Computer Graphics - Literature survey 1

Raj Krithika Balakrishnan

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1 Title :

1.1 Primary Paper:

TITLE - Visualization of cultural Heritage collection data : State of the art and future Challenges

AUTHOR - Florian Windhager, Paiolo Federico, Gunther Schreder, Katrin Glinka, Marian Dork , Silvia Miksch, Eva Mayr

Source : https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=arnumber=8352050

1.2 Secondary Paper:

TITLE - The Evolution Of Cultural Evolution

AUTHOR - Joseph Henrich and Richard McElreath

Source : https://xcelab.net/rmpubs/henrich

2 Abstract : (Paper is about)

This Primary Paper study examines the current status of data visualization for cultural heritage collections and forecasts upcoming difficulties. The authors examine several techniques for showing cultural heritage data, such as interactive visualizations, virtual and augmented reality, and 2D and 3D visualization. The significance of user-centred design and the necessity of data integration and interoperability in cultural heritage visualization are also covered in the article. The writers also go over contemporary issues in the sector, namely the lack of data accessibility and the demand for simple tools for viewing and interpreting cultural heritage data. In order to foster a greater awareness of and interaction with cultural heritage, the study finishes by stressing the possibility for future research in this field and the significance of displaying cultural heritage data.

In Secondary Paper, the authors examine how cultural practices and beliefs have evolved over time as they investigate the evolution of culture. The authors examine factors such as conformity, conformist bias, and the significance of conformist transmission that contribute to cultural transmission processes and cultural change. They argue that cultural evolution has influenced both the development of Human communities and the history of human evolution.

Both the papers focus on the evolution of cultural evolution, as well as the visualization of cultural heritage data and They highlight the importance of understanding these fields for gaining deeper insights into related phenomena.

3 Why is this relevant or important :

This paper is more important for the computer Graphics field as it talks about 2D 3D technology. Mainly It discusses the heritage of data and highlights the challenges facing the world . The report can assist scholars and practitioners better understand the state of the art in cultural heritage data visualization and identify topics for future research and development by integrating existing research and offering insights into the present status of the field. Using this knowledge, improved visualization tools and methodologies can be created to aid in the interpretation, preservation, and distribution of cultural heritage holdings.

4 Describe the paper :

In this paper Culture is referred to as that complicated whole which comprises knowledge, belief, art, morals, law, tradition, and any other capabilities and habits and it encompasses the full spectrum of valuable items and ideas, including the everyday conventions and practices that make up how we live as a civilization. In functional aspect CH comprises the whole artful and useful assets that enable and refine collective reproduction.

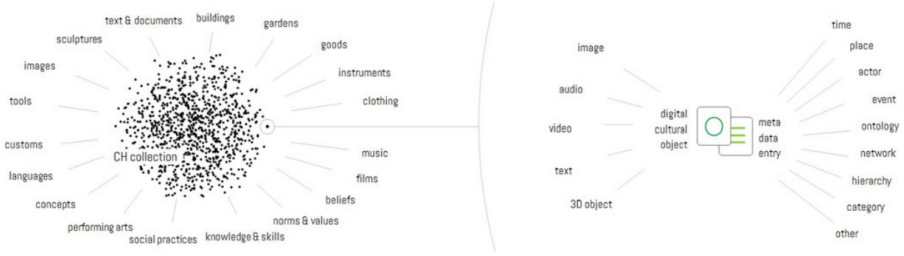

Figure 1: In the above image we can able to see the types of cultural objects and assets in the (picture left) with tangible CH at the top and intangible CH at the bottom, (Right picture) second picture shows the structure of CH object data which are digital cultural object eg: image,audio,video,text,3D object and metadata entries in the opposite side of the image

