

The Synsemic approach to the design of information visualization

Instructor: Dr. Leonardo Romei

Language: English

Prerequisite: There are no technical or theoretical prerequisites for this course.

Course Description

The main goal of this course is to guide students through a theoretical and methodological perspective that will enable them to conceptualize and sketch visual artifacts to communicate effectively information.

This perspective, recently introduced but based on consolidated theories and analysis, is defined as “synsemia” and it sees the

domain of words, graphics, and images as an integrated system of expression.

The course brings a theoretical paradigm to the ground and provides design principles and analytical tools that can be, and have been extensively, applied in multiple kinds of information visualization projects.

Learning outcomes

- Master the process of information visualization.
- Categorize information in order to visualize and represent them effectively.
- Elaborate analytical tools to investigate the domain of information visualizations.
- See information visualization in a wider context: as part of the cultural eco-system and in the perspective of the history of writing.
- See information visualization as heuristic and investigative tools.

Teaching and Assessment Strategy

Teaching

Lectures supported by case studies and examples.
Individual and group work on projects through all the semester.
Structured discussions announced to students and prepared by them.

Assessment

Formative Assessment in the classroom through flash cards.
Participation in the discussions will be graded as a key factor.
Summative assessment based on essays and projects.

Modules	Description	Case Studies and Examples.	Class Activities and Assignments	References
The relationship between content and expression in the visualization of information.	Content and expression choices should be considered as a whole, as they are strictly related and they influence each other. For instance, if we consider newspaper design, the different genres of articles and the number of sections of the newspaper determine the number and characteristics of the visual categories to utilize.	International Newspapers: paper and online edition. Projects of redesign of Newspapers.	Apply the kind of analysis conducted by the instructor to a Russian newspaper, identify the organization and hierarchy of contents and propose a way to redesign it from the visual point of view.	Eco, U. (1999). Romei, L. (2015).
Texts and visual artifacts in the culture as an eco-system.	Written texts and visual artifacts, once published, influence the culture as an eco-system and create links with other texts in the media environment. The culture, as a brain, remembers and forgets, and it does it through texts.	The difference between the contemporary Web and traditional knowledge mediators and filters.	Identify and describe the “travel” of a relevant scientific paper from the original source to newspapers and to the media environment.	Assmann, A. (2006). Bolzoni, L. (2017). Lotman, Y. (2001).
Visual Variables and notational systems.	The notion of the visual variables it’s one of the most powerful tools to transform information in visualizations.	Metro stations maps in the world. Infographics.	List points of interests and landmarks of the city of Moscow, organize them by category and sketch a visualization.	Bertin, J. (2011). Romei L. (2014).
Information Visualization in everyday use.	Every day we interact with visual artifacts without paying too much attention to them. From their analysis, we can learn strategies that can be applied to information visualization projects.	Electricity Bills. School registers. App Interfaces.	Redesign an interface or a visual artifact with low level of usability, using the minimum possible number of visual variables.	Romei, L. (2015).
Graphics as heuristic tools.	Graphics are not only a way to express a certain contents or notions but are tools to investigate and discover new contents.	Galileo and Euler graphs and writings. https://bit.ly/2thQL37 A. M. Cirese diagrams.	Write the main steps of a scientific experiment and then sketch a visualization of it, without the use of words.	Bertin, J. (2011). Romei, L. (2015).
The domain of images and the	“I will use the Greek gramma, a word that means picture, written letter, and piece of writing. The verb <i>graphein</i>	Cubism before cubism, the visualizations of crystallography.	Structured Discussion on the main concepts. Students will receive the	Elkins, J. (1999).

