## DIGITAL HUMANITIES



In order to give the praxis of our research a theoretical shape, we use the fundamental steps for the construction of a digital humanities work indicated by the text Digital\_Humanities. We will use in particular chapter 1 "Humanities to digital humanities".

Curation, analysis, editing and

modeling comprise fundamental activities at the core of Digital Humanities:

CURATION is the selection and organization of materials in an interpretative framework

ANALYSIS, and now I'm quite quoting, "refers to the processing of data: close reading of data - and distant reading of data, this kind of process is often conjugated with visualization in order to give graphical legibility to analytical results

EDITING: the parsing of the cultural record in terms of question of authenticity, origin, transmission, relationship or production. It's the means by which an argument takes shape and is given form.

MODELING hightlights the shape of arguments expressed in information structures and their design: a model by means of which shape is conferred upon a given set of cultural contents (such as, in this case, the concept of authorship, the ordering by artist but, above all, the concept of relationships between materials, artists and artworks). THE HOW OF THE WHAT.

From Schnapp Digital\_Humanities p.29



INFRASTRUCTURE and NETWORKS "Each of these areas of activity curation, analysis, editing and modeling - is supported by the basic building blocks of digital activity. But they also depend upon networks and infrastructure that are cultural and institutional as well as technical. Servers, software and system administration are key elements of any project design."

From Schnapp Digital\_Humanities p.31

The problem is simple and fundamental at the same time, and it's technical and also administrative: on which server will the researchers upload the data during the research and in the future? Who takes care and will take care of its maintenance and control within a public institution that has to resort to external funding and technicians to carry out this kind of work?

## VERSIONING

The nature of cultural projects carried out digitally is highly experimental, as are the IT techniques used, which must be as flexible, changeable and adaptable as possible over time for constant classificatory re-editions (not only cultural one, but technical too).

## FAILURE

"Building on a key aspect of design innovation, Digital Humanities must have, and even encourages, failures". The research can benefit from failure, because of the process it's more interesting than the product itself. Interpretation, that is in some way the versioning research aspect, it' more intriguing than a definitive and stable edition.

All very true, if we leave aside the problem of costs



So in this top down description we have introduced INSTITUTIONS: now, in this second section let's turn our attention to the overview on institutional topics.



These have been the institutions involved in the work over the years:

Let's start from the origin, i.e. funding, considering that Italian public institutions, such as archives, museums and libraries in general, have no possibility of funding anything new motu proprio.

The three institutions you see, Mart,

Museion and Fondazione Bruno Kessler, are from Trentino and have benefited from funding from a foundation of banking origin, Caritro, which launched a network call for cultural institutions in Trentino.

Reading on the CARITRO web page, Foundations are "intermediate bodies between citizens and institutions, with a strong territorial vocation, attentive to the heritage of values of local communities, promote the well-being of communities and contribute to the development of the country". It sounds good, even if it's really a tax relief goodness, but in any case essential for this kind of project.

We have talked about Mart and Museion, they are public institutions, contemporary art Museums but we have not yet mentioned a third, private institution that is fundamental to this work: the Bruno Kessler Foundation.

"The result of more than half a century of history, through 11 centres dedicated to technology and innovation and to the humanities and social sciences, FBK aims to achieve excellent results in the scientific and technological field with particular regard to interdisciplinary approaches and the application dimension.

Fondazione Bruno Kessler acts as a scientific and technological hub, its premises and platforms hosting a lively ecosystem of co-located ventures, spinoffs, projects and training opportunities."

## https://www.fbk.eu/en/about-fbk/

Fondazione Bruno Kessler acts as a scientific and technological hub, its premises and platforms hosting a lively ecosystem of co-located ventures, spinoffs, projects and training opportunities. The result of more than half a century of history, through 11 centres dedicated to technology and innovation and to the humanities and social sciences, FBK aims to achieve excellent results in the scientific and technological field with particular regard to interdisciplinary the application approaches and dimension.



Everything that came from the results of the art-historical research was discussed with the IT researchers of the Fondazione Bruno Kessler who dealt with these kinds of problems arising from curation, editing and so on. Schnapp Digital\_Humanities p.28

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The actors in this work have been many:

various types of personnel from within the museums and the FBK's DH Department, from researchers and IT technicians to press officers and graphic designers.

There were people dedicated to

maintaining relations between the different institutions, people dedicated only to administrative tasks, and to maintaining relations with external entities, such as the owner of the collection and the curator.

Crowded scientific committees, not always easy.

Many people with whom to navigate in good and bad waters, some relationships to be forgotten, but fundamentally the need to put in place not only professional knowledge but also relational skills, which are fundamental for working in a team.

Especially where research is deep and has to be produced by several hands, with very different heads and hands, such

as an art historian and a computer engineer, the real ability is to find a common language, real oxygen to face the unknown.



