Non-linear Storytelling: Journalism through "Info-spatial" Compositions

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ABSTRACT Information Design is playing an increasingly critical role in everyday journalism. The movement from word and picture to "words within diagrams" is building a new form of truth telling and storytelling—and with it, a new journalistic aesthetic. This article, "Non-linear Storytelling: Journalism through Spatial Compositions" presents a series of controlled case studies for the "column" entitled "Visual Data" that appears on a weekly basis within the Italian newspaper Corriere della Sera. "Visual Data" is published every week within *La Lettura,* the Sunday cultural supplement within *Corriere della Sera.*

A fundamental shift in how text is "supported" distinguishes the Visual Data column from others within the publication. The traditional aesthetic of pictures coupled with text is instead interpreted through revealing, diagrammatically, the underlying "data" itself. In the traditional instance pictures or images (which may be said to be spatial in nature) are captioned or elucidated through text. In the examples presented under Visual Data the arrangement is "info-spatial." Text still plays a critical role, but it is nearly always in identification, captioning, or labeling roles; it is the last mile of the cognitive equation.

The end results: the info-spatial diagram supported by the traditional approach of photojournalist and reporter versus the info-spatial non-linear storytelling requires a different approach to content building. Aspects of aesthetics—whether these be visually compelling through "emotive beauty" or "functional beauty" are requirements for either approach. However, the "beauties" of powerful photography and writing within traditional great journalism are matched are to be compared to a new kind of "structural beauty" and "intellectual beauty" for data visualization. Again, the approach to creating effective outcomes requires a different kind constructor. If we are to catch, and retain readers' attention the goal must be to create
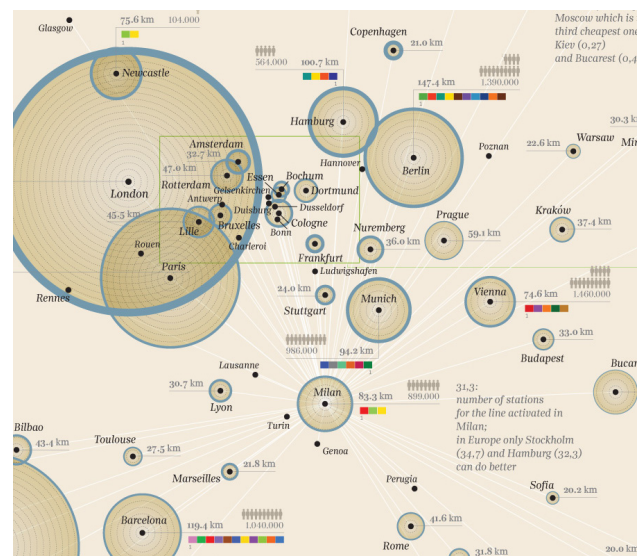

FIGURE 1: *Subterranean veins of Europe, originally published on La Lettura #35 (22th July, 2012)*

"layers" (the visual and textual composition) as opposed to "lines" (the linear composition).

Our design method, based upon layering multiple sub-narratives over a main construct prescribes this specific phenomena: the intelligent constructs that lead to info-spatial journalism. How might a team (oftentimes information design is a team endeavor) approach this process? This is of particular concern if a information diagram might be required on a regular publishing schedule. If such new forms of journalism become not merely supplementive of the older models (as is the case with information graphics supporting articles in lieu of images and illustrations) but instead *the articles themselves* (where the text plays the subservient role) what kind of protocols can ensure reliable generation of examples? The paper outlines the process through a general description of the layering idea and the spatial build-up of the visualizations. It goes into some depth describing a selection of examples and touches upon our data analysis and concept building toward the practice of journalism for info-spatial composition: non-linear storytelling.

INTRODUCTION

La Lettura is the Sunday cultural supplement of *Corriere della Sera,* the highest circulation newspaper of Italy. The author, within a team of four individuals, is currently tasked with creating visual presentations for a column entitled "Visual Data" within that supplement. We aim to reveal and advance how data-visualization can be used to provide new perspectives in the newspaper-editorial field.
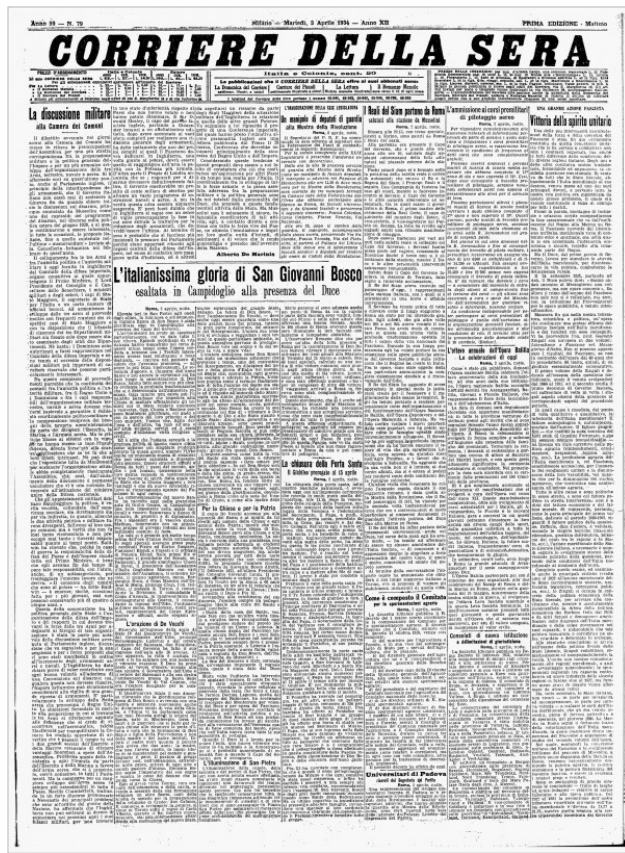
The Visual Data column, currently shown as a full spread within the publication, started from a collaboration between the cultural editorial office of *La Lettura* and *Density Design Lab,* a research lab in the design department of the *Politecnico di Milano* that focuses on the visual representation of complex social, organizational, and urban phenomena. So, for the first six months of existence of *La Lettura,* Density Design created and curated the format of the column as well as the actual production of its contents. Density Design experimented with multiple visualization techniques and software solutions during the analysis of varied complex cultural phenomena. After the boot-strapping the initial format and approach Density Design ceased involvement in the effort and this permitted new studios and designers (who worked in teams) to assume that role with *Corriere della Sera's* editorial office toward the creation of new visualizations. As of June 2012, the studio *Accurat,* has been working on a regular basis to generate the information design examples, realizing 11 visual articles so far. The author of this article (Giorgia Lupi) is an associate of Accurat, and is responsible for the design of the articles. Interestingly, I do not possess a formal background in information visualization, though I am currently engaged in PhD research at the Politecnico di Milano while working with Paolo Ciuccarelli from Density Design and possess a degree in architecture which is obviously a design pursuit. The three remaining associates at Accurat have majors in Design, Sociology, and Economics. This may appear to be a quite strange skill and competency set for a design studio, but indeed it's what may be is bringing the novelty and knowledge depth to our body of work. For the information design examples that we built for the Visual Data column we were given considerable leeway; still, the publisher established limita-tions on background color (and other color considerations), Fonts (we were limited to two controlled font families), and, of course, format.

