Informatica per le Digital Humanities
Lecture 2
March 1 2024

Texts

Slide 2

In the past lessons, again with a split trend, we introduced the general problems relating to Digital Humanities, trying to give them a theoretical and methodological definition that would compare the foundations and the differences between the two components.
Now it is up to give a scientific palette to the term DIGITAL, which explores the mathematical, computational and physical foundations that underlie the functioning of the machine.

Slide 3

And this is strictly necessary for DH, remember?
We used a chromatic metaphor to define digital humanities: we must consider this intersection, the relationship in-between, even if not as clear as a defined color, as the true identity of this research field.

It is the structure that we have given to the lessons to fully understand the chromatic metaphor. These Digital Humanities lessons must be understood as a sort of reading with a parallel text, on the one side the technical and methodological bases that underlie the daily use of digital tools and on the other their application to a concrete example to understand better the problems characterizing this production and to look at the technical issues with a historical and sociological gaze.
Today is about the deepening of the mathematical bases, focusing on the fundamentals of the numbers and figures that underlie all these endeavours.

Slide 4

The bibliographic reference for these in-depth computer, mathematical and physical lecture derive in part from this bibliographic source.
In particular, the first four chapters of the book give you the theoretical and philosophical foundations that underlie the term digital and the scientific disciplines that regulate the production of data and their computation.

Slide 5

There will be no specific technicalities in this effort: humanists cannot think of acquiring sufficient computer science knowledge, they don't even have to.
It is also necessary to establish some basic principles, to demonstrate, despite appearances, that this is not magic and that, only by fully understanding the main mechanisms of each language, it is possible to have that state of bidirectional correspondence that is necessary for the co-design work that the DH discipline requires.

Now, focus on the slide: how do you read this image?

How do you read the numbers, the colors, the letters? In truth all these are symbolic codes (where the symbol, as an element of communication, indicates in the mind of the observer a concept other than how the symbol is physically represented, be it a sign, number, gesture, or another entity as in the case that we are going to analyze) that acquire meaning also on the basis of the context.

How do you read this image?
A) mathematical hypothesis: (2 - 5) = -3
B) archival textual hypothesis: this part of the lesson concerns the digital aspect of lessons 2 to 5

To understand a symbol well, as well as life, you need a context: here we are returning to the theme of language.

Slide 6

I take up the problem that we have already posed in the definition of DIGITAL HUMANITIES, and, in trying to identify from the inside what has made the world we are in DIGITAL, we have to deal with the concept of COMPUTATION

It is often implied that computer science began with the first digital electronic computer, which seems to lead to the definition of computer science as the "science of digital electronic computers". Is this a universal definition? The rigorous answer would be no because we can easily find examples of efforts that are fully fledged computer science results but do not have a direct connection with digital electronic computers: Charles Babbage's "analytical engine" was a project started in the first half of the 19th century, that is, an entirely mechanical calculator inspired by Jacquard's loom capable of the four basic arithmetic operations. This clearly shows how one can do computer science without electronic computers and, thus, the definition above seems to be too restrictive. It is more than legitimate then to ask what is the connection between digital electronic computers and Babbage's engine, that is, what enables us to consider indisputably these efforts as part of computer science: the factors creating such connection would be the best candidate for a general definition of the discipline. We are speaking of the concept of computation: the analytical engine performs arithmetic operations, that is, it executes operations on numbers that yield numbers; digital electronic computers are comprised of circuits built insuch a way that they respond to electric impulses with other impulses and such response follows the rules of arithmetic.There is indeed a fundamental, even definitory link between computer science and computation. Let us not forget that one of the pioneers of computer science, Alan Turing, when writing about a "computer" in one of his most important works meant a person who computes, just like "player" means a person who plays. In his article, Turing presents his vision on how to automatize by means of a machine what happens in the brain of a human while they are performing some computation. In the second half of the 20th century,when the pioneering efforts of Babbage and Turing were followed by a number of success stories in the creation of such machines, the term "computer" lost its original meaning and acquired the one we are used to today, and the discipline dealing with computation and how to automatize it was called "computer science"

From *Computer science and art: Contradiction, revolution, evolution*. Available from: https://www.researchgate.net/publication/286269407_Computer_science_and_art_Contradiction_revolution_evolution