When things go well, quite well, as in our case, when they do not concern the project failure process, the judgments of the technicians are benevolent and self promoting:

I'm quoting Sara Tonelli, DH chief department

"We adopted an approach known as

co-design, in which the design of the online system its and subsequent implementation were managed in a participatory way, actively involving the staff of the two museums and asking them to provide regular feedback on the proposed technologies. We worked in parallel with the documentary collection and organisation activities carried out by art historians Valentina Russo and Cecilia Scatturin, with whom we discussed how to bring out elements such as the connections between the works and artists in the ANS collection."

It's difficult, terribly tiring, but it's the interesting part of this kind of work.



The general public was given a first taster of the new platform during the European Commission's Researchers' Night dedicated to "The five senses of research", held in Trento on 25 September 2015. With this preview, edited by FBK.

On this occasion, the museums organised an activity to verify the

degrees of affinity between the participants' visual perceptions.

A second initiative was held at Museion on 27 November 2015, for the Long Night of Museums of Bolzano.

It was a game: PAGANS (Playful Art: a GAme oN Similarity) a playful activity to be performed by pairs of users in order to collect similarity judgments about artworks. The final goal of this task was to have indicators concerning how people perceive artworks and how they judge their similarity. The DH department were also interested in comparing such judgments with the opinion of art curators, and see whether users' contribution can be integrated in the arrangement of a virtual or physical exhibition in view of a crowd-curation approach (Ridge, 2014).

The final results of the project were presented at Mart, in Rovereto, on 15 April 2016 at the inauguration of the exhibition Materiale immateriale curated by Nicoletta Boschiero, Valentina Russo and Cecilia Scatturin. Through the objects exhibited, the exhibition provided a material counterpart to the immateriality of research and of the items explorable through the online portal.

and now, from 2020 a new project, Connections manent, again funded by the Fondazione Caritro, has enabled a new phase of implementation of the VVV platform in collaboration with the University of Trento.



We present PAGANS (Playful Art: a GAme oN Similarity) 1 a playful activity to be performed by pairs of users in order to collect similarity judgments about artworks. The final goal of this task is to have indicators concerning how people perceive artworks and how they judge their similarity. We are also interested in comparing such judgments with the opinion of art curators, and see whether users' contribution can be integrated in the arrangement of a virtual or physical exhibition in view of a crowd-curation approach (Ridge, 2014).

https://dh.fbk.eu/2013/07/vvv-verbovisuale-virtuale-la-piattaforma-di-ricercainterattiva-dellarte-verbo-visuale/

We are in charge of the technical implementation of the online platform. In particular we collaborate with researchers in arts and digital archives to design possible exploration paths through the collection, merge and harmonize metadata coming from MART and MUSEION databases, implement advanced functions in the platform for expert users.

Besides, we implemented an interactive game for collecting similarity judgments about the artworks in the collection, in order to investigate how different users perceive visual similarity and how this can help curators build possible exhibition paths. So far we have collected more than 1700 similarity judgments, which will be used to analyse possible correlations between users' and artworks' characteristics and perceived similarity. This game is called PAGANS (Playful Art: a GAme oN Similarity) and it won the "Digital Humanities Award 2015" in the category "Best use of DH for fun". The project and the verbo-visual artworks have also inspired a dance performance

by Asd Artedanza. See some pictures of the performance are displayed on the right-hand side of the page. A video is available on our Youtube channel: https://www.youtube.com/watch?v=ZGIL qz4Gs8A.

https://dh2016.adho.org/abstracts/258

Collecting Judgments on Artworks Through a Similarity Game We present PAGANS (Playful Art: a GAme oN Similarity) 1 a playful activity to be performed by pairs of users in order to collect similarity judgments about artworks. The final goal of this task is to have indicators concerning how people perceive artworks and how they judge their similarity. We are also interested in comparing such judgments with the opinion of art curators, and see whether users' contribution can be integrated in the arrangement of a virtual or physical exhibition in view of a crowd-curation approach (Ridge, 2014).

PAGANS foresees the involvement of a pair of users at a time, who play in parallel. Each of them plays the same game independently: similarity was not explained and participants were asked to follow their intuition. A final score, presented as a sort of "aesthetic affinity score", is obtained by comparing the two judgments and how much they overlap. The game could be played online, but so far the collection method has been tested in real-world scenarios, where both players are physically in the same place and one researcher is available to give feedback after the completion of the activity.

The game itself is as follows: a virtual card representing an artwork is given (the card with a red pin on the right of the table in Fig. 1), while a set of other 10 cards is displayed to the user. (S)he has to drag and drop on the round target the cards in order of similarity to the given card, until all images on the table are ranked.

