Electronic Poetry: How to Approach It?
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> "Most literary theories take their object medium as given, in spite of the blatant historical differences between, for instance, oral and written literature. The written, or rather the printed, text has been the privileged form […]". E. Aarseth[1]

In this article I will first summarize and analyse the methodology used to study electronic poetry, recounting the most important theories concerning electronic writings, then I will put forward a typology that I use to categorize electronic poetry, and then I will describe a possible approach to analyse electronic literature. This article is an extract of my PhD thesis on electronic poetry where I offer a critical analysis of several electronic poems. Here, I discuss the conceptual foundations and implications of the approach I decided to use in order to study electronic poetry, I establish the terminology applied in the analytic chapters and I propose a phenomenology of e-poetry.

Poetry has always been interested in experimenting with new ways of writing. However, the (computer and internet) media make the experiments with language itself a basic question. The new textual technology arrived with the invention and development of digital computing in the middle of the 20th century, which brought to literature's doorstep potent media giving it flexibility and more power than any preceding ones. New poetic texts have emerged with digital computing and automation. These texts – due to the peculiarities of their medium – require a different approach and reading practice in order to be *understood*, and they open up interesting questions such as the idea of poetry in the new millennium, the role of the reader – and consequently of the author –, and the relationship between medium and message.

The term "medium" derived from the Latin word "medium" meaning "means/way". *Britannica's* dictionary defines the word medium (plural media) as:

1. a channel or system of communication, information, or entertainment – compare *mass medium*;

2. a publication or broadcast that carries advertising;

3. a mode of artistic expression or communication;

4. something (as a magnetic disk) on which information may be stored[2]

Webster's dictionary proposes two distinct definitions:

1. Medium as a channel or system of communication, information, or entertainment;

2. Medium as a material or technical means of expression (including artistic expression).

Narration in Various Media defines it partly thus:

The term of medium […] thus covers a wide range of phenomena such as: (a) TV, radio, and the internet […] as the media of mass communication; (b) music, painting, film, the theatre and literature as

the media of art; […] (d) writing and orality as the media of language; (e) handwriting, printing, the book, and the computer as the media of writing.

For Walter Ong[3] media are "pipelines" for the transfer of a material called information. However, as underlined by Marie-Laure Ryan, if media were simply undifferentiated "pipelines" for transmission of artifacts (a film broadcast on TV) they would not have narratological interest, and in our case poetic interest[4]. According to Ryan: "the shape of the pipe affects the kind of information that can be transmitted, alters the conditions of reception, and often leads to the creation of works tailor-made for the medium"[5]. She continues on by saying that from a narratological point of view channel-type media are only interesting to the extent that they involve "differences that make a narrative difference".

Marshall McLuhan describes the medium as "extension of man": "[media are] forms that shape and reshape our perceptions", and his very famous quote declares that "the medium is the message"[6].

Film, radio, TV, and internet have developed their own storytelling capabilities, their *poeticity*, their own "language": thus it will important to analyse what kind of "new language" is putting forward by poetry using "new" media such as computer and internet In e-poetry there are strategic elements – such as infographics, the *poeticity* of the elements, their [il]legibility, the pluri-signification of the relation image-text and the flow of the reading process in the textual rearrangement — which affect the poem's structure. They create new tropes and figures and, consequently, a new aesthetic sense. All these constitutive elements produce different kinds of creation and reading practices, which, from one side, seem to propose an active and sometimes playful sort of approach to the poetic text and from the other suggest corruption between genres, pushing poetry towards web-art and linking the literary word to Artificial Intelligence (AI).

In e-poetry the roles of both the reader and the author have been at least redefined in relation to "traditional" poetry as far as probably in every kind of e-poem one or more of the following processes occur: a) users have to interact with the poem (in some cases they have to act on the text for the text to appear), b) there are forms of collaborative and/or generative procedures that mutate the poetic result, c) poems can be ephemeral, d) the reading practice can remind the reader of a sort of writing experience (due to certain actions the reader has/needs to perform in order to read the text).

Poetry transforms the medium in the same way that the medium transforms poetry. The historical examples show us that every time that a technological change has occurred, there have been remarkable advances and developments such as with the illuminated manuscripts, as one significant example. How can we approach *the new poetic genre* that is emerging by the advent of the digital media?

1. The Challenge of Semiotics: Semiotics of New Media Literacy

The problem of how to theoretically approach the field of electronic poetry is a difficult one. E-poetry puts forward a new kind of textuality, which implies new reading strategies. Aarseth in his famous book *Cybertext*[7] states that there is a need of a new definition of textuality in addition to the previous definitions proposed by different disciplines or theories such as philology, logic, semiotics, structuralism and post-structuralism. He adds that none of the previous approaches "have expressed the perspective of the text as a material machine, a device capable of manipulating itself as well as the reader"[8]. He carries on by pointing out that not even semiotics "the most oriented of these epistemes, does not seem to offer any readily useful prospective in this context"[9]. He quotes Per Aege Brandt. Brandt notes that:

> neither the interpretative semiotics based on the Peircean tradition (such as Eco), nor the structural semiotics of the Seussurean tradition (Greimas) – thought both necessary – seem sufficient to follow up the substantial change induced by the on-going implementation of these machines in our 'life world', probably for the very simple reason

that even these often rather sophisticated semiotics elaborations fail to see what a 'symbolic machine' actually is and what it can do.[10]

Aarseth suggests that Brandt's critique

> trivializes the reason for recent semiotics theory's inability to account for cybernetic sign production, since this phenomena could not have been invisible to theoreticians such as E. Eco and A. J Greimas, who surely must have had some contact with the cybernetic ideas and experiments of contemporary individuals and groups such as R. Queneau (1961), Italo Calvino (1993) and Ouvroir de la Littérature Potentielle (OuLiPo 1981). If these phenomena, together with computer machinery and principles in general, were indeed invisible to the semioticians of that time, I suggest that the reason for this blind spot is to be found in the semiological paradigm (which seems inherently unable to accommodate the challenge from cybernetic sign systems) and not in the lack of historical opportunity.[11]

Both Brandt's (1993) and Aarseth's (1997) critique on the limits of semiotics' approach to text which implies *cybernetic* textuality, demonstrate the importance that semiotics has acquired in studying these kind of texts. But is the semiotic approach able to describe these texts? Does the methodology provided by the sciences of language remain effective when analysing these technological objects?

One could reply that electronic texts are just texts that use another support, but they are still texts even though they put forwards peculiar characteristics, which, however, are not completely new to the language theory, such as multimodality (syncretism) or the multilinearity (coexistence of alternative paths). We will see further along in this article how semiotics – in its broad[er/est] meaning – can be useful in the analysis of e-text. About fifteen years have passed since those critiques were made and semiotics itself has changed to take [and now takes] into account "the challenge from cybernetic sign systems".

1.1 The Semiotics of New Media Literacy

According to Giovanna Cosenza[12] the semiotics of new media can be considered as a branch of semiotics that aims at investigating the new media as texts. Cosenza studies the grammar of the new media, their systems of signs, offering the tools to perform textual analysis.

 But what is a text? This is an old and complex question. In a limited space such as this, it is impossible to even briefly trace the arguments of previous discussions of this question. Let us say that the study of the text – as a higher level unit than the study of the sign – began in the second half of 20th century thanks to the structuralism approach. Structuralism shifts the object of its study from the sign to the *code* – therefore the text[13]. Semiotic codes are procedural systems of related conventions for correlating signifier(s) and signified(s), they provide a framework within which signs make sense[14]. However, according to most semioticians a text can be defined as "is a system of signs (in the form of words, images, objects, sounds and/or gestures). It is constructed and interpreted with reference to the conventions associated with a genre and in a particular medium of communication. A text is the product of a process of representation and 'positions' both its makers and its readers"[15].

In his influential book, *A Theory of Semiotics,* Umberto Eco (1976) defines semiotics as "the discipline studying everything, which can be used in order to lie"[16]. Eco continues, "[s]emiotics is concerned with everything that can be taken as a sign. A sign is everything which can be taken as significantly substituting for something else"[17].

Semiotics investigates the text by using qualitative and descriptive methods, in particular moving from the surface (uniqueness of the text) to depth (abstraction). According to this description the text seems not to be a closed object, but it weaves between various relations both internal (see Greimas' semiotic square) and external (intertextual relations to the semiosphere - Lotman). According to

Spaziante and Dusi[18] this network of connections with what is outside of the text becomes particularly important in contemporary textuality.

The definition of literacy has been changing rapidly. Media Literacy was defined at the Aspen Institute in 1989 as "ability to access, analyse, communicate, and produce media in a variety of forms". Media literacy is more than asking people to simply decode information that they experience in the media, but they must be able to respond and produce media. Today, gaining Media Literacy skills is becoming more important to understand our society. Even though digital literacy is a sort of "discipline" for the information sciences, the digital literacy point of view can help us to approach the electronic-artistic text.

Glister defines Digital Literacy as:

> the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers [...] [N]ot only must you acquire the skill of finding things, you must also acquire the ability to use those things in your life. Acquiring digital literacy for Internet use involves mastering a set of core competencies. The most essential of these is the ability to make informed judgements about what you find on-line.[19]

The Semiotics of New Media Literacy can help us to approach texts deeply transformed by their medium, texts that can be transformed by themselves, texts that can be manipulated by the "reader", texts that can escape – materially – the author's control. This approach can help us to better describe, analyse, and interpret what Aarseth calls the *textonomy* (the study of the textual media) and the *textology* (the study of the textual meaning)[20].

1.2 Semiotics and the *Digital Corpus*

Semioticians (and linguists) normally describe *languages* or *texts*, or *discourses*. For this reason semiotics seems still to be a good approach in order to analyse texts that are not *static* any more – as normally the *textual corpus* is. Static texts do not change sensibly over time but *dynamic ones* do. Being dynamic is one of the most important characteristics of the *digital/hypertextual corpus* – these texts change and sometimes they can even disappear. What kind of tools do semioticians need to describe texts characterized by *multimodality* and *multilinearity*, by being dynamic and sometimes even ephemeral?

Normally it is thought that semioticians analyse and hermeneutists *interpret*, but the border is very fleeting and its value can sometimes escape us. According to Hjelmslev's approach the description is the procedure that aims at getting the *systematic* aspects – which are concretely realized in those phenomena that semioticians want to describe – starting from the process. For Hjelmslev the description must be scientific thus it is opposed to the hermeneutic description, which wants to understand a single text[21].