TOWARD A NON-LINEAR, MULTI-LAYERED STORYTELLING LOGIC

For each week the team considers and pursues a topic we believe may be of particular interest to explore. Topics may range from current affairs to historical or cultural issues; we then analyze different kind of datasets trying to identify and reveal a central story—hopefully a not-so-expected one. As the effort to generate quality information graphics is not an insignificant one we are dedicated to undertake a topic that is worth of being
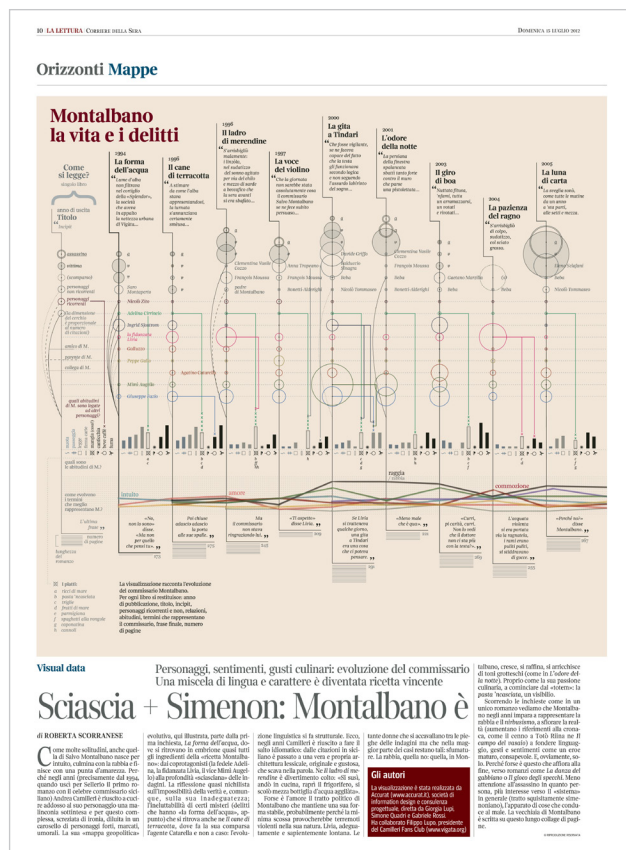
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FIGURE 2,3,4, & 5: *A very simplified transmission of the states of visual journalism is depicted in these four representative images. The oldest example shows text with heads. The heads help to navigate and identify what is purely a literate delivery of news. commentary, and idea. These are shown supplemented by photography or adjacent diagrams in the next examples. The last example, taken from the set within the series discussed in this paper, shows the current generation with a richly supported textual diagram. The future might dispense with supporting text altogether— interactive models support such visualizations well as they permit text to be ascertained only when it is deemed necessary or of interest.*

visualized toward a rich contextual lesson. The story must be worth being told through data visualization. The story and the composition is key, we aim to move away from mere quantity in order to pursue a quality transformation of raw statistical material into something that will provide new knowledge. In this respect info-spatial journalism is not data-visualization in the pure sense. We are not just providing insight into numbers but into social issues or other qualitative aspects as well.

This is journalism, and we need to provide the value of engaging readers. The leading story has to be catchy since we publish on a full-spread format within the cultural Sunday supplement of the highest circulation Italian newspaper. Having aesthetically "caught" our audience the presentation must be clear; the clarity does not need to come all at once, however. We aim to provide several layers of exploration. This yields our contextual non-linear storytelling where people can get lost in singular elements, minor tales, and "last-mile" textual elements within the greater visualization. Everything folds within the concept of layering, establishing hierarchies and making these hierarchies clear: this is the case for both the data analysis (the stories we desire to tell), and the visual composition (the main architecture and the aesthetic value we desire to present).

In summation, if we consider our collective presentation as composed of the pieces within a tale, we aim to build a singular "greater-story" built through the layering of sub stories, or story components. The big picture is the shape of the story and this must be seen at a first glance. From this high-level view through the understanding of main patterns and relationships further levels of non-linear explorations may then invite readers to "get lost" within the story(s) and engage at deeper levels.

"INFO-SPATIAL" JOURNALISM: THE LAYERING PROCESS
Following is the general sequence of design, the sequence is here argued parallel to the building of the layers. So the editorial process of selection, analysis, comparison, building hierarchies, etc., is in direct conjunction to the development of the layers. The editorial logic follows the design logic, layer by layer.

(1) *Composing the main architecture:* this is the basis that acts as the formalized base through which the main story will be mapped and displayed, upon this one will see the most relevant patterns emerging from the story: the essential "map" that shall conceptually identify where we are. This base is essentially a matrix or pattern that will serve as our organizer. It may be composed of cells, or distances, or other interrelated multiples.

(2) *Positioning singular elements* (essentially dots) within the main framework. This process is also one which will test the effectiveness of the main architecture; the placement of elements reveals or confirms weaknesses and strengths which may lead to modification of the main architecture.