Fig. 1: Game interfaceFig. 1: Game interfaceWhen both players have completed the task, they enter information about gender and age, and then the system shows the

dashboard displayed in Fig. 2. The Pearson's, Spearman's and Kendall's coefficients (Hauke and Kossowski, 2011) are three metrics that measure with slight differences the players' agreement on the similarity judgments (the higher the value, the higher the agreement). This score is presented to the players as their aesthetic affinity score. The best affinity is reached when the players choose the same ranking, since there is no 'gold standard' order. Players' affinity is also compared with the ones displayed on the right of the dashboard: the average score obtained by other pairs previously participating in the game ("Overall correlation"), the average agreement among all male players, and that of female players. Another useful information is the "Rank switching trend":

for each artwork to be ranked, the picture shows if the two players put them in the same order (straight line) or if they switched some positions.

Each picture displayed in the game was pre-processed with the LIRE tool 2 that extracts automatically image-related features such as color and shape. These features are used to provide information about the similarity judgments provided by the players, specifically if similarity relies more on color or shape information. Finally, the system outputs on the fly a network, where each node is one of the artworks in the game and the distance from the central node (i.e. the pinned card) is proportional to the average rank assigned by the two players.

Fig. 2: Players dashboard

PAGANS was presented during Researchers' Night 2015 in Trento (Italy) as a game for pairs of players, allowing us to collect around 170 game sessions in few hours. The game environment proved successful in engaging players also thanks to some gamification strategies. For instance, every hour the system automatically displayed a message assigning two free museum entrances to the players currently involved in the game. Besides, we kept track of the best affinity scores, and we identified the "winning pair" of the night. This boosted competition, with players trying to beat the highest score.

The goal reached with this first experiment was two-fold: on the one hand, some verbo-visual works from "Archivio di Nuova Scrittura" (Ferrari, 2012) were displayed in digital form for the first time, reaching an audience that would not necessarily see them in an exhibition. Since the game included four possible similarity sessions, around 50 artworks were shown. These works are usually kept in the archive of MART 3 and MUSEION 4 museums, not visible to the public. A second advantage of PAGANS is that we were able to collect in a short time several similarity judgments, which will be used to investigate which features related to images and possibly to persons' age and gender correlate best with similarity.

These analyses are currently in progress.

Bibliography Ferrari, D. (2012). Archivio di Nuova Scrittura Paolo della Grazia. Storia di una Collezione/Geschichte einer Sammlung. Silvana Editoriale. Hauke, J. and Kossowski, T. (2011). Comparison of values of Pearson's and Spearman's correlation coefficients on the same sets of data. Quaestiones Geographicae, 30(2): 87-93. Ridge, M. M. (Ed.). (2014). Crowdsourcing Our Cultural Heritage. Ashgate Publishing, Ltd. Notes 1. https://youtu.be/PgiZl6noPns?t=5m29s 2.

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http://www.lire-project.net/
3.
http://www.mart.trento.it
4.
http://www.museion.it
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When things go well, as I have just said, and I'm quoting once again

"Technology is conceived not only as a means of reorganizing and virtually unifying the two portions of the Archivio di Nuova Scrittura (ANS) held by MART and MUSEION, but also as a true cognitive and exploratory modality, through which new associations between the catalogued elements can emerge, providing keys to interpretation not foreseen by the curators, identifying peculiarities of the collection as a whole according to the paradigm of distant reading.

The result is an online tool that, rather than a platform, is a virtual environment for exploring and navigating the archive."

And here we finally come to the interesting part of the collective work: the paradigm shift.

In this case the concept of distant and close to, on which it's based the project, it's the central topic core.

Distant reading published in 2013 by
Franco Moretti is considered an interesting methodological model within the history of letterature, a change of paradigm I suppose. In some way this books constitues an important, probably not so counscious source, of our research.

Franco Moretti with an experimental attitude aims to bring literary history closer to the human sciences, by applying tools and models developed in other research fields to the study of literature: graphs of quantitative history, maps of geography and family trees of the theory of evolution. Distance shows less details, true: but it makes understand relationships, patterns, shapes better.

But, quoting Moretti: what would happen

if literary historians in turn decided to "shift their gaze" "from the extraordinary to the everyday, from exceptional events to the great mass of facts"? What literature would we end up finding in the "great mass of facts"?

It is a question that all historians have in common, we find it in Braudel in 1941, in Pomian in 1979, it applies to historical events as well as to art historical and literary historical events of course. We have anticipated the centrality of the theme through the words of Jeffry Schnapp at the beginning of our lessons for the digital humanities: different methods and probably different tools, looking from near and looking from far. Well, we took a chance, we have tried to have both in the same tool! DISTANT AND CLOSE TO GAZE, an object in its contest. A gaze ecology. And probably some of you is remembering Susan Sontag.