Umberto Eco[22] proposes an interpretative semiotics following on from the main concept of interpretation formulated by Charles S. Pierce. Very briefly, these two viewpoints derive from two ways of interpreting the sign. Ferdinand de Saussure and Pierce propose two different conceptions of the sign – or rather the relationship with the signification. This does not mean that the two visions are mutually exclusive and that they cannot be integrated, but generally they gave rise to different approaches to the text. According to de Saussure the sign is the relationship between a *signifier*, understood as the image of a sound which is then physically produced, and a *signified*, the concept of what one wants to refer.

Pierce's definition of semiosis concerns three elements: a *representamen*, the material part of the sign, an *object*, the referent to which the sign refers, and an *interpretant*, which is derived or generated by the sign. The starting point in Pierce's semiosis is in external reality; meanwhile for de Saussure the referent has an "accessory" role in order to define the relationship between signifier and signified.

The meaning of signs or representations is dependent on social, cultural, and historical contexts. We construct meaning based on the physical appearance of the sign, our previous personal and cultural experiences, the time or era we live in, and context or place in which it occurs. There is not one meaning or interpretation of each sign. There are multiple sides and points of view to each sign.
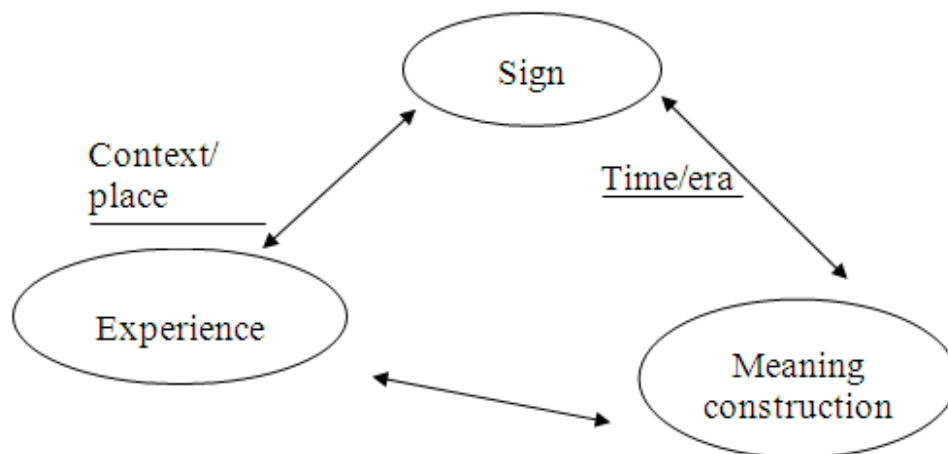

FIGURE 1: Construction of Meaning in Media Literacy – Melda N. Yldiz

The introduction of internet communication into human discourse has influenced semiotic forms throughout world cultures. With the penetration of new media and computer mediated communication systems, human interactions are changing at a rapid pace. Computers and the internet influence the way we communicate and the way we create.

These changes in the creation practice affect the text's form – the text is not static any more, it can often require the interaction of the reader – making texts resemble objects. Already Marshall McLuhan in 1967 talks about the importance of moving images for the so-called post-modern society:

> The aim is to develop awareness about print and the newer technologies of communications so that we can orchestrate them, […] And get the best out of each in the educational process. Without understanding of media languages and grammars, we cannot hope to achieve a contemporary awareness of the world in which we live.[23]

He goes further and he highlights the importance of understanding media "grammar" and "language". The media are texts and have their own language and grammar to analyse and understand in order to appreciate the artistic production they are making.

2. The Act of Describing and the Act of Interpreting

In the semiotics ambit each analysis starts by dividing the process. The analysis of the process concerns, according to Hjelmslev's terms, the research of the homogeneous dependencies between the elements they are composed of. Depending on what is the outcome of the description we will have either a general analysis (language's analysis of the text which presides over the manifestation of the text) or particular analysis (textual analysis, analysis of the realized signification). General and particular analyses point out the two aims of the description: we can ponder the similarity of objects and/or focus on the peculiarity of an individual signification form.

2.1 The Act of Describing

Hjelmslev considers the concept of "description" as an *indefinable* of the theory. In *Prolegomena* he states that this task can be completed only through an informal definition[24]. According to him, the linguistics' "making" should be congruent with the empirical principle, which means that the description must be done following three criteria: *coherence*, *exhaustivity*, and simplicity. These actions become a succession of ordered operations which compose a procedure.

The description is a procedure which focuses on the systematic aspects of a phenomenon. According to several semio-linguistic, approaches the description allows us to discover the specificity of a *semantic use*, the general regularity of a genre, of an idiolect, and the stylistic peculiarity of a text[25]. According to Zinna, semioticians can describe to have results which differ among them. Semioticians can describe in order to find out the *recursivity* of a language, of a narrative structure, of a genre, and of the style of a text[26].

2.2 The Analysis

According to Hjelmslev, before being described the object is a *subject* not yet analysed. From the procedural point of view, the first step to follow in doing the analysis is dividing the subject into two planes: the planes of expression and the planes of content.

Zinna introduces a distinction between the "level of manifestation" and the "level of immanence" to underline the difference between the descriptive and the analytic approaches. The level of manifestation is the level where the phenomena semioticians describe are placed. The level of immanence is the level where the regularities with which these phenomena become manifested. The description thus is a relation between a manifested phenomenon and a structure of immanence organization which the observed phenomenon is conduct back to[27].

The invention of electronic writing introduces manifestations that require new descriptive criteria. Zinna wonders what immanence we should attribute to these manifestations[28]. According to him any fixed structure we can recover from the semiotics of the text – such as the language, the discourse, the narrative structures the genres and the styles – will be pertinent for electronic writing too. These structures, however, could be different from those we find in the texts. Electronic writing is a new phenomenon which calls into question all the levels of immanence known and arranged in order to study texts.

3. The Electronic Text

Zinna argues that any object of writing finds its origin in the contact between a discourse and its material support[29]. Writing is the contact point between an internal and intense memory of the subject and an objective and a collective memory in the external and extense space of materials. He adds that:

> in quanto tale, la scrittura esiste solo come *pensiero* della sua trasposizione su un supporto. Questo pensiero implica non soltanto un codice, ma un gesto e una tecnica di iscrizione. […] Nonostante il problema del supporto si presenti anche nella lingua parlata, l'esistenza di una *materia* del supporto costituisce una proprietà specifica dell'oggetto di scrittura.[30]

In my approach to electronic poetry, I take into consideration the object in its whole, thus the support as well because the medium has always affected the creative product, but the electronic medium makes the text's dependence on the support deeper and easier. The support has intrinsic physical features such as for instance its resistancy, flexibility, consistency, weight. This physical substance makes writing an object, that is to say an element that has extension in space and duration in time.

One of the current peculiarities of electronic texts is actually their short life. We write to preserve; papyrus, codex, printed books maintain, are maintaining, will maintain our memory. E-texts in general and e-poems in particular do not live too long unless specifically archived. Sometimes the web site closes or the software, the format to read the e-text are changed and suddenly the e-text is "unreadable" – let's just think about all the texts saved in floppy format which are now obsolete[31].

3.1 The "E-text" Theory

In this section I will summarize just a few of the most significant theories concerning electronic media and electronic writing[32]. The heritage of French Theory in approaching especially hypertextual writing is evident and well known. Some scholars of French Theory in the United-States define the thinkers of "post-modern" literature and philosophy as prophets of the internet era. However, as some other scholars have shown – among them François Cusset[33] – the use of various French Theory concepts by assembling a few random quotes as scholars of French Theory in the United-Stated sometimes have done - decontextualizes the ideas of French Theory.

Nevertheless, it is undeniable that the construction of the internet was realized following the sociocultural environment that took place during the 60s. Some metaphors used in philosophy – like for instance the concept of the rhizome – were/are used also in the technological ambit. In 1969 the Arpanet – the world's first operational packet switching network, and the predecessor of the contemporary global Internet – was created by the Defence Advanced Research Projects Agency (DARPA) of the United States Department of Defence (DoD). In 1969 Michel Foucault envisaged in his text *Qu'est-ce qu'un auteur?* the death of the traditional concept of author and he talked about discursive "nappes", whose the author would just be the initiator[34]

In the rest of this section I will introduce Aarseth's idea of a *cybertext* compared to Hayles' definition of *technotext*, Bootz's *transitoire observable*, and Wardrip-Fruin's designation of *surface* and of *tale-spin* process. On one hand, all these concepts try to identify and describe the electronic text, approaching this object from a common point of view: the medium; but on the other hand, each of them highlights different elements that seem to be important in the analysis of electronic poetry.

3.1.1 Aarseth's Cybertext and Hayles's Technotextx

Aarseth coined the term ergodic literature to describe a literature where:

> nontrivial effort is required to allow the reader to traverse the text. If ergodic literature is to make a sense as a concept, there must also be nonergodic literature, where the effort to traverse the text is trivial, with no extranoematic responsibilities placed on the reader except (for example) eye movement and the periodic or arbitrary turning of pages.[35]

Aarseth's cybertext theory is a prospective on textuality in general – as he himself states – and in fact he also analyses printed texts which, however, present *cybernetic* characteristics. According to him, the concept of cybertext is not limited to the study of electronic textuality, as the definition of ergodic does not refer only to electronic text. In cybertext theory the text is seen as a machine producing and consuming signs consisting of the medium, the operator and the strings of signs[36]. The strings of signs are divided into *textons* (strings of signs as they are in the text) and *scriptons* (strings of signs as they appear to the reader). *Textons* reveal *scriptons*. The way in which they do it is called a traversal function which is described as the combination of seven variables:

> 1. Dynamics: In a static text the scriptons are constant; in a dynamic text the content of the scriptons may change while the number of textons remains fixed (intratextonic dynamics), or the number (and the content) of textons may vary as well. […]

2. Determinability: This variable concerns the stability of traversal function; a text is determinate if the adjacent scriptons of every scripton are always the same; if not, the text is indeterminate. […]
3. Transiency: If the mere passing of the user's time causes scriptons to appear, the text is transient; if not, it is intransient. […]
4. Perspective: If the text requires the user to play a strategic role as a character in the world described by the text, then the text's perspective is personal; if not, it is impersonal. […]
5. Access: If all scriptons of the text are readily available to the user at all times, then the text is random access (typically the codex); if not, then the access is controlled. […]
6. Linking: A text may be organized by explicit links for the user to follow, conditional links that can only be followed if certain conditions are met, or by none of these (no links). […]
7. User function: Besides the interpretative function of the user, which is present in all texts, the use of some texts maybe be described in terms of additional functions: the explorative function, in which the user must decide which path to take, and the configurative function, in which scriptons are in part chosen or created by the user. If textons or traversal functions can be (permanently) added to the text, the user function is textonic. If all the decisions a reader makes about a text concern its meaning, then there is one user function, here called interpretation.[37]

Aarseth's approach describes deeply how cybertexts work, but as pointed out by Katherine Hayles cybertext theories do not take into consideration the specificity of media. It is true that there are forms of cybertexts in different mediums – particularly in printed and digital texts, for instance Italo Calvino's *Il castello dei destini incrociati* is a perfect example of printed hypertext – but it is also true that the digital medium adds possibilities and characteristics that cannot be found in the printed texts. According to Hayles, Aarseth's method is objectionable just because "it is blind to content and relatively indifferent to the specificity of media"[38]. Aarseth's analysis focuses on theory and not on the content, but I do think that the content is necessary to understand the specificity of the medium, and how this specificity influences the content.