(3) *Constructing shaped elements* of dimensionality, and

form (essentially polygons) with quantitative and qualitative parameters and *Positioning* these within the main architecture. As these elements have form they must also be identified through colors according to opportunities to establish categorizations, thus advancing clarity and relationships that serve to enhance the story.

(4) *Elucidating internal relationships* between elements. These links, directives, and qualifiers serve to give the story a comprehensive texture and correlate dependencies within the story.

(5) *Labeling* and *Identifying* through the addition of explanatory labels and short texts provides requisite "last mile" clarity throughout the presentation.

(6) Supplementing the greater story through the addition of "minor or tangental tales" elements. We consider this a very important step to contextualize the phenomena in a wider world. These components link the story to external ideas, other times, or other places. Elements that are rendered here may come from very diverse sources—analysis that is undertaken once we have strongly established the core story. These elements, which may take the form of small images, textual components, graphic symbols, etc., are to be located where they best help to enrich the overall comprehension. They must not distract from the main story.

(7) *Providing small visual explanations* such as a legend or key (adjacencies, see note) that assists readers and the general public who may not be familiar with norms of data visualization. These are composed to enlighten (reveal) the layered idea of the visualization, often constructed as miniatures of the layers themselves. The process usually involves simplification of the general architecture (e.g. the x and y axes, base timelines, or map components) as well as minimal explicit shapes, colors, and dimensions of singular elements. These explanations also provide units of measurement for distances and volumes, etc.

(8) *Fine-tuning and stylizing* of elements shapes, colors, and weights to make hierarchies pop out. Highlighting the relevant and visual constructing other several background layers of information should bring information selectively and sequentially revealed, helping readers discover stories by themselves and recognizing the patterns or interrelationships from one element within the story to another them all and the process beyond them.
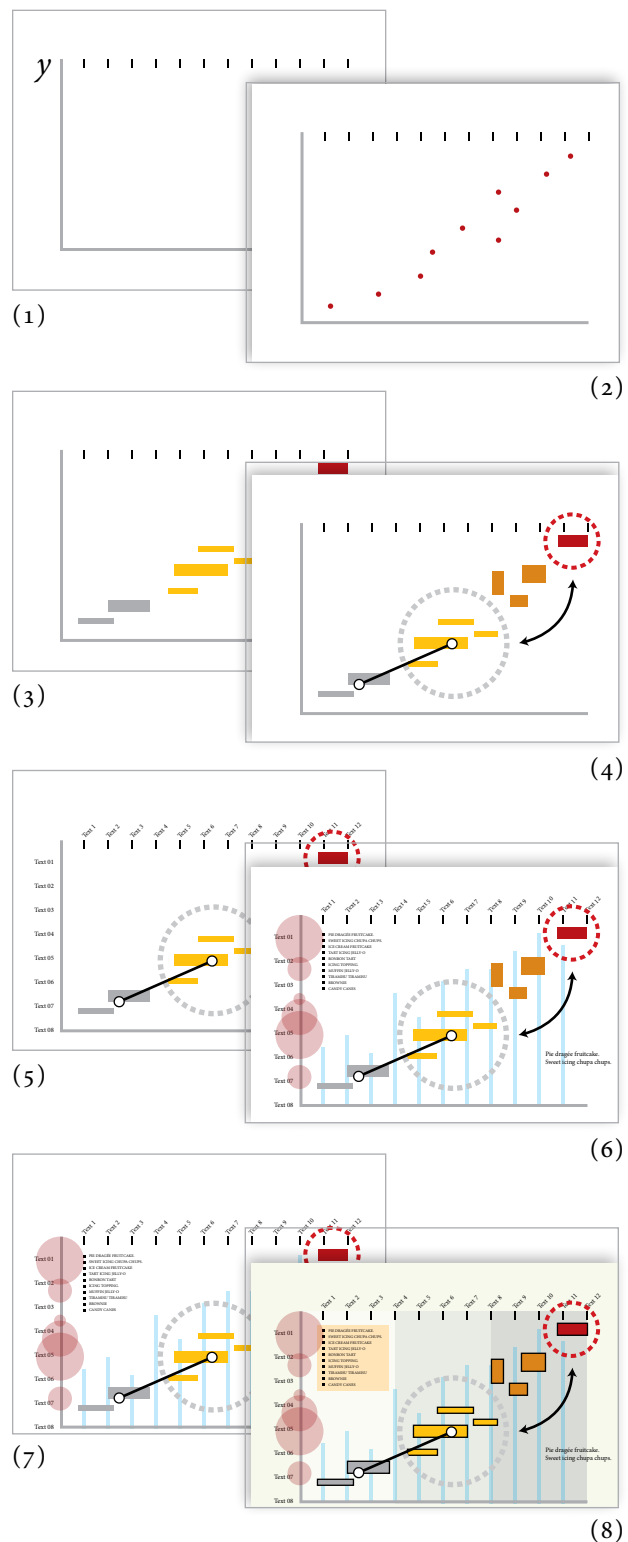