The special difficulties they present in the creation of visualization and interaction techniques explain why CH data are relevant from a visualization standpoint. When compared to other data sets, CH collections data stand out due to their extensive and frequently heterogeneous metadata, which are linked to a wide range of object categories. There is a methodology which is demonstrated in the way of survey and The survey's primary focus is on CH collection visualizations that are not limited to any particular object type. As a result, it equally took into account interfaces to collections of visual artefacts like paintings, drawings, and sculptures as well as text, audio, or video data that record physical or intangible CH assets—as long as they might be represented by visual surrogates or graphical abstractions. Three criteria helped to focus the investigation by restricting this wide search space The Authors concentrated on methods and interface layouts that make use of InfoVis principles to describe CH objects like 3D rendering. It is included only in the cases of hybrid use of SciVis and InfoVis methods . It then concentrated on strategies that have a known connection to or applicability to institutions or data related to cultural heritage. This constraint constrained the search field to the cultural sector, excluding InfoVis interfaces to, for instance, personal photo or music collections, or scientific text publications, but it creates an intersection to visual text analysis in the digital humanities space. In order to classify the data for our evaluation of InfoVis techniques to CH gathering, we created a classification scheme. It combines inferential bottom-up categorizations produced by an open coding methodology with top-down classification methods. The end result offers a conceptual framework that is adaptable to discussion and further development. When applicable, we draw analytical categories from taxonomies that already exist in the InfoVis and CH domains, which we then modify to fit the requirements of the target domain. As a result, the initial categories are organised according to the three axes of data, users, and tasks concerning visual activities for information gathering, visual encoding methods for both temporal and nontemporal components of data acquisition. The following discusses each

of these categories, which have been given various colours to make them easier to distinguish.

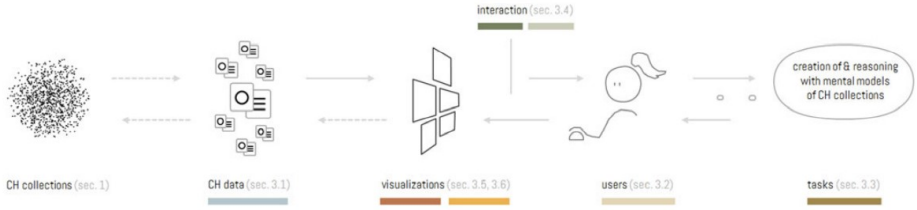

Figure 2: Schematic lineup of a visualization system in CH data domain with annotations and colours of the survey's main categories

5 Data :

Two sorts of data can be used in the visualization of CH collections: the data that makes up the digital cultural object and the accompanying metadata. The scope, quality, and character of the metadata might vary across various collections, contexts, organizations, and domains and can describe a wide variety of data related to the CH objects. As a result, authors must use a uniform and comprehensive metadata model to categorize the appearances of metadata. Among several standardisation EDM (Europeana Data Model) is one of the most mature effects. Both an object-centric approach and an event-centric approach are covered by the EDM when describing CH objects. By concentrating on the object's static features, the object-centric method makes it possible to describe an item's creator, creation date, object kind, and current position. However, it can be required to include not just the attributes of the object itself but also the properties that are associated with other object-related entities in order to reveal a more thorough description of the object context. We include the following categories to account for these elements: actor (individual or group), time, place, event, and ontology (in the event that the visualization incorporates entities from knowledge organisation systems).The event-centric approach also seeks to create more complex relational structures, such a network or a hierarchy is rarely supported.