Katherine Hayles insists on the necessity of studying the specific materiality of the support or better she suggests the MSA – Media Specific Analysis. Hayles argues that a text's instantiation in a particular medium shapes it in ways that cannot be divorced from the meaning of its "words (and other semiotic components)"[39] and calls for the need to develop a theory that takes into consideration the medium as a crucial aspect of the content of a work. According to Hayles:

> the physical attributes constituting any artefact are potentially infinite […]. From this infinite array a technotext will select a few to foreground and work into its thematic concerns. Materiality thus emerges from interactions between physical proprieties and a work's artistic strategies. For this reason, materiality cannot be specified in advance, as if it pre-existed the specificity of the work.[40]

Hayles defines technotext as "Literary works that strengthen, foreground, and thematize the connections between themselves as material artifacts and the imaginative realm of verbal/semiotic signifiers they instantiate"[41].

It can be argued that Aarseth's typology of media position offers us a richer map than Hayles' thematic schema of materiality, but for the purpose of this study the specificity of the medium appears to be one of the main points in order to understand how and if poetry is being *modified* by the "new" medium. Moreover, while Aarseth's typology provides also blank gaps that have to be filled in – a potential text that does not exist yet – the typology I will propose takes into consideration only the existing different forms of electronic poetry. In order to do that I will consider the specificity of the digital medium and see if and how those characteristics mark the electronic poems.

The empirical study of e-poetry's actual content is fundamental in order to see if and how poetry is transformed by the electronic medium. The risk otherwise is to create an interesting theory that can approach different typologies of texts – like Aarseth's typology does – without completely *understanding* the specificity of the single typology. Taking into consideration the material aspect of the text and offering a descriptive and analytic approach to e-poems, close-readings, and a hermeneutic inquiry will

allow scholars to better comprehend the novelty of e-poetry and will help the reader to become familiar with poems deeply different from poems she is used to reading. The empirical approach, thus, will provide results that might be the starting point for a new discussion on the theoretical level and will perhaps make e-poetry less enigmatic for those who are not strictly from the field.

In order to do that I will focus on the materiality of the electronic poem and how this materiality interacts with the reader. These two aspects will be fundamental aspects in creating my typology. Philippe Bootz offers a stricter approach to electronic poetry. According to him:

> the 'transitoire observable' is the multimedia event that happens in the space-sound of the screen at the execution of the program of the piece. It is so named because this event constitutes "the transitory and observable state of the program in the process of being executed". It does not concern a technical state but a communicative and aesthetic state. […] The transitoire observable changes within time. The same program produces a different transitoire observable when it is executed in a different technical context or on a different machine, and this is true even when it consists of just basic description of what it can be seen on the screen.[42]

3.1.2 Bootz's Transitoire Observable, and Wardrip-Fruin's Designation of Surface and of Tale-Spin Process

Bootz states that concepts as ergodic literature, cybertext and technotext are useful, but they do not allow to capture the digital poetry in its whole.

> Their limitations are contained in their premises; they address literature by locating themselves exclusively from the point of view of the reader, as if he was the focal point of the work. This point of view might seem reasonable, and yet it has been proven that a number of works do not follow this mode, notably those of the French digital poets and, more loosely, most of the work produced by the writers and artists of the international collective 'Transitoire Observable'. In limiting themselves to this single point of view, the standard theories do not correctly describe the role that the machine plays, nor the exact purpose of reading. These theories consider the computer to be nothing more than an artifact that produces the visible component (that which is observed). For certain theoreticians, the semiotic layers and techniques overlap, as if the reader and the machine could form a new 'cyberentity'. This isn't correct in the case of digital poetry. The truth is at once more simple and more interesting: the technical artifact establishes a "semiotic gap" between two entities that can both be considered 'the' text, but not from the same point of view, in fact not for the same actors. Digital poetry today explores the role of language in signs that use this gap, and which only exist thanks to it. In this case, programming can become a new condition, a new context for poetic creation.[43]

Due to this "semiotic gap" Bootz divides the "text-auteur" form the "texte-à-voir":

> The fact that the program cannot be seen by the reader once it is executed constitutes another important technical fact. What results is that the author of the program has an overarching view of the work whereas the reader can only have a local understanding of it. This difference would not be present in a non-computer programmed work which calls on the reader to execute its instructions. It is thus important to distinguish the "texte-auteur" ("author-text") from the "texte-à-voir" The "texte-auteur" is constituted by what is written by the author, in a format that he can understand and manipulate. It contains, in a programmed work, the program he writes himself in the programming language (and not in the compiled binary file) and the givens that the author adds. The "texte-à-voir" is the part of the transitoire observable that the reader considers "the" text. For the same transitoire observable, it could differ from one reader to the next by virtue of the archetypes and mental schemes brought into play by the reader.[44]

As shown by Markku Eskelinen, in cybertextual terms this comes from Aarseth's distinction between textons and scriptons and the reader's lack of complete access to the former. Bootz's procedural model, in this case, matches with Aarseth's typology of textual communication[45]. In his essay *Understanding Digital Literature*[46], Wardrip-Fruin puts forward an alternative to Aarseth's "text, medium, and operator" triangle (see figures 2 and 3).
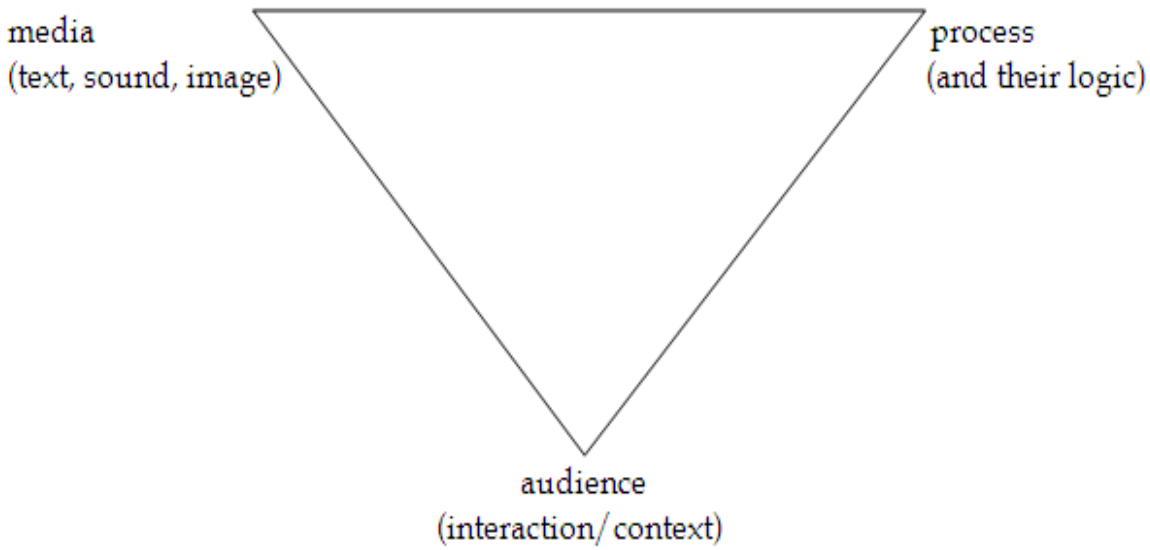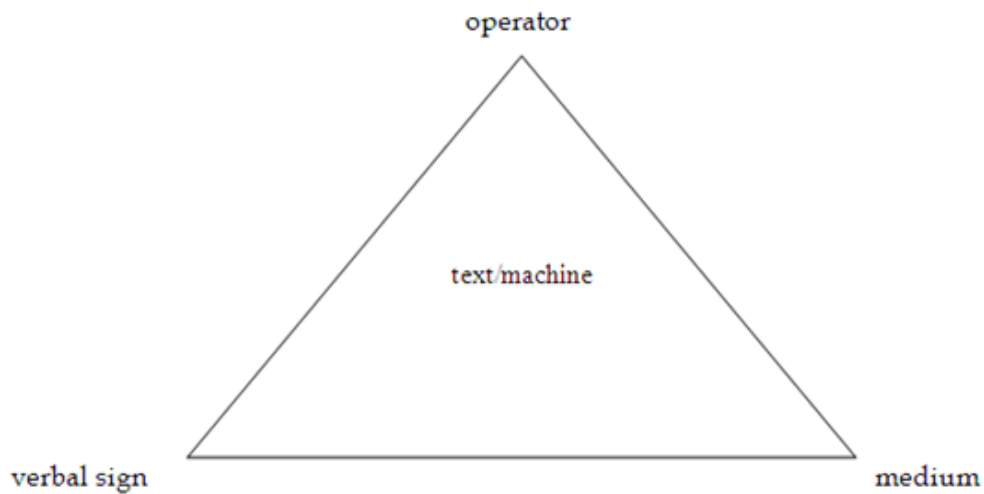
FIGURE 2: Wardrip-Fruin's triangle

FIGURE 3: Aarseth's triangle – Textual Machine

Wardrip-Fruin explains his model of digital literature starting from his idea of surface (and he visualizes a model of digital literature, see figure 4).