notion of “gramma”	preserves a memory of a time when the divisions we are so used to did not exist” (Elkins, 1999).		excerpt from the book one week before the lesson and each one will identify a point to discuss with the other classmates.	
A key moment in the history of writing and reading: from the manuscripts to incunabula.	The invention of the printing press by Gutenberg, for technical reasons, introduced a clear distinction between words and images. These distinction is still operating even when the technology has evolved.	Two old book (incunabula) in two different editions during the printing machine transition. https://bit.ly/2GhTowa	Write a short essay on the differences between the two visual artifacts described.	Smith, M. (1996).
Cognitive types, categorization, and illustration	The process of interpretation shows the relevance of a specific culture in describing the same phenomenon. Perception and cultural categorization are linked.	Animals as described in different ages and cultures.	Visualize and sketch a food recipe without words and test with someone its level of comprehension.	Eco, U. (1999).
Linear and nonlinear systems of expressions, the alphabet prejudice.	The alphabetical system of expressions, starting with Aristotle, have been considered as the best way to express thoughts. Some analysis show that there is always a nonlinear characteristic in writing and that the integration with other systems of expression can be more effective in a lot of contexts.	Book “How to sky by the French Method”. https://bit.ly/2WSInVn	Describe a complex phenomenon only with the use of words, and then introducing basic graphics tools (as arrows and lines).	Harris, R. (2001). Lussu, G. (2007). Perondi, L. and Romei, L. (2010).
The synsemic perspective. From visual syntax to synsemia.	“Synsemia means the deliberate and conscious disposition of elements of writing in the space in order to communicate in a reasonably unambiguous way and in a regular manner, through the space articulation and the other visual variables.” (Perondi, Romei 2010)	The “Carta Pisana”, a portolan chart from the middle age. https://bit.ly/2BvVV05 “Nicea Council” Manuscript. https://bit.ly/2E2FXMF Contemporary Infographics.	Structured Discussion on the main concepts. Students will receive text and case studies one week before the lesson and each one will be requested to find a visual artifact to describe in the discussion.	P Perondi, L. and Romei, L. (2010). Perri, A. (2014).

The power of Visual Metaphors.	Visual Metaphors from the middle age to the present time have been used as a powerful strategy to synthesize complex notions.	Giacchino da Fiore's <i>Liber Figurarum</i> . Contemporary conceptual illustrators.	Find metaphors used in everyday life in the Russian language and sketch them visually.	Bolzoni, L. (2017). Lakoff, G., Johnson, M. (1980). Romei, L. (2015).
Accessibility, readability, legibility, understanding.	Information visualization artifacts need to be carefully designed to increase the global level of their comprehension: font choices, sizes, but most of all clear, meaningful and consistent hierarchy and organization of contents.	Drugs Leaflets Type fonts for the dyslexic readers.	Students will be asked to test different parameter of a font through Test Me platform.	Luciano Perondi and L. Romei, Test me font.
From the medieval manuscripts to the digital media.	Digital media can be considered and used as tools to go beyond the separation between words, graphics, and images. Information and data visualization go in that direction, but their distinction with the "main" written article is questionable.	Interactive data visualization. Best practices (i.e. The Guardian and New York Times).	Structured Discussion on the main concepts. Students will receive the excerpt from the book one week before the lesson and each one will identify a point to discuss with the other classmates.	Bolzoni, L. (2017). Manovich, L. (2010).
Graphics and images in science.	"In the scientific realm, the production of texts often draws heavily upon images, be they schematics or photographs, diagrams or figures. They are an integral part of the discourse, can be considered innate aspects of all written text, and can also be a powerful part of the research process: graphics and schematics, for example, are often employed during the investigation and verification of scientific research." (Falcinelli et al. 2015)	"Graphical Abstracts" of scientific papers.	Students will be asked to: analyze the structure of graphical abstracts of a paper; find a read a scientific paper and sketch a visual abstract for it.	Falcinelli, R., Filippini, A., Liberti, G., Perondi, L. and Romei, L. (2015, pp.9-13).
Interpretation, meaning, and visualization.	The visualization of information is strictly related to the process of interpretation and with the interpretive key.	Interactive Topography of Dante's Inferno. https://bit.ly/2I1Hc2x	Students are request read chapter, choose an interpretative criterion and visualize the results.	Bonora, G., D'Ugo, R., Dalai, G., De Rosa, D., Imperato, A., Martini, B. and Perondi, L. (2017).