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Here we are with network analysis applied to an artist and to the entire collection, from authorship to a relationships ecology



We felt it was essential to adopt a method of observation that was both attentive to detail and aware of the broader horizon in which each experience is embedded In this case From very close, secret, hidden, fragile point of view, that of Amelia Etlinger



A method of observation that was both attentive to the maximum detail and aware of the broader horizon in which each experience is embedded: even more so in the specific case of verbovisual operators, poets and artists who usually worked together on projects and actions. As we have seen last lesson.



To realize such ambizious landscape Some key principles are necessaries, agreed between historians and computer scientists.

First of all, FLEXIBILITY, an element that is necessarily limited in 'real' archives, but which is often not fully exploited when creating digital archives, tending to reproduce the limitations of paper versions. At VVV we looked for solutions that would allow the greatest possible flexibility both in the search for materials and in the way the results are displayed.

The immateriality of digital technology makes it possible to create orders and relationships of proximity that would otherwise be impossible between the shelves of an archive or in the repositories of a collection. Everything can be virtually moved without creating disasters. The new orders, or impossible orders, are called formats and pertain to the interpretation of data.

A second thread is that of CONNECTIONS. ANS is an exemplary

case in this sense: the archive shows direct links between authors, in the case of works by several artists, but also indirect links when works by different artists have been exhibited together. In order to enhance these connections, we have chosen to adopt forms of visualisation based on grids or networks. Networks have become a familiar and understandable way of representing information: thanks to the spread of social networks, we have learned to see people as nodes in a network, connected by bonds of friendship and interaction.

The networks that represent ANS data in the VVV platform follow a similar principle: nodes that have more connections to each other are arranged close together in the network, and have more in common than distant nodes.

The third principle is that of SIMPLICITY, a criterion often forgotten by technology developers and academic scholars, but increasingly at the heart of Digital Humanities studies. Indeed, platforms such as VVV's must maintain the right balance between the complexity of the information provided and the richness of the archive, returning it to users in an accessible way. The aim of the co-design was precisely to find ways of exploring and visualising that would not distort the richness of the ANS archive, but rather enhance it, while concealing the technical complexity necessarily required for a platform of this kind.



To conclude our topic on institutions and their co-design let's have a final technical explanation on network analysis, as if we are talking with FBK.

## **VIDEO TRANSCRIPTION**

DEREK MILLER: Gephi is a network analysis tool. It's an open-source tool that allows you to look at connections among, say, people.

You might know about social networks, such as Facebook.

You can visualize relationships on Facebook by taking each person

and plotting them in space, and connecting

people who are related to each other, through kinship or friendship,

with a line drawn between them.

In the language of networks, we call the people nodes,

and we call the connections between them edges.

And Gephi is a tool for seeing the shape of a network.

It also offers rigorous mathematical analysis

so you can understand better who's most

central to your network or how far apart any two individuals are. It's an open-source tool. And I chose it in part because it's opensource. It's technically still in its beta version. But it's also graphically based. Some of the other network tools require programming and then spit out a result. And it's hard to tell the interaction between input and output. Gephi allows you to see what you're doing in real time. It's also relatively easy to use, with a good community online.

So it works well for large data sets too.

There are other open-source tools, such as Cytoscape.

You should definitely explore what might

work for you if you're

interested in analyzing networks.

I want to show you now how to make a network graph with Gephi.

I'm going to use a wonderful open-source data set that I've been working with.

It's from the New York Philharmonic's digital archive.

And here you can see the website for the archive itself.

And then a GitHub page that has their data set on it.

And I'll give you just a glimpse of what that data set actually looks like.

We'll pick a decade that we'll be working with.

It's a rather large file.

And these are the complete run of programs from the New York

Philharmonic, translated into a form called XML.

It's a lot like HTML, the language of the web.

It's a structured language.

So I'm going to use this data set to explore Leonard Bernstein's repertoire at the New York Philharmonic.

It was the centenary of his birth a few days ago.

He had a long affiliation with the orchestra,

including over a decade as the music director.

And I want to explore the group of composers

that he conducted, as a music director, and eventually

to compare it to that of his predecessors

and the music directors that followed him. Let's start, though, just with Bernstein's data set.

Our initial data set is all the subscription concerts

that he conducted during his music directorship.

As I said, the data comes from this XML file of their programs.

And I wrote a script in Python that parses this file

and produces two simple CSV files.

CSV is comma separated values.

They're essentially the simplest and stupidest form of a spreadsheet.

And we can view them in spreadsheet software such as LibreOffice.

The first is what I've called, Bernsteinnodes.csv.

And these are the nodes of our network-the entities in our network.

It's basically a list of people.

We have, first, here, Bernstein himself.

And then every other name in this list is a composer

that Bernstein conducted during his tenure

as the music director of the New York Philharmonic.

These, as I said, are our nodes.

They're the members of our graph, the points that we're going to connect.

You'll note too, each one has a unique ID number here in column A.

And I've also indicated whether it's a conductor or a composer.