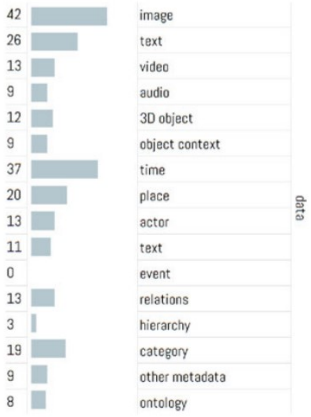

Figure 3: Distribution of supported data types in the survey's sample

6 Distribution of supported Data types:

Users: The target user is a crucial consideration in the design of CH visualizations: Users' expectations for and interactions with a visual interface will be influenced by their prior knowledge, experiences, and interests. For this classification, authors assess the InfoVis systems in light of the system's intended users and objectives.Digital CH collections' target audiences range widely.The CH collections can offer relevant and engaging information to a wide range of people, including museum curators, humanities academics, avid hobbyists, and members of the general public. As a result, there are numerous different classifications of users based on their topic expertise, technical proficiency, and use motivation]. We separate two main types of users experts and casual users in order to categorise and rate CH visualizations.In contrast to casual users, who seek personally relevant information in everyday contexts, experts include all individuals with a professional or scientific interest in CH data for the design of InfoVis approaches. Visitors can engage in a variety of information activities that have been set by an information provider to interact with a digital collection and examine it across the outlined degrees of granularity

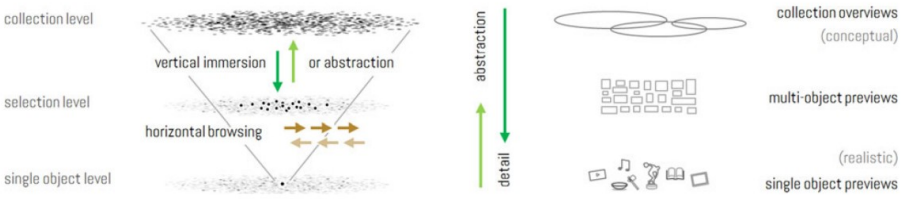

Figure 4: In the above image it shows the information activities for CH collections like vertical immersion or abstraction in green indicator and horizontal browsing as brown , Granularity levels of object collections in right side from the overviews utilizing abstractions to realistically encoded object previews.

7 Visualisation methods :

7.1 Temporal :

Timelines (1D) : Timelines are the simplest solution for mapping time to space in a linear, one dimensional. Timelines are often utilized as linked views in combination with other visualizations for temporal navigation.

Time as One of Two spatial Dimensions (2D) : Mapping time linearly to one of two spatial display dimensions and utilizing the orthogonal display dimension (y-axis) for encoding another data aspect

Time as one of three spatial Dimensions (3D) : when the interface makes use of three dimensional Visualization technique , temporal data aspects can also be mapped to one of three dimensions .

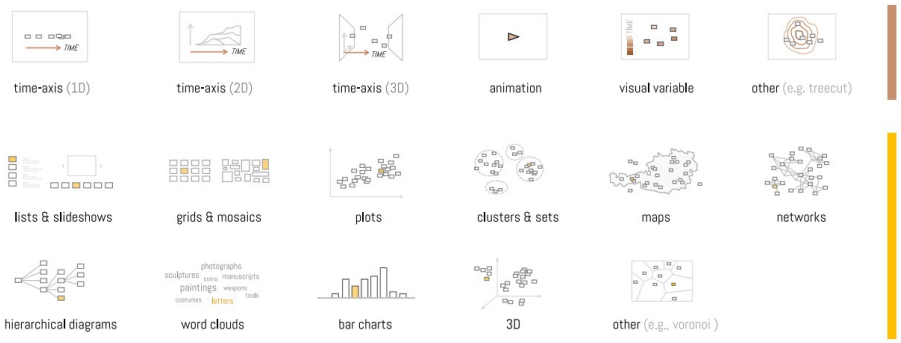

Figure 5: Surveyed visualization methods to encode temporal data aspects and methods to visually encode non-temporal aspects of CH data collections

7.2 Non - Temporal Visualization methods :

List and slideshows : Horizontal slideshows or vertical lists arrange object collections in a linear sequence. Grids and mosaics : Using line breaks , line arrangements turn into grids and mosaics which arrange multi object previews in multiple rows that raise the item screen ratio