> All the works of digital literature are somehow presented to their audience – whatever on the teletypes, in web browser windows, through immersive installations, or by other means. If the audience is able to interact with the work, the means for this are also part of the work. I will call this site of presentation and possible (interaction) the work's surface. It may be as simple as a generic personal computer, consist of a large space or dizzying number of devices, or even take unexpected form (e.g, The Impermanence Agent makes all web browsing part of its interaction surface).[47]
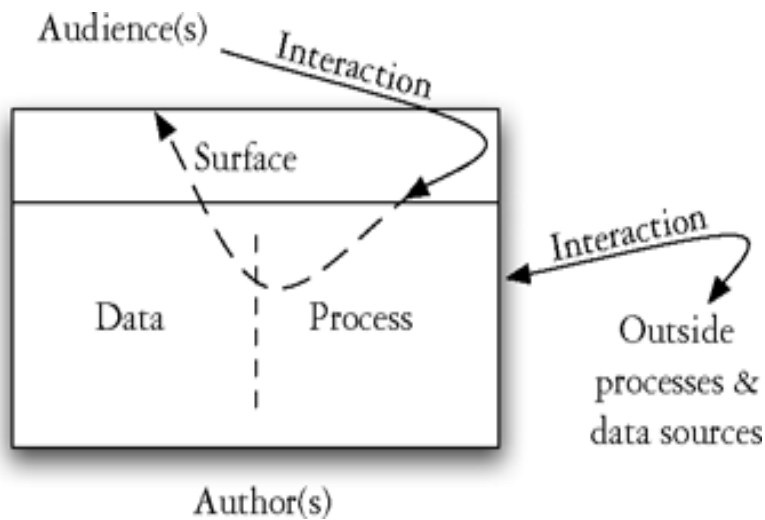
FIGURE 4: Noah Wardrip-Fruin, model of digital literature

He then explains his idea of interaction as "a change to the state of the work, for which the work was designed, that comes from outside the work. Given this the audience is not the only possible source of interaction"[48]. He finally produces another more complex model of digital literature, where he adds the concept of mumble/tale-spin processes[49].

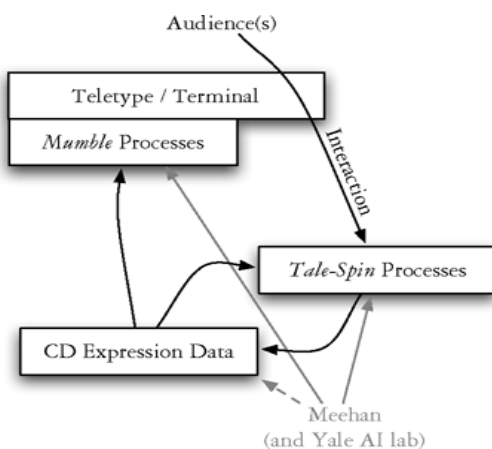Wardrip-Fruin proposes a model for the elements of *Tale-Spin* and *Mumble*.

FIGURE 5: Noah Wardrip-Fruin, the elements of *Tale-Spin* and *Mumble*

As demonstrated by Eskelinen, Wardrip-Fruin's *Tale-spin* processes correspond to Aarseth's simulation engine in which "the course of action is decided, based on the user's input, the cybertext's idiosyncratic rules, and the current state of the simulated world"[50] . Eskelinen adds that Wardrip-Fruin's "CD Expression DATA corresponds to Aarseth's database, *Mumble* processes correspond to the role of the representation engine"[51] which, according to Aarseth, presents "the results of the event to the user by providing a personal prospective on the simulated world"[52]. Finally Eskelinen identifies Wardrip-Fruin's Teletype/Terminal as being Aarseth's interface, pointing out that the only thing that Wardrip-Fruin adjoined is the author. According to Eskelinen, this model seems to be more useful for literary analysis and creation that for literary theory, since it focuses on the importance of the underlying processes normally hidden from the audience which makes this model more interesting for our purpose

Both Bootz and Wardrip-Fruin are particularly interested in the programmed/programmable level of electronic texts. And this is can be explained also because of their interest in generative writing.

Particularly Bootz has experimented generative poetry, and he has also co-edited since 1988 the review *alire* which is considered as the oldest digital-review in Europe. *Alire* has been particularly devoted to generative poetry. As we will see in section 3.3, Wardrip-Fruin thinks that is always necessary to study and consider the process (the algorithm) of electronic texts. Even though desirable, however, this aspect does not seem to be so relevant for many forms of e-poetry. The majority of the texts I analysed in my PhD thesis requires neither a deep understanding of coding nor an analysis of the process in order to be *appreciated*. On the other hand it would be important to also consider the process as part of the text as far as generative poems are concerned. In not considering the machine in the analysis of generative poetry I am aware that I omit an important aspect, but as already stated, my goal is to make electronic poetry *more readable* for both scholars interested into the subject and curious readers. The main interest and purpose of my study is to focus on the mutation of poetry, on the changes of its form, its structure, its rhetorical figures and tropes, and so on. And in order to do that – even if desirable – the analyses of the process does not appear to be necessary.

3.2 Technologization of the Expression Plan

The phoné is the designated unit of speech and spoken language: words must be articulated into the material of sound waves vocally or instrumentally[53]. Obviously, this is not the same when we consider the materials of written language. These materials are the result of a choice, more or less arbitrary, varying according to the knowledge and technical skills of a period or culture, but also depending on the kind of writing that one wants to produce. For this we can say that they are the result of the technologization of the expression plan.

This choice between different materials of expression represents a system of the writing support. Like all elements organized in a system of alternatives, the choice of the support that best suits connotations or genre of the writing object, translates into an extra sense. The value is then chosen according to the repertoire of alternatives that are available at one particular moment in the cultural history. For instance, deciding nowadays to write on a roll of papyrus adds a value of eccentricity that it didn't have to the ancient Egyptians.

The support is chosen according to the kind of discourse that one wants to produce. The material support, the implicit intention to the genre one wants to produce, as well as the gesture and the technique, should be imagined as three constraints that cross each other and determine one another. What one wants to express passes first through a genre of expression: religious, artistic, epistolary, ritual; and through of a type of substance: rocks, clay, textiles, and so on, which are arranged according to the code of the written language: graphic, pictorial, ideographic, syllabic or alphabetic. Since the code regulates the direction of the writing process, there are writings that develop horizontally (from left to right and vice versa) and writings that develop vertically (from the top to the bottom and vice versa)[54].

3.3 The Double Act of the Technological Writing

In addition to graphic or pictorial material, writing objects present a substrate that comes from their support and, as such, gives it an enunciative permanence outside the deixis – outside the "here-now" of the production.

There are two theories of utterance: an utterance of the spoken word and an utterance of the written word. The first is based on a combination of "I-here-now" of the illocutory practice, while the second is founded in the assumption of the producing existence. This act is lost in the past.

The writing object requires an utterance of the speech and an utterance of the support: the "I-here-now" of the discourse hardly ever coincides with the "I-here-now" of the support. A double act: the meaning's articulation starting from the constraints of language, and the supports' articulation, as the

material organization of the substrate of writing. The preparation and organization of this support constitute the conception of the writing space. The utterance of the text is taking place in this space.

During history the act of inscribing – that is the origin of writing – has evolved from the slowness of human gesture to the entrusted speed execution of the mechanical gesture. The typographical fonts – a gesture of mechanical writing – have standardized what, at the origin of writing, was the individual act of inscribing. The consequences of this transformation – the machine printing of fonts – was the deletion of subjective traces due to the manual production of the signifier. The individual act is overcome by the fonts' standardization and their arrangement on a homogeneous space[55].

Historically, this automation introduced by printing marked the end of the medieval copyists and lead us to technological reproducibility in large quantities. However, this mechanization of writing did not change the basic condition of the reading act that has been changed by the electronic medium.

After Gutenberg, writing is by definition a series of movable fonts printed on a support which fixes permanently its textual features. Electronic writing allows us – for instance – to modify page layout and to have mobile fonts.

According to Zinna, being "movable" is one of the main characteristics of electronic writing. He describes four kinds of mobility:

> a) an internal mobility; due to the composition's qualities. such as the import or the displacement of some or all its constitutive parts – text blocks, images, graphic elements - ; and b) an external mobility linked to the possibility of sending files away; c) a composition's mobility between documents that belong to different semiotic systems; and d) the possibility of rewriting the supports.[56]

Electronic writing behaves – sometimes – as an interactive object. Some electronic texts are at the same time objects of signification and object of action. This characteristic is also true for some printed texts such as for instance Queneau's *Cent mille milliards de poèmes* or Saporta's *Composition No 1* – just to identify two of the most famous interactive printed works. However, the kind of interaction allowed by the electronic medium differs from the printed one. In both media – printed and electronic – the action the reader is required to perform brings meaning to the text. But in electronic texts sometimes the reader does not just need to be active – solely to perform some actions on the text – but to be "inventive" and discover what action is necessary to read the text, and finally she can be asked to co-participate to the creative act, as in the collaborative e-poems. The reader's role must be taken into the consideration in the study of these texts because her function is changing[57].

Electronic writing also opens up other questions such as the importance of the code in the electronic creations. Where is the border between text and code? Is the technique part of the message in electronic literature? Do we also need to study the code? What we need to read when we read electronic literature? According to Wardrip-Fruin we need to read both data (words, images, and sounds) and process (algorithms and calculations carried out by the electronic work) in order to interpret and understand digital literature[58]. It can be argued that one does not need to know how to use the different painting techniques (watercolour, fresco, oil, and so on) in order to appreciate a painting. Raine Koskimaa points out three main scenarios the reader can be faced with:

> 1. There are many works for which you do not need programming knowledge at all; all you need to know is the basic usage of the computer (like using a web browser) to be able to read and enjoy the work;
> 2. There are works that only require installing;
> 3. There are works that require more profound understanding of the software environment. These include, for example, poems written in such a way that they work as executable code in certain programming language. These work can be categorized as a literary branch of "software art" or "code art.[59]

Koskimaa's scenario clearly shows us that the majority of e-poems do not require any particular programming knowledge, which seems to suggest that no advanced computer skills are required to

enjoy these texts. Moreover, different programming language can give the same aesthetic and poetic result. However, for researchers and scholars it will be desirable to better understand the code in order to be able to study certain e-texts deeper, but there is the risk that this knowledge can and will create a barrier in the study of electronic literature.