Right now, we only have one conductor and a lot of composers,

but we're going to add more conductors later to do a comparative study. Next we're going to look at the edges. These are the connections between Bernstein and the composers. Each edge you might think of as a verb connecting two nouns, which are our nodes. So Bernstein, node 1, or the source node, conducted-that's the edge--Webern, node 2. I've also included a number here, called weight, in column C. The weight tells us the relative importance of each connection. So it's not enough to simply know that Bernstein conducted work by Edgard Varese or by Lukas Foss.

We want to know how often he actually did it

relative to all the other composers he conducted.

So that's what the weight is telling us.

It's the relative frequency with which these conductors

were part of Bernstein's concerts.

Finally, you'll note, I again have unique IDs that I'm using here.

Each person, in addition to being identified by name,

is identified by their ID number.

So, really, what I'm going to tell the program

Gephi is what the source number is and the target number is.

And those correspond directly to the ID numbers in our nodes spreadsheet.

That helps to avoid confusion, such as between Johann Sebastian and Carl Philipp Emanuel Bach. If you just have everyone by last name, it's going to look like a lot more Bach was conducted because it's going to combine those two composers. So that's what the unique ID numbers do for us.

## 



And here you can find a more technical introduction to algorithms used in GEPHI, I have fournished the transcription in the pdf file, I'm not able to comment this kind of material, it could be interesting for you if you want talk about this with prof. Verdicchio.

**VIDEO TRANSCRIPTION** 

INTERVIEWER: OK, it's time now to lay out our graph.

You can see down here, there's a layout box.

There are a wide variety of layout algorithms available to you.

Some of them simply move the dots around a little bit.

For example, expansion just spreads everything out a little bit,

but others actually lay out the nodes in a way determined

by a mathematical formula.

We're going to use the Yifan Hu algorithm,

which is

pretty good at clustering communities.

When I say it's laying out the nodes, what's it doing?

Fundamentally, it's treating our graph as

though it were a physical system.

The nodes are become like, say, electrons all

wanting to repel each other, and the edges

are like springs pulling things together.

The algorithm tries to create a stable physical system minimizing the energy in the system by reshuffling the

nodes in space until everything is

still or at least as still as possible.

Let's go ahead and run the algorithm, and you

can see this happening in real time.

That's fine, but it's a little crowded, so we can change what's called the optimal distance in this case.

We can spread things out just a little more and run it again.

OK, there's Bernstein at the center, and there are all the composers that he conducted. It looks kind of cool, I think, but doesn't really tell us very much. Bernstein conducted these composers, and yeah, he conducted this one more than that one. because this one's bigger, but we could see that with a simple table. What do we need network analysis for? Really, we want more information if we're going to learn something from this graph, so let's add some other conductors and their repertoire to the mix. Let's add more nodes, more edges, consisting of all the music directors that followed Bernstein at the New York Philharmonic,

plus his immediate predecessor Dimitri Mitopoulos, and all of the composers that they conducted.

We're going to expand, in other words, our data set.

Let's go back to our data laboratory, and you can see here, by the way,

that there's a new column in the data laboratory for the nodes.

There's what are called the weighted degree.

Remember, it calculated the weighted degree for all the edges,

and that's what it's using to size the nodes.

It also records that information in the data table.

But we're going to go ahead and delete those columns--

one-- because we're going to recalculate that information later.

Let's go back to--

that's import-- and add the other nodes.

Again, this is from a spreadsheet that's

just like the Bernstein nodes list

except it's got more names in it.

And we'll append it to our existing workspace.

And if we sort it by the category, you can see that we now have in addition to Bernstein

as a conductor, Dimitri Mitropoulos, Pierre Blaise, Zubin Mehta, Kurt Masur,

and Lorin Maazel--

excuse me, and Alan Gilbert.

How can we forget Alan Gilbert?

And we'll import our new edges.

You can see we've got a whole set of

other edges with other conductors.

Here's Boulez, and Bach, and Boulez, and

Frescobaldi, and Boulez, and Dvorák,

et cetera, et cetera.

We'll go back to our overview.

Now all these black lines here are the new ones we've just added.

They haven't yet had the coloring applied to them.

So let's apply the color, partition by category,

and let's rerun our weighted degree, and apply the sizing.

It doesn't like us.

Let's try again.

And we will do the spline function again to

make sure

that we see a little more differentiation.

There we go.

Now we're getting a little bit more information. Let's run the layout. Ah-ha, now we're seeing something. We're getting a little bit of information. You can see, for instance, that there is this core group of composers that everyone conducts. And at the periphery-if we run it one more time, it'll sort things out just a little better for us, and we can also run a function called no overlap, which prevents nodes from overlapping. And we can reset the zoom a little bit. peripheral These groups are the idiosyncratic repertoire of each individual music director. Here are our music directors in green, and

each of these sets out here are the people that only they, or mostly only they, conducted.