References

- Assmann, A. (2006). The Printing Press and the Internet: From A Culture of Memory to A Culture of Attention. In: N. Gentz and S. Kramer, ed., *Globalization, Cultural Identities, and Media Representations*. Albany: State of New York Press, pp.11-23.
- Bonora, G., D'Ugo, R., Dalai, G., De Rosa, D., Imperato, A., Martini, B. and Perondi, L. (2017). The Project "Interactive Topography of Dante's Inferno". Transfer of Knowledge and Design of Didactic Tools. In: *IMMAGINI? Image and Imagination between Representation, Communication, Education and Psychology*. [online] Available at: <https://doi.org/10.3390/proceedings1090875> [Accessed 9 Feb. 2019].
- Bertin, J. (2011). *Semiology of graphics: diagrams, networks, maps*. Redlands, Calif.: ESRI Press.
- Bolzoni, L. (2017). *Web of Images: Vernacular Preaching from its Origins to Saint Bernardino of Siena*, London: Routledge.
- Eco, U. (1975). *A theory of semiotics*. Bloomington: Indiana University.
- Eco, U. (1999). *Kant and the Platypus: Essays on Language and Cognition*. San Diego: Harcourt.
- Elkins, J. (1999). *The domain of images*. Ithaca: Cornell University Press.
- Harris, R. (2001). *Rethinking writing*. London: Continuum.
- Falcinelli, R., Filippini, A., Liberti, G., Perondi, L. and Romei, L. (2015). Text and Image in the Scientific Realm. *Progetto Grafico - International Graphic Design Magazine*, (25), pp.9-13.
- Lakoff, G., Johnson, M., 1980. *Metaphors we live by*. Chicago: University of Chicago Press.
- Lotman, Y. (2001). *Universe of the Mind*. London: I.B. Tauris & Co Ltd.
- Lussu, G. (2007). The Form of a Language. *Typographic Papers*, (7), pp.139-147. Available at: <https://articles.c-a-s-t.com/lussu-file-4-the-form-of-language-480fbbeab9ae> [Accessed 9 Feb. 2019].
- Manovich, L. (2010). *The language of new media*. Cambridge, Mass: MIT Press.
- Perondi, L. and Romei, L. (2010). Le forme di scrittura penalizzate dalla stampa risorgeranno nei tablet. *Nòva 24 - Il Sole 24 ore*. [online] Available at: <https://www.ilsole24ore.com/art/tecnologie/2010-11-16/letture-recuperare-164729.shtml> [Accessed 9 Feb. 2019]. Partial English translation on <https://synsemia.org/2011/04/12/a-definition-of-synsemia/>.
- Perri, A. (2014). Why writing is not (only) transcribing? Writing codes in contact: steps towards multigraphic literacy practices. *Testo e Senso*, (15), pp.75-98. Available at: <http://testoesenso.it/article/view/205>. [Accessed 9 Feb. 2019].
- Romei L. (2014). "Jacques Bertin's Semiology of Graphics". *Progetto Grafico - International Graphic Design Magazine*, (24), pp.140-145.
- Romei, L. (2015). "Graphic Decisions are Theoretical Decisions: Notes on the Development of a Non-linear Argument in an Essay by Alberto Mario Cirese". *Progetto Grafico - International Graphic Design Magazine*, (25), pp.90-97.
- Romei, L. (2015). *Progettare la comunicazione*. Roma: Stampa Alternativa & Graffiti. (Note: an English translation of the needed excerpts will be prepared by the author himself).
- Smith, M. (1996). The typography of complex texts: how an early printer eliminated the scribes' red. *Typographic Papers*, (2), pp.75-92.