FIGURE 6: *The author's and team's process, from designing the initial architecture of the page through the final stylizing of the elements, falls within eight essential steps as discussed in the text and shown in simplified diagrams here.*
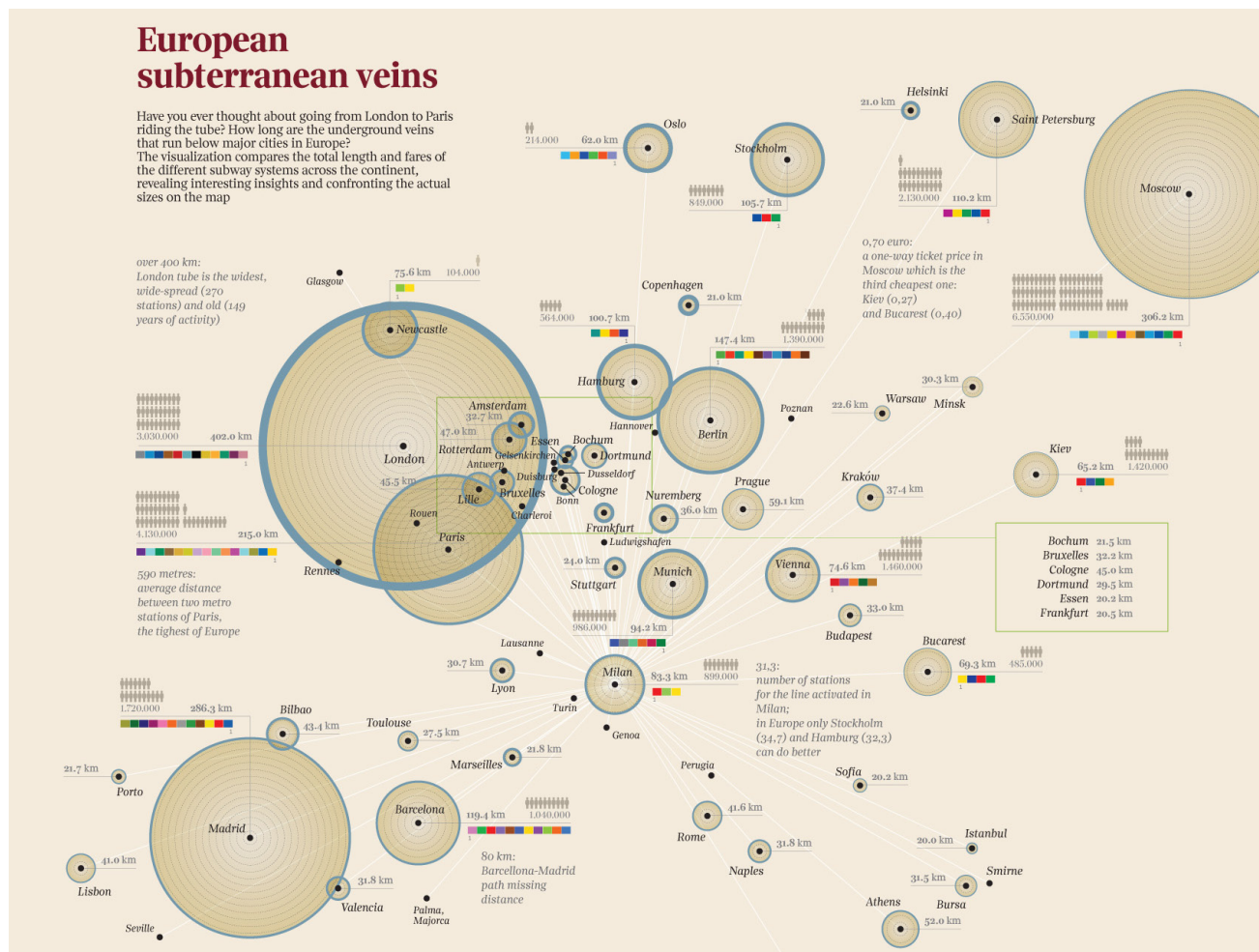
FIGURE 7: *English version of the visualization, originally published on La Lettura#34 (8th July, 2012)*

EXAMPLES OF THE INFORMATION GRAPHICS

In this part of the paper the process become evident through the post-published analysis of the visualizations themselves. An explanation of the layering process, or aspects of certain steps within the layering process is provided for selected examples. These general descriptions also address some of the editorial considerations that lead to their selection and development.

Subterranean veins of Europe was initiated with the concept of building a "what if" map of European subways. Have you ever though about going from London to Paris riding the tube? What if we take the total length of underground veins that run below european major cities and put them one after the other from the center of the city, building a novel map of imaginary travels? This is our first story. We found it compelling that European cities could potentially be reached by their subway lines. The visualization is based on a map locating each city in its actual position, where we simply cut the geographical morphology in order to enlighten this imaginary idea of traveling below the earth. Each city is represented by a circle the radius of which is the total length of its subway extension. The main tale is immediately recognizable: which cities are overlapping or so close to one another that they may almost be reached by subway?

The visualization then provides lots of other information by which each city subway system could be compared should readers desire to spend additional review: daily consumption (number of passengers represented with light pictograms), the colors of the lines (numerically ordered and represented by colored tiny squares), the cost of one-way ticket (indicated by the stroke thickness of each circle). It's then suggested that a possible evaluation of estimated distance from Milan (where Corriere della Sera is headquartered) with white (cutting the background) light lines pointing Milan as the center.

Painters' time is inspired from an article by Malcolm Gladwell published in the New Yorker, in which he tries to unveil the rules behind creativity and genius. Gladwell compares those artists that succeeded very early in their career, the young geniuses like Picasso, with those who had to wait until their mature years and had to practice far more to see their true art take form, such as for the old masters like Cezanne. Was it possible to draw a timeline that showed in what period of their lives the most famous painters of all times painted their masterpieces? The general architecture of the visualization became clear to us: painters should have been situated along a vertical timeline (enlightening centuries) according to their birth year, the painter "entity" represented as the line of the length of his life with productive periods defined within 3 main parts: young (up to 35 years old), adult (36 to 60 years old) and mature (61 years old and over). We normalized intervals according to the average life expectancy for each century. We then defined our own criteria as used to define which paintings are considered as a masterpieces. To do this we positioned on the life-line that first "official" point where the Italian edition of the Garzanti Art Encyclopedia refers as the masterpiece; secondarily we also placed a "people's" choice indicator; the first result related to the name of the painter on Google Images. In addition, we added further layers of information through color codes and shapes; such as main colors of the art piece, size of the frames, and the painting technique. Trying to look at the big picture of the story we wanted to suggest patterns' changing in time with a reference table enlightening main colors, techniques, sizes changing through