By hovering over the nodes, we can explore the network a little bit.

We can also turn on labels.

It would probably look a little better in black.

And if we go ahead and hover over a given node,

you can see all the nodes to which it's directly connected.

So again, this group in the middle here, everybody conducts them.

If we have over each music director, you can see how they're all lit up.

But then, each music director has their individual stable.

So here is Mitropoulos.

He conducts this core repertoire here, but he also

conducts these composers fanned out behind him here,

and the rest disappear.

One important point.

Unless the network structure is really specific

and reproduces every time you run a layout algorithm,

it's not the truth about, say, Mitropoulos is most like Kurt Masur.

Instead, it's just a way of starting to see the structure and form of the network.

We can't look at this and say Leonard Bernstein is most like Lorin Maazel.

but we can suggest some areas for us to explore in our analysis.

If we go and go ahead and look at

Bernstein's idiosyncratic group,

and here are some American names, you can see them--

Henry Cowell, in the upper left, or Ligeti, he was one of the few conductors to conduct Ligeti,

or John Cage, Dave Brubeck, he conducted in a concert, Morton Feldman. That's some of the idiosyncratic group for Bernstein.

You can also see a set of composers that Bernstein and Boulez shared--

for example, Olivier Messiaen or--

Nielsen is an interesting conductor-shared

among Bernstein, Gilbert, and Mehta. He had a sort of weird career-- or Gabriel Fauré.

You can see, for instance, a group here

that Bernstein shared with Kurt Masur--

Ottorino Respighi, Ned Rorem, and Bedrich Smetana.

Both Bernstein and Masur were the only ones

to conduct Smetana and Respighi in subscription concerts.

So we're not in a definitive position to say that Bernstein's programming is more like any given music director and

less like others,

but we can start to explore some of these connections further.

Finally, with Gephi we can save all this into a separate file.

We go to the Preview window, the third view form, the third pane tab

that Gephi runs.

And we can save it through here, but

before we do that,

actually, I want to make sure we highlight

Bernstein's network itself.

I'm going to go ahead and use this brush function,

and I like a bright blue for all this.

Let's select this blue hue here, and I'm going to click on Bernstein,

and it's going to color his node and all the nodes to which he's

connected with this bright blue.

Here's what Bernstein's work with the Philharmonic

looks like within the network.

Let's go ahead to the Preview window and save this.

You can tinker a lot with how your output looks.

I like a sharp black background myself.

I think it looks snazzy.

That's what it looks like without any labels.

You can mess with the edges.

I want to make sure the edges are a function of weight

and are a little thicker, but also a little bit transparent.

I don't like them curved, and I don't like any arrows.

OK, that's a little sharper.

Maybe we'll increase the thickness there. Good.

You can start to see the edges.

And we can add labels back.

We don't want proportional size, but we will make it bold and big,

and also make sure it's colored white, so

we

can see it with this black background.

There we go.

That's not too bad.

If we save that as a PNG file to our desktop,

call it Bernstein at the Philharnomic.

And if we go ahead and look at the file, there is our lovely graph.

And you can change the precision of the output,

so it's a little less blurry when you zoom in.

You can also save it to PDF or to an SVG file, which

is great for zooming in and out.

There is our network.



Now, let's turn our attention to the overview on some question emerging from ours discussion to observe strengths and weaknesses, in this sense we have to consider the title doubts, a non monolithic situation in a discipline in motion.


What we have seen on the VVV platform in the past lessons is only the tip of the iceberg, i.e. it's the synthesis result of a kind of zero episode carried out on a limited number of artists in the collection to whom a peculiar data visualisation mode was applied. But underneath this small pinpoint is a huge, humble and nerve-racking amount of work in planning,

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classification and data entry.

Classifying an object, of whatever nature, from an artefact to a photograph or a book, by adapting the classification to the computation of the machine, i.e. the type of data base and the characteristics of the compilers, is a Titanic undertaking. It is necessary to create a myriad of fields, the content of which must be normalised in order to be properly retrieved and inserted in the future. The fields must have stable and unambiguous relationships with each other. In short, if done well, behind what you quickly look for in a database there is a huge amount of work and a mountain of more or less severed heads. It is a typical condition for this kind of tools and every time one wonders why someone

improperly says that digital mode speeds up time and prolongs memory: nothing could be more false.

Behind the network analysis of the platform there is a powerful and flexible database built over the years by the researchers on FILE MAKER PRO, which has been mapped in its fundamental parts and brought back online trying to select the salient formats. And behind this database are mountains of hours of work and discussion. Prof. Verdicchio has told you many times, the machine cannot have common sense and so life becomes terrible.