4. The Author, the Reader, and the Text

In the Western tradition authors have a duty: authors are responsible for what they say and write, the concept of intellectual property also give rise to issues of copyright and plagiarism. They also have a function. The author function, however, has changed with regard to the history of literary criticism and to the content of the work.

There was a time when a literary work could be read without recourse to some knowledge of who the author was. The history of literary studies since early times is replete with stories, folk tales, and epics that had no authors. Moreover, the kind of author called "the poet" was already for Plato not a trustworthy person. In *Ion* Socrates says that "the poet is a light and winged and holy thing, and there is no invention in him until he has been inspired and is out of his senses, and reason is no longer in him"[60]. Successively, the work and its author were one thing. In the 20th century, the author is viewed from yet different angles.

During the last century different approaches to the text have been adopted, particularly focusing on the text and on the reader. The first one puts the prime focus on the text which has to be analysed with established criteria, the second one focuses on the importance of the reader and their individual, subjective response to the text. From the New Critics, that stressed the creative literary qualities of the "primary material", to the Russian formalists (such as Roman Jakobson), to structuralism and post-structuralism, to deconstruction, every critical theory produced its own object of study, focusing on the formal aspects of the text.

The modern hermeneutic inquiry was elaborated by Friedrich Schleiermacher[61]. By emphasizing the role of the reader in the production of text's meaning, Schleiermacher prepared the way for later theoreticians of reading, particularly those focusing on the reader-response and reception. In his seminar essay "Linguistics and Poetics"[62], Jakobson defines the "poetic function" of language as that which promotes "the palpability of signs", which is to say that poetic language calls attention to its own medium. The literary text invites the reader to look at it. To Roland Barthes and Michel Foucault the author is dead. According to them, it is literature that creates the author. Besides, Foucault redefines the author-function as a set of criteria: "a standard level of quality", "a certain field of conceptual or theoretical coherence", "a stylistic uniformity", and "a definitive historical figure"[63]. The author is no longer a person. Barthes questions the idea that a text can be attributed to any single author. He states, in his famous essay "Death of the Author"[64], that "it is language which speaks, not the author".

What is the role of the author and the reader in an electronic poem? What action does the reader of an electronic text have to do in order to study, interpret, and *understand* it? Umberto Eco suggests that in electronic texts the abundance of interpretations depends both on the initiative of the reader, but also on the physical mobility of the text itself[65]. So the intrinsic nature of the digital text, the technologization of the expression plan, generates different reading paths.

The artistic (and cultural) production of the last century can be read as a weakening of the concept of the artist as the only person responsible of the work's meaning. Since the 1950s, in fact, we have observed the growth of two great trends that have followed the *upheaval* brought about by those technologies, related to the development of computer science. On the one hand, being interested in a new form of communication that is breaking with the mass-media model, a tendency that seeks to make the spectator take part in the development of the work appeared, by altering both the work's and

author's function; on the other hand, a tendency insisting more on the *production* than on the *product* and trying to deconstruct the creation's process in order to make visible the structure, the grammar. The first trend seeks to create new relationships with the audience, the second one focuses on the creative practice.

What does it mean to associate the spectator with the creation? At the beginning, it meant to bring closer work and spectator. According to Frank Popper, in art the essence is no longer the object itself, but the dramatic confrontation between the spectator and the perceptive situation [66]. Finally, can we suppose that the "spectator/reader", called to participate in the work's *writing process*, could become herself a program of the work?[67]

5. The Reader's Action

Electronic writing is characterized by being interactive. Actually, not all electronic texts are interactive, however, allowing the reader to manipulate the text is one of the main possibilities that the electronic writing offers to its reader. According to different forms of the expression different action are available to the reader. For instance, with hypertext the reader explores the text, she decides her own path though the iconographic and textual material. Like this the reading practice – described by Peter Stockinger as a cognitive activity of textual selection and production of information[68] – does not seem merely to be reduced to a mental process but according to Alexandra Saemmer "elle laisse parfois des traces matérielles"[69].

5.1 The Digital Reading Practice

The critics in the last decades have underlined the strict collaboration between author and reader and have ended up with talking about "textual co-production"; sometimes in the electronic text this co-production seems to become palpable. According to Saemmer "dans certain nombre d'approches critiques des phénomènes de lecture numérique, les frontières entre *écriture* et *lecture* ne sont donc plus tracées avec exactitude: l'hypertexte serait non pas à lire mais à écrire"[70].

Before the hypertext became a new structured tool to spread knowledge, poets, writers and philosophers had already thought of texts that could be opened to the reader's interaction. In *S/Z*, Ronald Barthes defines the reader as a "producteur du texte"[71]. George Landow uses these new definitions of the reading practice as the starting point for his theory on hypertext[72]. Landow and other critics, like for instance J. Bolter, have probably been too enthusiastic in knitting together those theoretical thoughts of last century and these technological innovations but the transformation of the reader's and author's roles demonstrated by the critical theory and philosophy needs to be taken into consideration when speaking about a new reading practice on a new medium.

According to Eco – among others – hypertext is not simply a knowledge system but a "meta-knowledge" system, since by chains click on the links the reader constructs her own meaning – path out of all the other meaning-paths built by other authors. Eco points out also that there is a difference between texts that can be produced and modified infinitely and texts already produced that can suggest infinite interpretations but they keep on being physically finite texts[73].

Hypertext author/theorist Michael Joyce identifies two typologies of hypertexts: "exploratory hypertexts" or "constructive hypertexts". Exploratory hypertexts provide as navigational devices that assist the user in finding and collating information. Joyce describes constructive hypertexts as those that:

> require a capability to act: to create, to change, and to recover particular encounters within the developing body of knowledge […]. These encounters, like those in exploratory hypertexts, are maintained as versions, i.e., trails, paths, webs, notebooks, etc.; but they are versions of what they are becoming, a structure for what does not yet exist.[74]

The majority of critics, however, agree that hypertext requires a more active reader: "hypertext gives the reader a more active role than is possible with books"[75]. Suzanne Bertrand-Gastaldy goes further and says that: "le lecteur peut devenir non seulement très actif, mais aussi très créative et à participer à cette 'porosité' croissante entre lecteurs et auteurs"[76]. Eventually, Alexandra Saemmer wonders if the activation of hyperlinks is still a reading practice, or if it isn't already part of the writing practice:

> Considérant la mobilité de cette frontière sur support numérique, il faut donc se demander si la navigation (l'activation des liens hypertexte) elle-même est encore une activité de lecture, ou si elle relève déjà de l'écriture.[77]

Electronic writing, however, experiments with different kinds of writing, thus the reader in the digital environment does not only "read" hypertext/hypermedia, but also other forms of creation which reveal dynamic elements.

5.2 The User's Position

In his work on cybertextuality, Markku Eskelinen advances a typology focusing on the user's position in relation to the text. The user's position is determined in relation to other users, their physical location, body movements, and the user's point of view with respect to the scripton space:

> a) Autonomy. If the user's possibilities to use and realise the text are completely independent of other users (either previous or simultaneous ones or both) his or her position is independent; if not it is dependent. *TinyMud* and *Norisbo* (Strand 1992), included in Aarseth's selection, exemplify the latter position. *Moby Dick* (also in Aarseth's selection) the former.
>
> b) Mobility. Some texts such as *Her Long Black Hair* (Cardiff 2005) and *Astray in Deimos* (Kac 1992) require body movement from the user as a necessary condition for their realisation, while many others do not. Thus there are two basic positions: stationary and non-stationary.
>
> c) Point of view. This variable describes whether the user is able to see the entire presentation area or scripton space at will (omnipresent) or whether he has to change and adjust his prospective in a non-trivial way to do so (vagrant). In David Knoebel's *The Wheels* (1999) the user has to zoom in and out of three-dimensional scripton space he can't see in full (except in the beginning), while the readers of *Moby Dick* will have the page (as a scripton space) in their full view all the time.
>
> d) Positioning. This variable describes whether the user's possibilities to use and access the text require him to be in a specific physical location (localized text) or not (not-localized text). Some texts require the user to be in a specific location (such as a CAVE or Central Park) to access and realise the text while others do not (you can read most books everywhere).[78]

The "User's" Position and Electronic Poetry

1. Autonomy. In electronic poetry the user is invariant, the reader often needs to interact with the text, but any one reader is not dependent on any other reader. There are, however, some exceptions: collaborative e-poetry and many installations are examples of this case. *Re-read*[79] by Simon Biggs is an installation that has its own realisation only thanks to the "reader's" interaction, but many readers can interact simultaneously; in collaborative poetry the reader becomes author altering the text she has just read, thus the text depends on .previous readers.

2. Mobility. The gesture of the hand touching the text through the mouse is the most common and simplest body movement that e-poetry makes use for the realisation of texts, such as for instance in Daniela Calisi's *Stillicidio*[80], but many installations require/allow more complex body movements as in Biggs' *Re-read* or Camille Utterback's *Text Rain*[81], which responds to the users' movements.

3. Point of view. Many e-poems do not allow the reader to see the scripton space. Some of them require the reader to zoom or to rotate the text or to navigate through it as in Chico Marinho's *Palavrador*[82].

4. Positioning. E-poetry requires a computer (and often internet access) to read it, or CAVE/museum/gallery/and so on if it is an installation. Nowadays, however, thanks to notebooks (and Wi-Fi) and now also I-Pad it is possible to access most e-poetry everywhere.

5.3 The Reader and the Levels of Interaction

According to Zinna, there are eight interaction levels in what he calls electronic documents (electronic texts). He identifies the interaction levels of electronic documents as those that establish the *qualitative* interaction of the document. He distinguishes between the interaction's level and the interaction's extent which refers to the *quantity* of links for each electronic document in its whole[83].

Zinna describes the different actions the reader can/has to do with the electronic document in order to make it up:

a) the reader/user can click on the links that are presented in a linear way; in this case she advances in the only possible reading direction;

b) the reader/user clicks on links that give her alternative paths; in this case her role is a bit different compared with the previous one since she can decide the reading direction according to different alternatives;

c) she can write some blocks of text in the spaces arranged for that, for instance as commentary; in this case her role is closer to an author's role;

d) she can erase some parts of the document; also in this case her role is similar to an author's role;

e) she can create links between two blocks of text; in this case she creates associations between different parts;

f) she can erase links between two different blocks of text; in this case she denies any possible associations between the parts;

g) she can create text and links, but not erase them;

h) she can create and erase both text and links; in this case her role is the same as the author.

