowledged not as individualized, but as intersubjective – social and cultural. Since the mid 1990's, the geospatial technologies

have acquired more humanized characteristics (Pickles, 1995), such as mapping emotional responses to space (Gartner, 2012) and feelings (Pocock, D. 1984). But, 'Emotional Mapping' goes beyond the georeferenced

**10 May 2019 15.00-16.00**



emotional states in a certain geographic area. By merging technology, science and art, theory and practice. As such, this reflexive and participatory methodology, as Nold argues, “creates a tangible vision of places as a dense multiplicity of personal sensations, which we are not normally aware of” (Nold, 2009). Nevertheless, little cartographic efforts have been made in that direction due to the challenges in data collection and representation of emotions. (Griffin & McQuoid, 2012). How 'Emotional Cartography' has been linking Spatial, Emotional, Participatory and Digital Turns? What is the role of landscape in the studies of emotions? How landscape-rooted affective elements can be spatially represented? Has Affective Cartographic Turn provided new models for Critical Heritage Studies? The paper addresses these questions as it traces various mapping approaches to landscape-emotion research. It explores “Emotional Cartographies” firstly by reviewing how it is practiced and thought about. Secondly, the mapping practices are qualitatively analysed through ethnographic study – observation, interviews, and anthropology of emotions. The current research draws on two datasets: first, a corpus of “Emotional Cartographies”; second, ethnographic data and narrative on emotional mapping projects in Spain. This will allow conducting further analysis, and making broader arguments not only on the challenges of spatially representing emotions, but also the potential of those cartographies in the re-subjectivization of space.

# PANECKI T., B. SZADY *Warsaw* **Digital paradigm in historical cartography: challenges and limitations**

It is no doubt that the world of humanities goes digital. Digital tools and methods are intrinsic to high quality studies within humanities since they facilitate text recognizing and annotating thusly providing its structured version for scholars. Similar can be said about historical cartography, which has been being affected by digital tools for at least several

years. Digital processing such as georeferencing, databases and ontologies development, web map applications and metadata are becoming a standard in historical cartography studying. One could ask however: what does it mean to apply full array of digital tools and methods towards historical cartography, and – what is even more important – how does the so-called “digital paradigm” change methodological foundations of such works (if so)? Authors’ aim is to indicate and describe most important “digital paradigm” features within historical cartography based on the experiences of digital and spatial humanities, especially textual analysis, computational linguistics and historical GIS. Such features include not only media shift from analogue to digital form, but touch the core of the research process by making it verifiable, modularized, multi-accessible and algorithm-driven. The most important consequence though is the change in disseminating research results. In the “digital paradigm”, scientific work becomes a permanent process, rather than product. Data and knowledge can be collected and published at the very same time leaving a lot of space for users to review the correctness of scientific process. Final question is whether this shift towards “digital” is a real paradigm change like T. Kuhn describes in his *Structure of Scientific Revolutions* or it is just a simple consequence of applying digital tools towards old maps such as GIS or databases?

# PAZARLI M., N. PLOUTOGLOU, K. STAIKOU, E. DANIL *Thessaloniki* «**The Use of Maps and Cartographic Material in Out of School Education for Children and/or Adults in Refugee Camps**». **A training program of Cartographic Heritage Archives about the use of maps and cartographic heritage in the management of refugee flows on an educational and pedagogical level.**

Since 2015, the refugee/migrant crisis in Mediterranean area has been a major concern of the European geospace. Among the

various critical issues, apart from the economic, political or historical aspect of this major humanistic crisis, is the management of refugee flows on an educational and pedagogical level. The Regional Directorate of Primary and Secondary Education of Central Macedonia, Greece, coordinated the Erasmus Plus KA2 program “Managing the Refugee and Migrant Flows through the Development of Educational and Vocational Frames for Children and Adults – XENIOS ZEUS” (2016-18), concerning the ways the implicated agents in Greece, Italy and France are dealing with the refugee and migrant flows on an educational and pedagogical level and the exchange of good practices.

The General State Archives of Greece-Historical Archives of Macedonia-Cartographic Heritage Archives (CHA) offered the training program “The Use of Maps and Cartographic Material in Out of School Education for Children and/or Adults in Refugee Camps”, addressed to teachers, educators, researchers, volunteers, and other interested persons or institutions, taking action in non-formal educational programs for children and adults refugees inside the refugee camps.

The program was designed to bring the participants into contact with modern and archival cartographic material, in order to understand the communicative role, functions and uses of maps, to evaluate and find creative and attractive ways to use the available cartographic material. The participants had the opportunity to enrich their geospatial knowledge and to understand the migration and refugee flows in geospace, in present and past times, using cartographic heritage. The map, old and modern, was also proposed as a tool in the educational process for organizing activities for children and/or adult refugees.

This project refers to the CHA training program, the educational purposes, its structure and implementation, as well as to the gained experience from the implementation of the program.

For the full texts see:

C. Boutoura, A. Tsorlini, E. Livieratos (eds.), 2019. Proceedings of the 14<sup>th</sup> ICA Conference *Digital Approaches to Cartographic Heritage*. Thessaloniki 8-10 May 2019 Thessaloniki: AUTH CartoGeoLab, ISSN - 2459-3893, pp. 307.

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