centuries as well as the average age of painters producing their masterpieces

FIGURE 8: *Zoom on painters handling: main piece by Garzanti Art Encycloped recognizable for each artist by using continuous stroke line; first piece resulting on Google images recognizable for each artist by using dashed line; period of life he composed the master piece is recognizable as filled with darker grey (and masterpiece according to Garzanti Art Encycloped is joining painter's life line in the precise moment.) Sizes and colors of paintings are comparable by the actual size and filling colors of squares.*
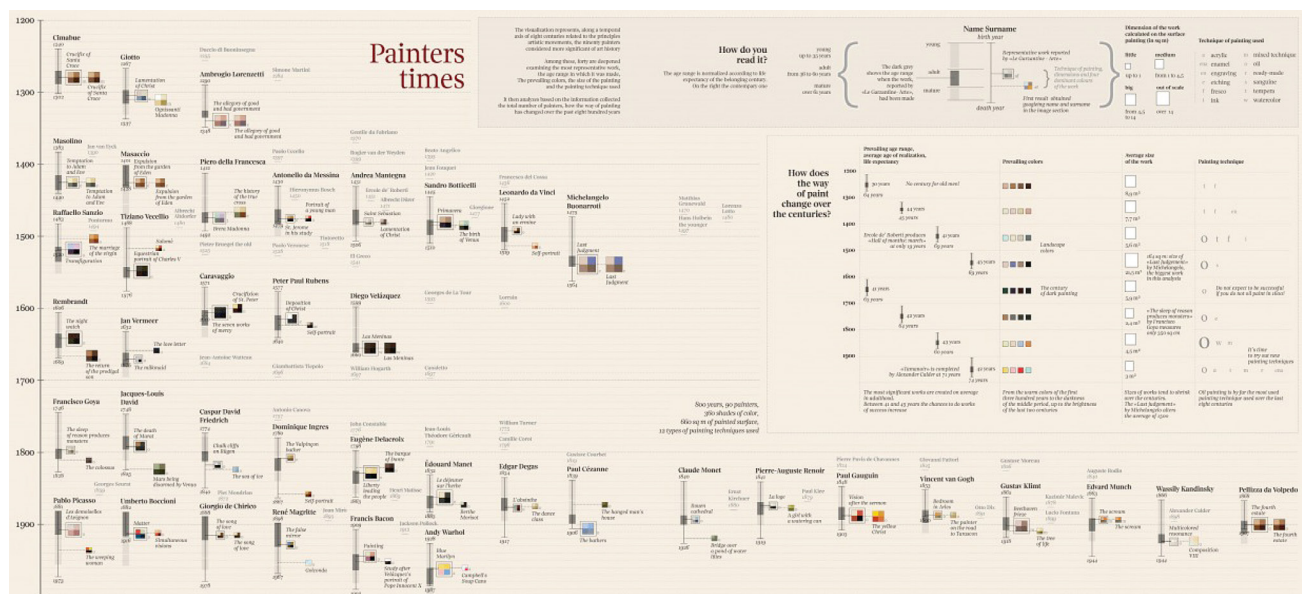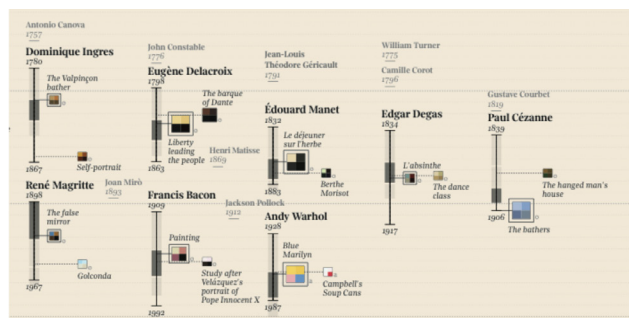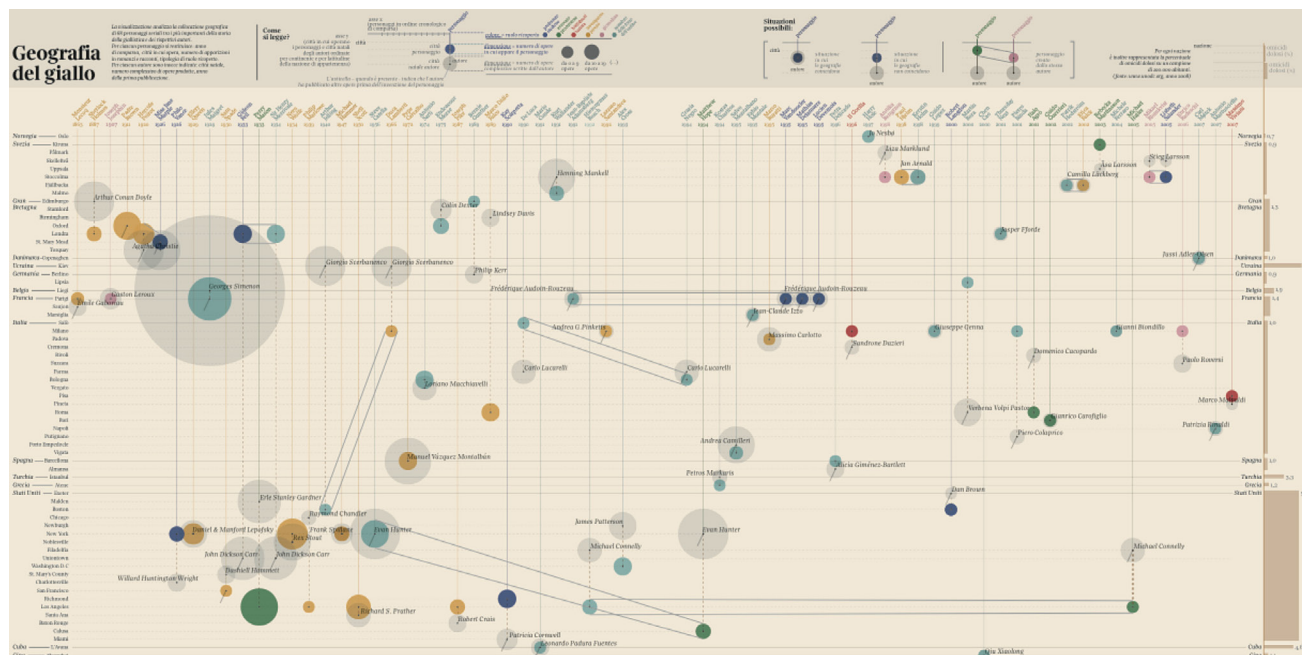
FIGURE 9: *Original version of the visualization, published on La Lettura#47 (7th October, 2012)*

A geography of detectives and authors in crime novels
Could geography be the key for understanding the context with a collection of crime novels? We tried to see if it could do this according to some initial insights we had while analyzing a selection of 68 detectives in crime novels we compiled together with Corriere della Sera experts The visualization analyzes the geography of these 68, enlightening relations between authors' home-town (and country) and where their detectives operate. Detectives are located horizontally according to their first appearance (chronological), and then represented with their main role (color), and number of novels they appear in compared to the total novels written by their author: these are rendered by the dimension of circles. The main story (geographic correspondence) is immediately noticeable by looking at where detectives circles (colored ones, according to roles) are inscribed in respective authors' circle (grey ones). Intriguingly, many actually match!