As pointed out by Zinna, it is only under those extreme forms – which are still very rare – that interactivity makes the reader to be a true co-author of the electronic document[84].

As regards electronic poetry, the two first forms are the more common. The last form is rare but represents a new experiment in the field of electronic poetry: collaborative poetry[85].

6. Typology of E-poems

In this section I will advance a possible typology of electronic poetry. The term electronic poetry shelters different forms of poetry fashioned from our digital support under its umbrella: from hypertextual poetry to installations, from generative poetry to poetry which has images and sound in the text, from animated poetry to video-poetry. Even though sharing the same digital medium, the spectrum of possibilities is vast.

Other typologies already exist. According to Loss Pequeño Glazier hypertext, visual/kinetic poetry and works in programmable media are the "three principal forms of electronic textuality"[86]. This typology is the most common categorization of e-poetry, but it is too general and it does not really take into consideration some innovative aspects of e-poetry, However, many theorists use this typology to describe e-poetry subgenres.

Mary-Laure Ryan in her article "Narrative and the Split Condition of Digital Textuality" compares what we would call electronic literature (e-poetry, hypertext fiction, and so on) to video-games, and she gives a typology for e-poetry ("code poetry, visual poetry, experiments in computerized text generation"):

> [i]n digital textuality, the North Pole is represented by hypertext fiction, code poetry, visual poetry, experiments in computerized text generation, browser art, and theoretical fiction, while the Tropics are invaded by the millions of people who spend a large part of their lives playing computer games […].[87]

In the above categorizations, nevertheless, phenomenological aspects such as the modes and nature of interaction with the e-text are not a distinctive feature (and besides not only hypertextual text is interactive). The putting together visual and kinetic poetry – as in Glazier's typology – is a practice derived from avant-garde tradition, kinetic in this typology seems to substitute for in some way concrete poetry – particularly because it was concrete poetry which was the first poetry to put movement in its creations, thus becoming kinetic. However, visual poetry can be also connected to hypertextual/hypermedia construction, and both visual and kinetic poetry can be either interactive or not. Ultimately programmable media (or generative poetry) involves interesting questions such as the figure of the author, but as far as their forms of expression these e-poems reproduce characteristics already present in the other typologies, for instance a generative poem can be kinetic.

I shall consider two aspects of the digital text that seem to me particularly interesting: the question of time and the modes and nature of interaction of the reader. It is true that also the printed word allows the reader to "interact" with the text, but it is also true that the interaction allowed by the digital medium is of a different kind entirely and that it can push forward this kind of experimentation – it can allow the reader to write/erase/rewrite parts of the text, or to become part of the text like for instance in Simon Biggs' *Re-read*, in which the reader can physically get into the text, and see her image in the work.

The question of time is an innovation that the digital medium introduces to the reading practice and puts electronic literature closer to the movies in this respect. According to Markku Eskelinen:

> reading time is not only unverifiable (and conceptually useless) in print fiction, but there are also no effective. [...] As digital text can be programmed to react to the reader way they are being read and to set conditions upon the reader and the reading process, a new dimension of constrained reading and programmed has opened up.[88]

Print literature cannot effectively control reading time whereas electronic literature can be programmed to effectively control reading time (see for instance *La Rossa Parola* by Elisa Carlotti[89]).

6.1 E-poems: Segments-based E-poetry, Sequence-based E-poetry, Hypertextual E-poetry, and Hybrid E-poetry

E-poems classified around texts built on the concept of the link we shall call hypertextuality; and around digital poems composed of morphological elements which, we specify to be: a) segments which are morphological elements without an inner clock/an inner temporality, such as text blocks, images, and so on, or b) sequences which are characterized, on the contrary, by some inner clock/temporality, such as video, animation, game-worlds and so on[90].

I am using semiotic morphological categories[91] without ignoring previous possible categories, like kinetic text. Aarseth provides a quite similar distinction: "transient text" (user-controlled times) and "intransient text" (text-controlled time), but I have decided to use semiotics which already offers us a vast terminology (which perhaps needs to be adapted a bit when applied to electronic texts). Moreover Aarseth's typology – in its whole – produces 576 different combinations, which all differ from each other. It is certainly true that his typology is more accurate and that it takes into consideration all

possible nuances that the electronic medium can offer to text; however, as it has been noticed, it can also be problematic since it introduces around 600 different text forms.

In my typology, I have decided, also, to add a sub-type of sequence-based e-poetry, since some e-poems allow the reader to manipulate, after a fashion, the order of the sequence(s) of the e-text: I propose to call this kind of e-writing "random access sequences", as opposed to the strictly sequential nature of regular elements. I am using computer science's terminology where random means "accessed in any order", and not in the layman's sense of, say, "chaotically" or "all over the place". Then, there is one last type of text which I have called hybrid e-poetry because these e-poems exhibit the characteristics of more than one type.

By introducing the notion of ordered time into the text, sequenced-based e-poems are thus also seen to be kinetic. Kinetic poetry is normally the category used to identify poetry which exhibits movement in and of its construction. The word "kinetic" derives from Greek *kinetikos* "moving, putting in motion" - from *kinetos* "moved" verbal adjective of *kinein* "to move". The word kinetic first referred to art to designate that art which contains moving parts or depends on motion for its effect. Visual and Concrete poetry experiments have introduced motion to poetry too.

Heretofore there has been no clear distinction between texts in which the motion is activated by the reader/user and texts in which it is automatic. According to our approach to e-poetry, however, this distinction is important.

The fact that the text can be altered, is one of the characteristics of digital literature in general and digital poetry in particular. In kinetic works poems are transformed under the reader eyes due to movement of and within the text. This motion proposes new meanings to the reader and creates new figures and tropes. Even though not all segments-based e-poetry can be considered kinetic, some of them are built on the idea of movement, for instance Aya, Karpinska's famous cubes (the motion is activated and stopped by the reader and controlled by her) . The typology thus contains[92]:

a) Segments-based e-poetry: built on morphological elements without an inner clock, they can be either static or dynamic, if dynamic the motion requires the reader's action.

b) Sequence-based e-poetry: built on morphological elements with an inner clock, they are always kinetic texts. Because of this inner clock they exert a control over the reading-time.

c) Hypertextual e-poetry: built on links, this kind of e-poetry is derived from the hypertext genre.

d) Hybrid e-poetry: this category exhibits the characteristics of more than one type of e-poetry.

6.2 Ergodic Time

It is important to point out that according to Aarseth's definition of ergodic literature sequence-based e-poetry does not generally require trivial efforts in order to be read, in a way it presents ergodic reading time or reading time that requires a non-trivial effort to navigate within. Sequence-based e-poems are often programmed to react to the way they are being read. According to Eskelinen, if we take into consideration the three traditional aspects of time, specific constraints can affect the speed (how fast or slow the text can/has to be read), the duration (how long it is possible to read the text), and the reproducibility of reading (how many times it possible to read the text)[93]. Even though Eskelinen's study concerns narratological time, it is also true that the advent of motion and consequently of temporality in electronic poetry has allowed it to easily tell a story. In particular sequence-based e-poetry and hybrid e-poetry are concerned by the introduction of temporality into poetry.

All of the three traditional categories of time can be altered in e-poetry. The speed of reading, for instance, can be limited: the text or parts of it can move too fast to be read by the reader. As for the

duration, the length of the text cannot have any relationship to the time given to the reader to read it. This may lead to (forced) incomplete readings. Finally, the reproducibility of reading: it may not be possible to reread the text all or some of its parts as they were before, thus the reader reads another text effectively. This manipulation of the time alters the reception of the e-poems and proposes incomplete readings or different readings (due to either different texts caused by a change in the reproducibility or differing reader's skills in reading with respect to a predetermined allotted time). Differentiated or unaccomplished readings are not normally accepted practices for reading "serious" poetry (the same circumstance is valid also for "serious" fictional narrative).

There is also a distinction that concerns the system time and the reading time, since their setting can be different, although reading time depends on system time. If the text's duration is one hour reading time can be either equal to or less than one hour; if the text can be read just twice the reader can choose to read it either once or twice; and if the text will self-destruct after 100 accesses by any reader it would be very hard that one reader could read it 100 times solely.

6.3 The Reading Practice of E-poems

In this section I will introduce a typology of e-poems while focusing on the reading practice. Adding this typology to the previous one, a typology based on two axes can be built up in order to map the world of electronic poems.

All the categories of this typology under our concern – the reading practice – take into consideration the "meaning's construction" in interpreting any kind of text. What I want to focus on is which kind of reader's actions are involved in the reading practice. It is important to clarify now that since I am talking about a reading practice I prefer to call the "reader", "reader" and not to use alternative terms like for instance "user". I prefer employing the term "reader" to "user" – thought sometimes this term will be utilized – because the reading process is still involved in the electronic poetry, even though at a different level and manner perhaps.

There are a number of alternatives to both "reader" and the more frequent "user", some theorists have suggested other terms, such as *interactor*, *wreader* and *vuser*. *Interactor* (Douglas 1996; Murray 1997) is intuitively meaningful, but it is not always true that the reader interacts with the text. In the early nineties, many argued that the reader of a hypertext became a co-author of the text, and this writer-reader was, for a while, called the *wreader* (Landow 1992; Landow 1997; Rau 2000). The *wreader* in Landow's idea refers to hypertextual writing, but as shown some e-poems are not hypertextual. So this term should be used when the action of reading and writing are interacting with each other in order to make the text (which is actually true even in works that are not hypertextual works). *Vuser* is a similar linguistic compound, but more visually grounded, being constructed from the words viewer and user (Seaman 2000), and it is true that images are very important in e-poetry and often even the letters acquire a visual meaning, but generally e-poetry still needs the action of reading, that is to say "to look at carefully so as to understand the meaning of something" which is generally written, but not only that since "to read" means also "to make out the significance of by scrutiny or observation" such as for instance "to read the cloudy sky as the threat of a storm"[94].