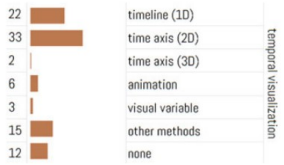

Figure 6: Distribution of Temporal data

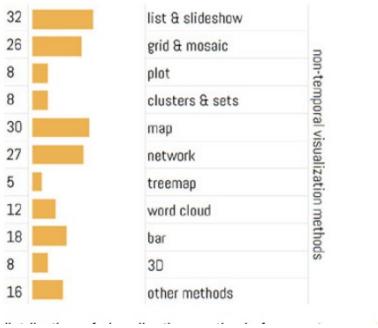

Figure 7: Distribution of non-Temporal data

8 Interest in CH visualization :

The usage of InfoVis technologies, which provide efficient ways to interact with these data and aid in making sense of enormous data collections, was driven by the CH data's quick expansion. Here we can say that Interest in using InfoVis techniques to CH collection data has grown over time and is likely to do so in the future due to the ongoing rise in data that is available and the development of multidisciplinary research competence in the relevant domains. As shown by the survey to date, recent advancements in the field of CH representation have inspired a wide range of visualization techniques, which are starting to come together to form a connected field of study with its own issues and difficulties. A discussion of newly necessary design concepts and methodologies has provided solutions to these fresh difficulties. We examine a few of these viewpoints that come up in the discussion between digital humanities, cultural sciences, and information visualization in the paragraphs that follow. They partially reflect

early InfoVis innovations, and we see them as important voices illuminating potential future requirements for sophisticated visualization design in the CH data space.

When we talk about the concept of criticality, we're talking about thoughts and design tactics that can enable different groups in the humanities, arts, and CH achieve particular epistemic norms. Some of these criteria largely intended to encourage interpretive narratives and critical assessments of authoritative representations and its assumption rather than preventing unverified or realistically naive portrayals of CH issues, facts, and subject subjects. We mainly see two options: boosting users' critical (data and visualization) literacy skills while simultaneously enhancing the amount of critical self-reflection on the part of visualization designers. Additionally, by introducing contextual entities and relationships between them, including relationships between objects and agents, that took part in an event at a specific time and location, the event-centric approach seeks to construct richer relational structures, such as a network or a hierarchy.

Facts of uncertainty How to handle unclear data already falls under one of the field's standard exercises in visualization research . The issue of uncertainty is frequently brought up when dealing with CH data in the context of digital reconstruction of CH sites and 3D visualization.We observe a dearth of conversation on the same level when it comes to InfoVis of CH collections. Using historical markup, CH visualizations can be annotated and placed into the larger sociopolitical context of the collection's past and present. The rich representations of future interfaces can also make the exchange of ideas with other societal realms, such as politics, technology, economy, religion, science, or daily life, apparent. In this regard, contextualising and integrating data can be a step toward broadening the concept of generosity and fusing the complex domains of Socio-cultural meaning production and their dynamics with CH investigation and interpretation.

9 Summary :

To the conclusion author's looked at and evaluated the state of the art for visual interface design for CH collecting data in this paper.From the perspective of InfoVis, CH data collections present a particularly difficult but also exciting study scenario. The great diversity of item types and their rich and heterogeneous metadata, which are frequently linked to further information and materially rich content and must be made available to diverse users with various skills and goals, present new obstacles.

For the purpose of capturing the state of interface and visualization design at the moment, they examined 70 CH visualization solutions using a custom taxonomy and looked at this design space's organizational structure and considered current issues and hot topics from a broader InfoVis and humanities perspective. thus they anticipate contributions with relevance for various groups, including scientific, educational, intercultural, informal, and public domains of cultural thinking and communication, from the future development of its technical standards. contribute to a group's consolidation . Visualizations of and interfaces to CH data are, in our opinion, independent modern cultural objects. moreover author's think of them even more as epistemic objects because they form a part of our current arsenal of tools for researching, interpreting, and communicating the past. must be amenable to interpretation and criticism. The categories and guidelines that have been provided should help this project move forward. At the same time, They wish to underline the requirement for more thorough and thorough reviews that must support the process of interpretation and criticism. Believe that such a balanced approach presents the chance to advance and deepen this field of study, as well as to connect a wide range of disparate ideas visualization endeavours as a trans disciplinary research domain