We then provided further levels the general story could be explored through: an inclined line which comes out only from those authors who published novels before giving birth to their most famous detective; connections are notated among those detective belonging to the same author (underlining eventual geographical patterns changing through time); a further sub-layer of explanation is given by an actual statistical data we provide for each country (extreme right side of the visualization): a simple bar chart showing the number of attempted murders every

100.000 citizens, helping to contextualize fiction stories in real life. Within the legend we then tried not only to explain main visualization features (positioning, dimensions and colors), but also to cover all the possible situations (geographical coincidence/geographical, not coincidence/ and, same author creating more than one character).
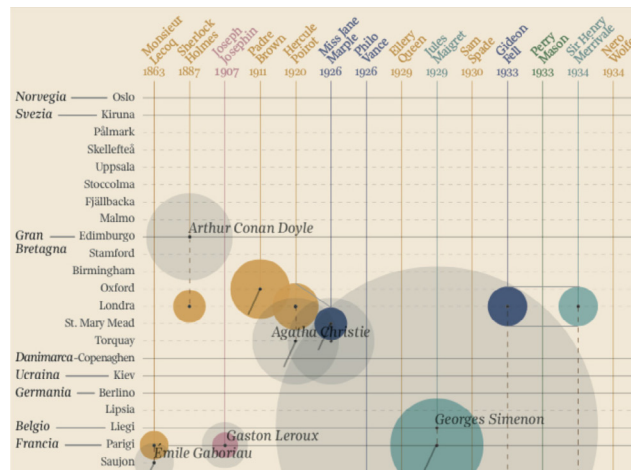

FIGURE 9 (ZOOM): *We tried to balance circle colors and opacities, main connection lines and text in order to make hierarchies immediately clear.*
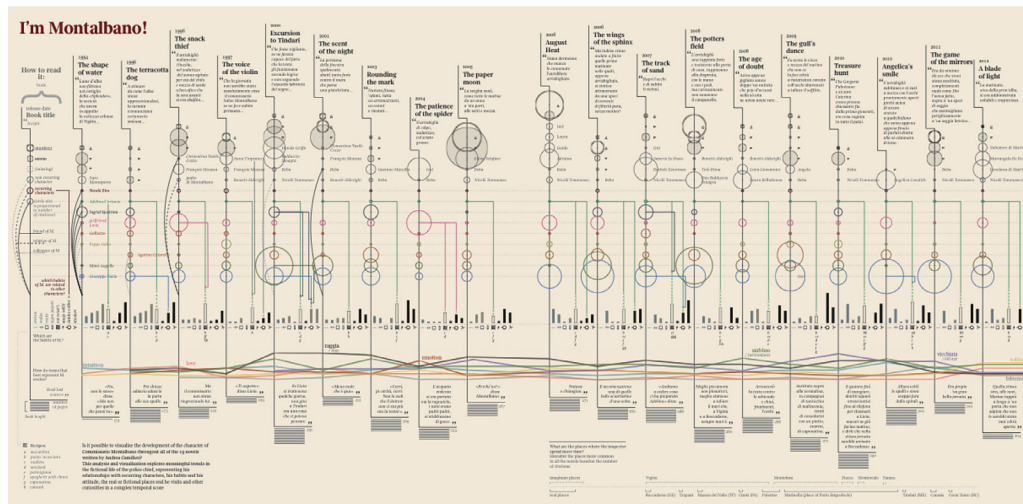
FIGURE 10:

*English version of the
visualization, originally
published on La Lettura
#35 (15th July, 2012)*

In **I'm Montalbano** we visualized the development of the character of Commissario Montalbano throughout all of the 19 novels written by Andrea Camilleri, exploring meaningful trends in the fictional life of the police chief. The visualization reveals his relationships with recurring characters, his attitude, the real or fictional places he visits, and other curiosities in a complex temporal score. The composition reveals his habits and changing characteristics through time.
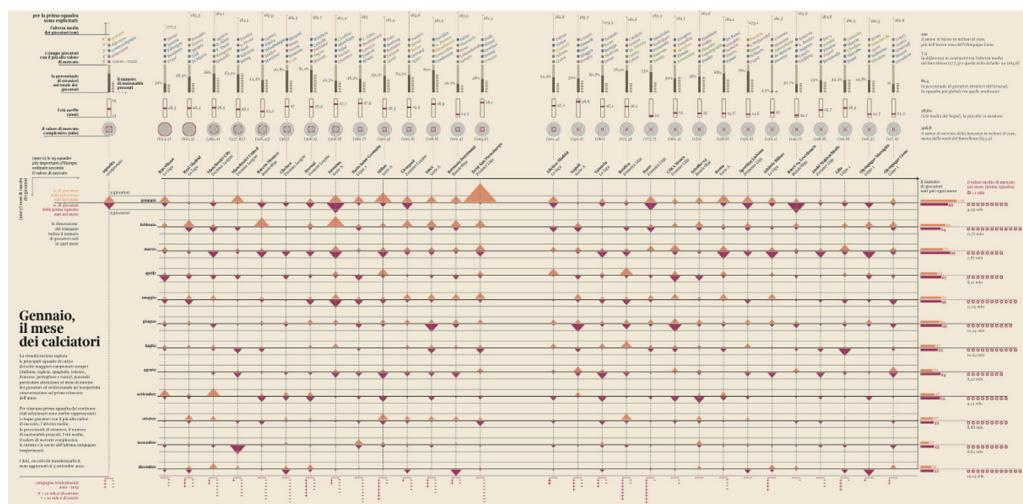
FIGURE 11:

*Original version of the
visualization, published
on La Lettura#44 (16th
September, 2012)*

January if you want to be a football player explores the idea of a "relative age phenomenon", and if such is verifiable even for soccer major teams. We reference the author Malcolm Gladwell, respective to his book *Outliers,* where he describes how he found a very high concentration of hockey-players born in the first months of the year, particularly in the youngest leagues. This is supposed to be because of the sport selection rules of the western system: children are divided into classes based by the year of birth: "bigger" ones are most likely selected for higher leagues and so have more chances to practice at higher levels while they're growing, this ends up in a huge disproportion in the distribution of months of birth even in the NHL.
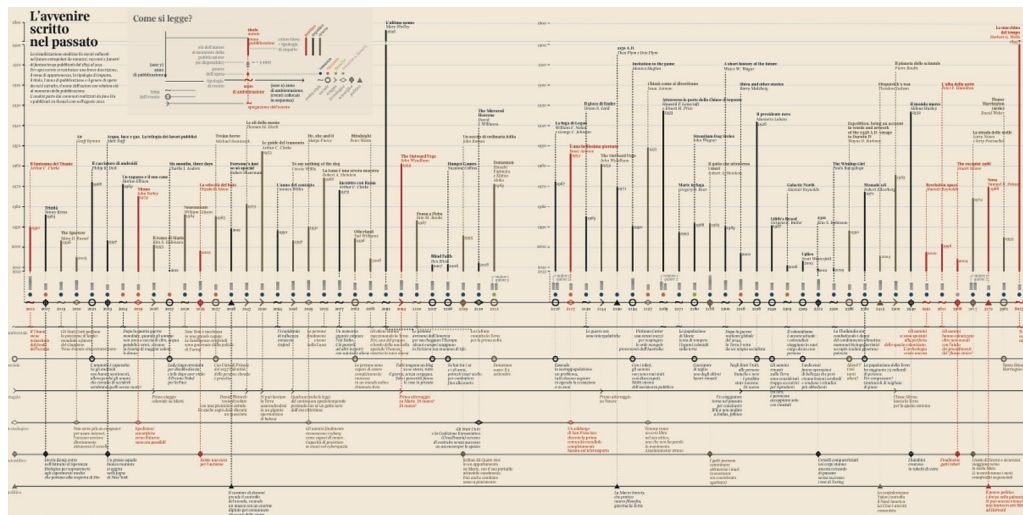
Visualizing the future bases on a selection of speculative fiction captions collected here: (http://www.theawl.com/2012/08/a-timeline-of-future-events) by Jane Hu. The visualization analyses 62 foretold future events. Each event is described within main typologies (are they mainly social, scientific, technologic, politic?), exploring the year it was predicted, the genre of the book, the age of the author, and more than all, dividing them into positive, neutral or negative events. Finally, good news, in 802.701 the world will keep on existing.
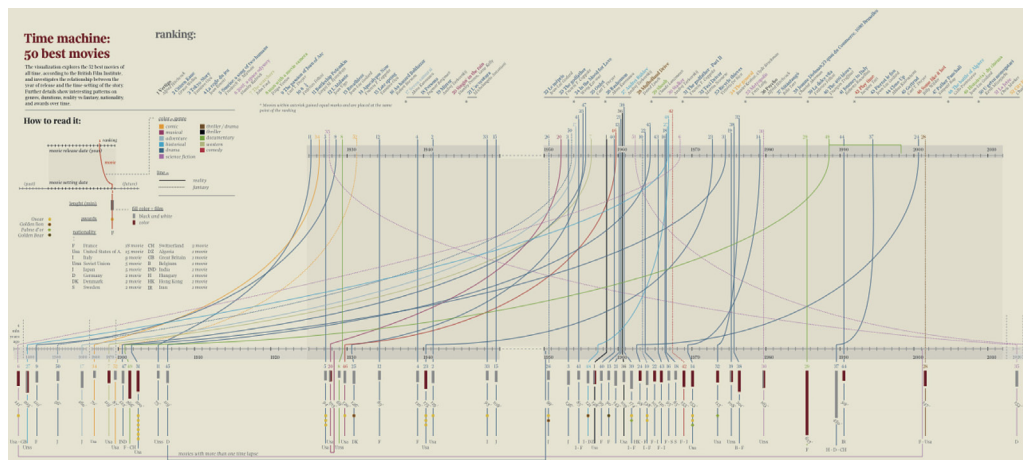
Time machine for art movies explores the 52 best movies of all time, according to the British Film Institute (http://www.bfi.org.uk/news/50-greatest-films-all-time), and investigates the relationship between the year of release and the time-setting of the story. Further details (provided close to the time-setting of the story) show interesting patterns on genres, durations, reality vs. fantasy, nationality, and awards over time.
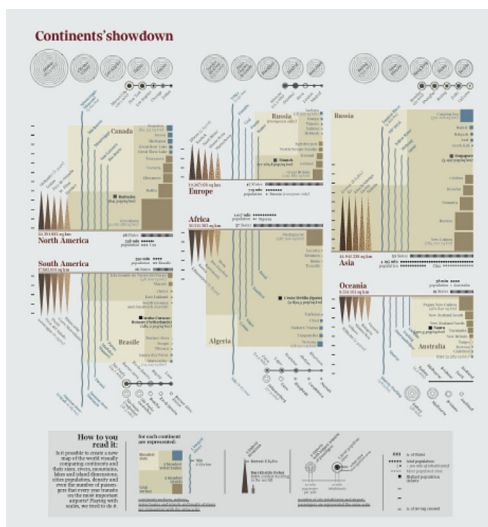
Continents' Showdown creates a new map of the world visually comparing continents and their sizes; rivers, mountains, lakes and island dimensions; cities population, density and even the number of passengers that every year transits on the most important airports. Playing with scales, to make everything actually comparable.