As mentioned in section 4.1, Michael Joyce identifies two typologies of hypertexts: "exploratory hypertexts" and "constructive hypertexts". These categories can also be adopted to classify e-poems that are not built on links, that are not hypertextual. I propose 4 different categories focusing on the reading practice, starting from a "degree zero" of interaction up till the possibility given to the reader to become herself co-author of the text.

a) Read-only Text. I am adapting Philippe Bootz's term (see section 3.1.5) and using it in a narrow sense: according to Bootz the "texte-à-voir" is the part of the transitoire observable the reader

considers "the" text and it is different from the text the author can "see". I propose to use this term in order to describe those texts that are actually "à voir", since they neither require nor allow any user's significant action, besides – sometimes – activating the text, stopping and restarting it. The reader can just "read" these texts. Sometimes she can stop the text and go back, if she misses some parts, or access it "in any order", which is normal in e-poetry made on video (see for instance Alex Gopher's *The Child*[95]). Sometimes, however, not even this simple action is allowed, and the text flows without pause. In this case the reader is even less free than with books, since she cannot stop reading the text without restarting it from the very beginning.

b) Exploratory texts. In these texts the reader "explores" the work, choosing among different reading paths – like in hypertexts (and thus making associations among them) – or moving through 3D space following different directions in order to materially explore the text (see – for example – Chico Marinho's *Palavrador*).

c) Combinatory texts. From Ramon Llull to Juan Caramuel y Lobkowitz's *Metametrica*, (1663), from Giardano Bruno and Gottfried Leibniz's *Dissertatio de arte combinatoria* (1666) to the more recent experiments texts by Queneau and Calvino the *ars combinatoria* have always fascinated writers (and indeed not only writers). In e-poetry there are many examples of combinatory texts, especially if they are also generative text, which means created by the machine. Theo Lutz's *Stochastic Poems* (1959) and Nanni Balestrini's *Tape Mark* (1961) are examples of generative and combinatory e-poetry. Florian Cramer created in 1998 a codework machine that reproduces in digital form many of the famous combinatory systems[96].

Even though it is difficult to distinguish combinatory poetry from other forms of poetry ever since linguistics defined language as a combinatorial system itself – I propose to use combinatory poetry to define those texts that openly expose and address its combinatorics by changing and permuting the text according to fixed textual structures given by the author, that allow/need to be recombined to take on meaning.

d) Constructive texts. According to Michael Joyce these kinds of texts "require a capability to act: to create, to change, and to recover particular encounters within the developing body of knowledge […]"[97]. This category defines texts that require the reader's explicit input in order to have a text. The reader can either work on her own text, tracing it (as for instance Maria Mencía's *Vocaleyes*[98]) or write jointly with other readers (that most probably she does not know at all) in the construction of a collaborative poem. In this case sometimes the reader is allowed not only to write but also to erase the text, thus her role is the same as the author – she can be defined as a real "wreader". Already exploratory and combinatory e-poetry are proposing this new figure called "wreader", a mixture of writer and reader, since the reader not only reads (and interprets the text) but after some fashion she can act on it, developing a subjective – often unique and unrepeatable – reading path, but in constructive e-poetry the reader is taking part of the creative process: she can write, erase and re-write the text.
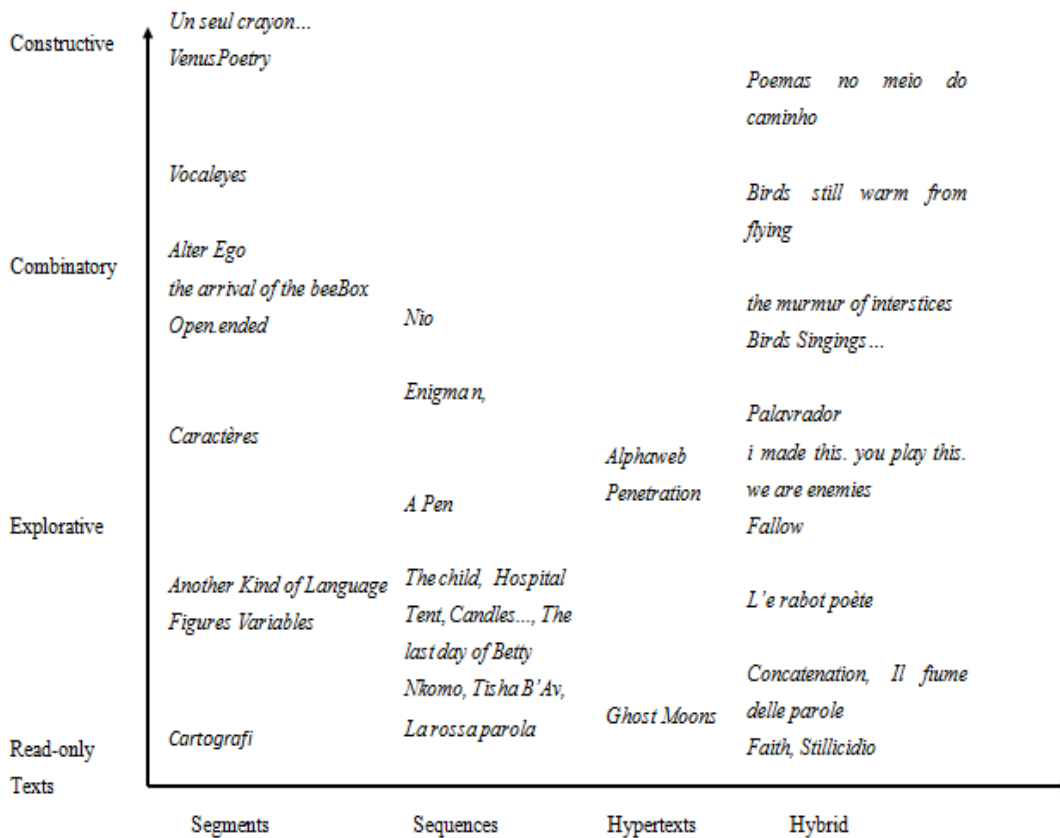
	Segments	Sequences	Hypertexts	Hybrid
Constructive	*Un seul crayon...* *Venus Poetry*			*Poemas no meio do caminho*
	Vocaleyes			*Birds still warm from flying*
Combinatory	*Alter Ego* *the arrival of the beeBox* *Open ended*	*Nio*		*the murmur of interstices* *Birds Singings...*
		Enigma n,		*Palavrador*
	Caractères		*Alphaweb Penetration*	*i made this. you play this.* *we are enemies*
Explorative		*A Pen*		*Fallow*
	Another Kind of Language *Figures Variables*	*The child, Hospital Tent, Candles..., The last day of Betty Nkomo, Tisha B'Av,*		*L'e rabot poète*
Read-only Texts	*Cartografi*	*La rossa parola*	*Ghost Moons*	*Concatenation, Il fiume delle parole* *Faith, Stillicidio*

FIGURE 6: Possible typology of electronic poetry

7. Aesthetic of E-poetry: Space, Motion, Rhetorical Figures, Tropes, and Entax

The question of an aesthetic in digital environments has several facets. As Steven Johnson points out we do not engage with the zeros and ones of the digital code, but we relate to the digital support via an interface, which Johnson defines as "a kind of translator, mediating between the two parties, making one sensible to the other"[99]. Andrew Murphie and John Potts in their book on *Culture and Technology* pose the question of a digital aesthetic in terms of "the transformation of our sense perception by (the 'hidden') digital through various interfaces"[100]. They argue that it is not clear what a digital aesthetic is, but "there seem to be lot of it around, and it seems tremendously diverse"[101]. According to them:

> [t]he digital aesthetic focuses not upon an eternal idea of art or beauty, but upon an endless transformation of our sense perceptions through digital technologies […] Yet we should begin by saying that there is certainly no definitive approach to the digital aesthetic.[102]

Kant's conceptualization of aesthetics suggests that we should seek in art exactly what is not engrossing, what does not engage us completely as what we already are, but rather what might allow us to find us another way of being human.

According to Sean Cubbit "[t]he aesthetic is [the] pursuit of an ethical mode of being in despite of the conditions in which we find ourselves"[103]. He carries on saying that:

> [t]here is some kind of absurdity in looking for ethics in a technical device […]. The fastest and the widest impact that computers have had is in deepening the class structures of contemporary society on a global scale. We had to confront the demolition, not just of jobs, of communities and of cultures, but of hope itself as a direct or indirect

effect of the electronic communications that have enabled the entirely destructive expansion of financial capital. How could we find an artwork as complex, as effective, as engrossing as the worldwide nexus of transnational capital?[104]

Computers and the internet are nowadays our partners in life, we cannot live without them, and if we live without we will be somehow cut off from modern society – already in the '90s Umberto Eco talked about the world divided into two groups of people: people that could/will be able to use computers and the internet and those who could not. We live in an information society[105], surrounded by communication technologies. What does electronic poetry bring to the society in terms of understanding our "post-modern" culture? Many 20th century avant-garde's movements have already subverted the aesthetic sense and tried to make arts and poetry more popular and more related to reality and everyday life. What kind of new aesthetic does e-poetry propose?

In the *Tractatus*, Wittgenstein addresses the question of the limits of language and the more particular question of what there is (or is not as the case may be) beyond language. Wittgenstein asserts that "the world is all that is the case"[106] and when "reality" is laid up alongside "propositions" it is the form of propositions which determines the shape of reality (and not the other way round). Adorno states that "[w]hat is essential about a work of art is not the case". How should we approach electronic poetry, in which codework, generative text, time and motion are pushing the language to its limits, sometimes making e-poetry unpredictable and random?[107]

7.1 Ergodic Space: Pagination, Motion and Entax

The space offered by our recently fashioned digital support is a new space, a space freed from the constraints imposed by the printed word. Both the author and the reader can manipulate, transform, interact with this space in order to create poetry. This new space allows us to easily connect words and images, to see them in 3D, to have motion and the introduces the notion of time to the text and, finally, the possibility of adding sound: all these elements are easily parts of an electronic poem.

This space is extremely different from the space of the printed page. Even though many poets and writers have exploited the potential of the printed page, reorganizing the elements on it, it has been common use to organize the page according to predetermined rules. For instance, white-space between words and between blocks of text creates aesthetic balance and it also make the text readable; furthermore in poetry these spaces have often the metaphorical meaning of silence.

In e-poetry the use of different colours both for the background and for the text is quite normal, what kind of effect does the possibility of easily colouring the writing space cause? For instance, colours can identify a command, or they can be a trace of the reading path as in hypertexts where often the clicked on element is differently coloured to begin with and after been clicked it changes its colour to something else again marking that the link as having already been accessed.