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- FILE MAKER PRO
- RESEARCHER DATABASE



FILE MAKER PRO

The software built in FileMaker for researchers is a relational database structured in a series of channels, organised mainly around the thematic nuclei (sic) ARTISTS, WORKS, DOCUMENTS, BIBLIOGRAPHICAL MATERIALS, IMAGES AND CONTENTS.

As I have just said, It was in turn the

result of previous work carried out for the construction of other digital archives of contemporary art (Tancredi Archive, Manzoni Archive, Nigro Archive).



In this case I would say that the two most appropriate tags are complexity and sweat.

Here you can se just few examples of File Maker

(slide 2, film). The artists' file is the head to which the individual files created within the other channels are linked, and includes an initial page in which the biographical profiles made available by the research are collected, in chronological order,

(slide 3, film) Works, documents and bibliographical materials correspond to the main types of

Within each channel, each object is identified by a unique code, which in turn allows an object to be linked to another object (a work to a document, for example).

(slide 4, video) Each card has its own characteristics: in the card of the work, for example, two spaces have been designed for the annotation of the image (for its description) and the annotation of the texts contained in the work, which constitute a significant set of data for the study of verbovisual works,

(slide 5, film) Equally interesting is the study of the sources, i.e. the identification of the constituent elements of the work, mostly from printed materials, which allow the understanding of the artist's working procedures in the realisation of collage and assemblage, providing useful indications for the dating of the works, for example.

(slide 6, film) Documents, bibliographical materials and contents of various kinds can be linked to each work: directly, if the relationship is strong, indirectly, if significant juxtapositions are to be suggested,

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(slide 5, film) Equally interesting is the study of the sources, i.e. the identification of the constituent elements of the work, mostly from printed materials, which allow the understanding of the artist's working procedures in the realisation of collage and assemblage, providing useful indications for the dating of the works, for example.

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Altrettanto interessante è lo studio delle fonti, cioè l'identificazione degli elementi costitutivi dell'opera, per lo più da materiali a stampa, che permettono di comprendere le procedure di lavoro dell'artista nella realizzazione di collage e assemblaggi, fornendo indicazioni utili per la datazione delle opere, ad esempio.

Translated with www.DeepL.com/Translator (free version)

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Presentazione Milano Zanchetti

Con la collaborazione informatica di Giusto Manica abbiamo dunque progettato con il software FileMaker un database strutturato in una serie di canali, organizzati principalmente intorno ai nuclei ARTISTI, OPERE, DOCUMENTI, MATERIALI BIBLIOGRAFICI, IMMAGINI E CONTENUTI,

(slide 2, filmato). Il

file artisti costituisce il capo al quale sono collegate le singole schede create all'interno degli altri canali e prevede una pagina iniziale in cui sono raccolti, ordinati cronologicamente, i profili biografici resi disponibili dalla ricerca,

(slide 3, filmato) Opere, documenti e materiali bibliografici corrispondono alle principali tipologie di classificazione dei materiali dell'Archivio di Nuova Scrittura: all'interno di ciascun canale ogni oggetto è identificato da un codice univoco, che a sua volta permette di collegare un oggetto ad un altro oggetto (un'opera ad un documento, ad esempio). (slide 4, filmato) Ogni scheda ha le sue caratteristiche: nella scheda dell'opera, ad esempio, sono stati disegnati due spazi dedicati all'annotazione dell'immagine (per la sua descrizione) e all'annotazione dei testi contenuti nell'opera, che costituiscono un insieme di dati significativo per lo studio delle opere verbovisuali,

(slide 5, filmato) Altrettanto interessante lo studio delle fonti, ovvero l'identificazione di elementi costitutivi dell'opera provenienti per lo più da materiali a stampa, che permettono la comprensione delle procedure operative dell'artista nella realizzazione di collage e assemblage, fornendo indicazioni utili ad esempio alla datazione delle opere. (slide 6, filmato) A ciascuna opera sono ricollegabili documenti, materiali bibliografici e contenuti di vario tipo: direttamente, se la relazione è stringente, indirettamente, se si vogliono suggerire accostamenti significativi,



The initial work of the platform was created by translate File Maker conceptual map into the new one platform. No data entry was possible in the platform until now, with 3, 4 years delay and other funding the data entry was built. In addition to hard work, this is also sweat and weakness of the digital structure. As you can see, even from a distance it is far less articulate and rich than the initial file maker and this will certainly be a problem for the future quality of research.



Regarding the first point, choosing digital, we have said that it is fundamental for an institution and its technicians to understand what to digitize of existing material.

But in this case the consideration is different: we need to understand whether the choice of digital is the most convenient in terms of time and cost. As we have just seen in these last lessons, the time of research and data entry, the human resources and the costs that these two things require are never insignificant, quite the opposite.

Moreover, choosing digital reproduction of artistic production materials means entering a legal and administrative world that has to do with the concept of copyright. Digital reproduction is a field in full development. As always, the figure of a lawyer specialising in this field is fundamental among the human resources to be considered in the planning of a digital reproduction project.