FIGURE 14: *English version of the visualization, originally published on La Lettura#39 (12th August, 2012)*
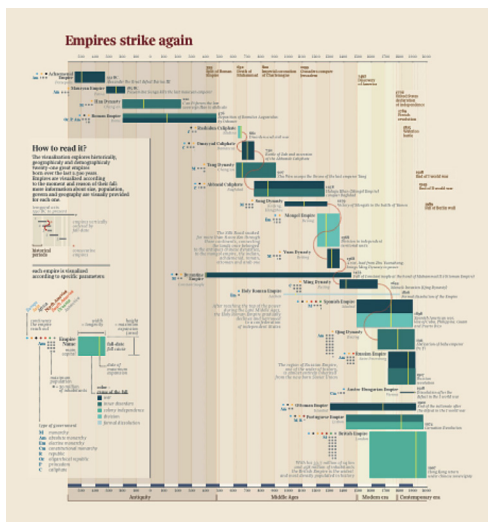
Empires Strike Again explores the reason why the biggest empires collapsed. The visualization proposes a new historical, geographical and demographical render of 21 big emperors since 2,500 years ago. Empires are visualized according to the moment and reason of their fall: more information about size, population, govern and geography are visually provided for each one.

FIGURE 15: *English version of the visualization, originally published on La Lettura#38 (5th August, 2012)*
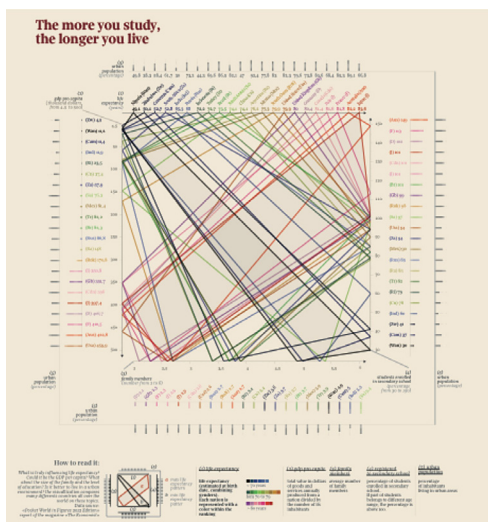
The More You Study, The Longer You Live
What is truly influencing life expectancy? Could it be the GDP per capita? What about the size of the family and the level of education? Is it better to live in a urban environment? We compared many differences of countries all over the world on these topics discovering, through a powerful visual rendering, that it may turn out that the more you study, the longer you live. It might also be possible, of course, that the longer one lives, the more they study!

FIGURE 16: *English version of the visualization, originally published on La Lettura#37 (29th July, 2012)*

CONCLUSION

To conclude, we would argue that the positive opinions we're receiving back from general public as well as from the editors could sustain our idea to achieve the goal of a formal journalism based information design and info-spatial aesthetic. An interesting point is that we did receive significant appreciation of educators and educational book publishers. This does argue that some of our pieces could be worthy of use as synoptic charts for explaining complex systems of information. We make no claim to have settled any universal information design and information mapping creating method, this is just ours, derived from our different backgrounds and attitudes. Further we were influenced (directed) by editorial constraints that are either narrowing topics we may want to explore, or constraining graphic freedom. However, these also may serve to advance and streamline the process. Perhaps, due to my (Giorgia Lupi) architectural background I sense the blank space of a spread-page needs to be filled with materiality somehow, even space, and it's because of this idea of materiality that blank space is a part of the composition that has to be made tangible as well. I would like to conclude by quoting Alberto Cairo, whose last book "the functional art: an introduction to information graphics and visualization" compares the relationship between visualization and art with the one between journalism and literature *"A journalist can borrow tools and techniques from literature, and be inspired by great fiction writing, but she will never allow her stories to become literature. That notion applies to visualization, which is, above all, a functional art. The role of an information architect is to anticipate this process and generate order before people's brains try to do it on their own."* In this manner the story matters and Aesthetics matter because they make the story when journalism is constructed into dimensionality.

BIOGRAPHY

Giorgia Lupi is an architect, designer, and researcher. After graduating in Architecture at Ferrara University in 2006 she has been involved in multidisciplinary projects exploring urban phenomena, information and technology. Ms. Lupi is a PhD candidate at Milan Politecnico, Design Department, within DensityDesign Lab; her PhD research aims at designing new methods for interpreting urban phenomena through digital traces. (giorgialupi.net) Currently, Giorgia is a visiting scholar at Parsons Institute for Information Mapping in New York. In may 2011 she founded the design company Accurat. This allowed he to build working partnerships upon past professional with Simone Quadri and Gabriele Rossi.

NOTES

1 Anderson, William, and Bevington, William, "Complications and Adjacencies: An Organizing Logic for Information Graphics" The Parsons Journal for Information Mapping, Volume II, Issue 3, New York

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Corriere della Sera webpage:
http://www.corriere.it/

La Lettura webpage:
http://lettura.corriere.it/
(working team: Serena Danna e Pierenrico Ratto)

Accurat webpage:
http://www.accurat.it/
(working team: Giorgia Lupi, Simone Quadri, Gabriele Rossi, Davide Ciuffi, Federica Fragapane, Francesco Majno, Stefania Guerra, Matteo Riva, Anna Bassi, Mario Porpora)

Full gallery:
http://www.visualizing.org/galleries/la-lettura-visual-data

Density Design webpage:
http://www.densitydesign.org/
Thanks to Paolo Ciuccarelli (Associate professor at Milan Politecnico and Scientific Director of Density Design Lab) for introducing me to the data-visualization world

FORMER ARTICLES ON OUR VISUALIZATIONS:
Accurat and Drew Skaw on Visual.ly
"mixed skillsets produce great infographics"
http://blog.visual.ly/mixed-skillsets-produce-great-infographics/

Andy Kirk on visualisingdata.org
"visual data section in Corriere della Sera"
http://www.visualisingdata.com/index.php/2012/08/weekly-visual-data-section-in-corriere-della-sera/