Concerning digital Memory here we are with a very weak point: digital memory,

nothing more fragile. Operating systems, devices, software and their rapid change due to market interests, often make a work that has just been completed obsolescent and inaccurate.

At the end, improving digital: The quality of a digital platform is its movement and flexibility: can it be improved over time? Can we enrich it with data and problems? If the next researcher is not obsessively educated, a simple error of upper or lower case, of the wrong thesaurus can compromise research. If the software is no longer upgradeable, we have lost all our work. Frror is not allowed and this can be a real trouble. Survival is about adapting over time to unforeseen events, exactly what we are unable to do with

these projects.



VVV has encountered and is encountering all these kinds of problems, linked to funding over time, switched on and off, to relations between institutions that are not always clear, to the possibility of coping with unforeseen events linked to servers and their maintenance (I mean continuity), to the use of financial resources that should be substantial in order to recognise the ardour and effort that this kind of study requires, but which often prove almost humiliating for the professional recognition of the digital scholar.

## **KORELYAIMORY**



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But all is not lost, fear not: if memory and maintenance is the weak point,

there is no doubt about the creative aspect of this challenge. The obligation to cooperate generates big fights, but also big dreams, not always achievable, but in any case big and purposeful.



Do you remember that The final results of the project were presented at Mart, in Rovereto, on 15 April 2016 at the inauguration of the exhibition *Materiale immateriale* Through the objects exhibited, the exhibition provided a material counterpart to the immateriality of research and of the items explorable through the online portal. In that occasion it was possible to imagine, not exactly realize, but at least imagine and propose a new mix situation between the physical reality of the objects an the augmented reality of investigation derived from the online platform.





Tradition is preservation of fire, not worship of ashes Gustav Mahler exergue

Originally, the exhibition was not intended as a canonical display of the materials in the collection, but rather to illustrate the research model that had been applied to the classification and reproduction of the materials in the collection. It was therefore necessary to select a few objects chosen for their physical fragrance and to innervate them in the system of virtual reflections operated on them.

It was the presentation of an animated archive, built with real and virtual objects, interconnected by a complex relationship, articulated by a graphic structure able to recall the degree of density of the research, telling it visually and spatially in three dimensions. The materials in the collection suggested highlighting the complex relationships that interconnect them and their often fragile or "minor" nature: this was the challenge to reflect on the concept of immateriality as one of the new museum missions for the

preservation of memory and identity.

The Visual metaphors had then become conceptual.

it was about the dream of looking at history in a new way, of visualising it as a constellation of real and virtual objects, held together by graphics that could act as story telling.



A dream too difficult and expensive to realize, which in any case has resulted in no less than two exhibitions, a book and various research ideas that are still being developed.

The thing that has come closest to the original idea, which was to show not only the poetry of fragile products but also the density of research, is a very short video, created by a great illustrator, Guido Scarabottolo. The distant and close to concepts of the platform were theoretical concepts, methodological too. And this video syntetize the research work in progress of the research throught the graphic design animation of the artworks an document exposed.

Here you can see some of the original artworks reproductions on which the graphic designers has worked



YOU START WITH A CONFUSED SEARCH, FULL OF MATERIAL, YOU DECANT, YOU OBSERVE, AND YOU RETURN TO THE ACCUMULATION OF DATA THAT OBSCURES THE CONTENT
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## **BIBLIOGRAPHY**

- Burdick A., Drucker J., Lunefeld P. Presner T., Shnapp J., Digital\_Humanities, MIT Press, Cambridge (MA), 2012
- Moretti, G., Tonelli, S., Sprugnoli, R., Collecting Judgments on Artworks Through a Similarity Game. In Digital Humanities 2016: Conference Abstracts. Jagiellonian University & Pedagogical University, Kraków, 2016, pp. 846-847.
- Moretti F., Distant reading, Vasta, 2013
- ▶ Boschiero N., Russo V., Scatturin C., Materiale immateriale. Progetto VVV VerboVisualeVirtuale, Mart, Rovereto, 2016
- Harvard edex course: Introduction to Digital Methods for the Humanities, free Online Courses by Harvard, M.I.T. https://www.edx.org

## **WEBGRAPHY**

- http://www.verbovisualevirtuale.org.
- https://dh.fbk.eu.
- https://www.fbk.eu/en/about-fbk/
- https://dh.fbk.eu/2013/07/vvv-verbo-visuale-virtuale-la-piattaforma-diricerca-interattiva-dellarte-verbo-visuale/
- https://dhsite.fbk.eu/wp-content/uploads/2020/09/poster-ndrtn\_0.pdf
- https://www.youtube.com/watch?v=PgiZl6noPns&t=329s
- https://vimeo.com/olivierofiori