7.1.1 Typography

Typographic and pagination characteristics largely go unnoticed in linguistics as far as the process of generating meaning is concerned. Linguistics seems simply to deny the importance of graphic elements. Linguistics refuses to acknowledge the typographic field as a semiotic mode. In their view, writing is secondary to speech, merely an instrument for encoding spoken language. Consequently, linguists have concentrated on the phoneme-grapheme correlations in different languages and on the nature of various writing systems, but have ignored the individual variability of sign tokens. Saussurean-style linguists have also erroneously focused on the sentence or smaller linear units of language and thus failed to understand the spatial nature of text on the page and its organizing effects[108].

It is only the more recent semiotic trends in text linguistics and stylistics[109] which have recognized the capital function of typography. As it is known the meaning can be constructed with the help of several sign systems. Typography can be seen and studied as a code in its own right. It contributes and influences the textual meaning in various ways.

In electronic poetry both the materiality of the medium and the materiality of the text are crucial aspects to capture the meaning of the story. Consequently, it appears to be important to analyse the typographic aspect of poems. It is immediately evident that kinetic poetry, poetry with motion, for instance, is obsessed with technical mediation. This media-techné is not merely a stylistic form, but it shifts within the function of the poetry itself.

7.1.2 Entax

In Barthes's sense, writing can be called a connotative sign system as it uses content-form combination of a primary system (language) as signifiers in a second sign system (typography)[110]. So it is important that readers decode graphic signs in order to make linguistic meaning: graphemes into morphemes into lexemes, etc. By using typography, form can be illustrated or suggested.

The three types of signs, following Peircean semiotics[111], can correspond to three levels of typography: reading is mainly a "symbolic" act (deciphering conventional signs) but it can acquire indexal and iconical qualities. In electronic poetry, often, typefaces point out the nature of the text, carrying emotional weight.

Particularly in electronic poetry, typography seems tied to various linguistic and pragmatic levels of an utterance. It can comment on or reinforce verbal messages in the text. Thanks to the spatial arrangement of lines, text forms blocks on the page and thanks to additional typographic elements, readers access to different meaning levels of the text.

Jim Rosenberg underlines how in electronic literature space is strictly connected to prosody. In linguistics, prosody studies the rhythm, stress, and intonation of speech. Prosody has to do with time more than with space. It is particularly important in poetry but also in prose and it may reflect various features of the speaker or the utterance: the emotional state of the speaker; the form of the utterance (statement, question, or command); the presence of irony or sarcasm; emphasis[112]. Rosenberg shows that in electronic literature the possibility of easily editing the space and the words in the space choosing different typographies offers new possibilities to prosody as well. Syllables can be manipulated and like this they can mark, highlight, mimic a pause, and so on[113].

I use a semiotic term – entax – to analyse the form, the structure, and the typography of e-poetry, to build a syntax of electronic space. Entax is concerned first of all with typography and pagination, thus it can be useful in the analyses of printed work as well (such as for instance concrete poetry), but the concept and construction of "entax" I would suggest is more related to e-poetry since it takes into consideration motion which is one of the characteristics of electronic texts.

Briefly, in semiotic terms, if syntax covers the assembly operations of both figures and signs along the external space of a sign system, entax indicates the system of the operations that assemble the letters inside the figures. The syntax regulates the grammatical relationships between the linguistic signs; the entax takes into regard the mutual relationship that is created between the characters in an inscribed space. I divide the entax according the typology of syntax:

· Micro-entax (morphology) which refers to fonts, letters and to the configuration of typographic signs in lines and text blocks, it deals with the morpheme – like for instance words' forms, colors changing, and so on.

· Meso-entax (semantic) which relates to the graphic structure of the entire document, it deals with the lexeme – like for instance recreating an image with words as with calligrams, or reproducing a movement with words.

· Macro-entax (pragmatic) which relates to the graphic and visual structure of the whole document, it deals with the sentence in its context – wherein a second meaning is suggested.

In all these categories motions can contribute to the effect of sense.

7.2 Rhetoric Media Figures

The possibility of moving about the text in its entirety or parts of it, is one of the fundamental innovations that e-poetry brings to poetry. E-poetry can set words in motion, words let loose in a physical sense. The motion of the text and the reversibility of it allow the creation of new poetical figures. Critical analysis highlights the use of particular poetical figures which are typical of electronic poems. Alexandra Saemmer identified some new media figures, applying classic rhetorical figures to aesthetic effects that motion can provoke.

· Interfacial retroprojection. The interactive gesture, the activable media content and the activated media content get into metaphorical relationships.
· Interfacial neantism. The interactive gesture does not provoke any effect on the screenic surface.
· Interfacial incubation. The interactive gesture provokes effects on the screenic surface, which although emerge so late that it is difficult for the reader to establish a relationship between his gesture and the effects.
· Interfacial involution. The interactive gesture invariably displays the same media contents; the inter-actor go round in circles.
· Interfacial sporulation. The interactive gesture, supposed to provoke the emergence of a single pop-up, provokes the emergence of a multitude of windows; the interactor loses his control over the interface.
· Interfacial pleonasm. The interactive gesture does not provoke the emergence of additional information; the message is redundant.
· Interfacial randomization. The interactive gesture provokes the emergence of other media contents according to a random process.
· Interfacial antagonism. The interactive gesture provokes the emergence of media contents contrary to the contents announced by the activable media.[114]

8. Conclusion

In this article I described the methodology that could be useful in the analysis of electronic poetry. Some of the most significant theories concerning electronic writing have been reviewed: for instance Aarseth's concept of *cybertextuality* – which, however, does not refer only to electronic texts – Hayles' definition of *technotext*, Ulmer's concept of *electracy*, Bootz's idea of *transitoire observable*.

These theories and the semiotic approach allowed me to both illustrate the peculiarities of electronic writing and to propose a typology of e-poetry. The technologization of the expression plan has introduced into the electronic text the concept of ergodic time – altering the three traditional aspect of time – and ergodic space – transforming the "writing" space, bringing into the text motions and different semiotic systems, freeing the pagination and making often typography a key element to understand the meaning of the text. The semiotic concept of entax – structured following the structure of syntax – has been proposed in order to analyse some e-poems particularly interested in the typographic potentialities of electronic writing. The introduction of the text motions has created new media figures and tropes that need to be studied.

A typology of e-poetry has been traced according two axis: on one axe it has been considered the expression form of e-poems, focusing also on the question of time, on the other it has been taking into account the reading practice, that's is to say the level of interaction the text allows, which suggests also

an aesthetic of interaction. The aim of this study was to approach e-poetry in a broad way in order to be able to categorize the new aspects e-poetry appears to introduce in poetry.

1Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, Baltimore: John Hopkins University Press, 1997, p. 15

2Encyclopaedia Britannica accessible online at: http://www.britannica.com/bps/dictionary?query=medium (accessed, November 28 2010).

3Walter Ong, *Orality and Literacy. The Technologizing of the Word*, London: Methuen, 1982.

4Marie-Laure Ryan, "Narration in Various Media", in Peter Hühn, John Pier, Wolf Schmid and Jörg Schönert (eds.), *The Living Handbook of Narratology*, Hamburg: Hamburg University Press, 2009, accessible online at: http://hup.sub.uni-hamburg.de/lhn/index.php/Contents (accessed, January 29 2011).

5*Ibidem.*

6Cf. Marshall McLuhan and Quentin Fiore, *The Medium is the Message. An Inventory of Effects*, New York: Random House, 1967.

7Aarseth refers to the term of *cybertext* as a prospective on textuality. In his book, he analyses also printed texts which, however, present *cybernetic* characteristics. I will refer about Aarseth's cybertext theory in section 3.1.1. In this thesis I talk about the "new" textuality offered by electronic poetry because some of its characteristics cannot be reproduced in printed version.

8Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*, p. 24.

9*Ibidem.*

10Per Aage Brandt, "Meaning and the Machine: Towards a Semiotics of Interaction", in Peter B. Andersen, Berit Holmquist, and Jens F. Jensen (eds.), *The Computer as Medium*, Cambridge: Cambridge University Press, 1993, p. 128.

11Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*, p. 25.

12Giovanna Cosenza, *Semiotica dei nuovi media*, Roma-Bari: Laterza, 2004.

13According to Structuralism a text is a portion of reality which has a meaning to someone, consisting of defined limits broken down in discrete units/ hierarchical levels of analysis which follow objective criteria.

14Encyclopedic Dictionary of Semiotics, Thomas A. Sebeok and Marcel Danesi (eds.) USA: DE GRUYTER, 2009.

15Text: most broadly, this term is used to refer to anything which can be "read" for meaning; to some theorists, 'the world' is 'social text'. Although the term appears to privilege written texts (it seems *graphocentric* and *logocentric*).

16Umberto Eco, *Trattato di semiotica generale*, Bompiani, Milano, 1975, En. tr. *A Theory of Semiotics*, Bloomington: Indiana University Press, 1976, p.7.

17*Ibidem.*

18Nicola Dusi and Lucio Spaziante, *Remix-Remake*, Rome: Meltemi, 2006.

19Paul Gilster, *Digital Literacy*, New York: Wiley and Computer Publishing, 1997, p.1.

20Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*, p. 15.

21Louis Hjelmslev, *Omkring sprogteoriens grundlæggelse*, 1943, En. tr. *Prologomena to a Theory of Language*, "International Journal of American Linguistics", Memoir 7, Baltimore: Indiana University Press, 1953.

22Cf. Umberto Eco, *Opera aperta*, Milano: Bompiani, 1962, and Umberto Eco, *Lector in fabula*, Milano: Bompiani, 1979.

23Marshall McLuhan and Quentin Fiore, *The Medium is the Message. An Inventory of Effects, op.cit.*, p. 2.

24Louis Hjelmslev, *Omkring sprogteoriens grundlæggelse*, 1943, En. tr. *Prologomena to a Theory of Language*, *op. cit.*.

25Cf. François Rastier, *Sens et textualité*, coll. Langue, linguistique, communication, Paris: Hachette, 1989. Georges Molinié, *Sémiostylistique*, coll. Formes sémiotiques, Paris: Presses Universitaires de France, 1998.

26Alessandro Zinna, *Le interfacce degli oggetti di scrittura*, Roma: Meltemi, 2004, p. 27.

27*Ibid.*, p. 29.

28*Ibid.*, p. 28.

29He is referring to "discourse" in a more ample meaning compared to the meaning that semiotics gives it, that is to say the intention of giving meaning: they can be footmarks, hunting draws, ornamental motives, or evolved writings able to reproduce the different level of phonetic, syllabic and lexical, and/or narrative acts of natural languages, as alphabetic, syllabic, pictogrammatic and ideogrammatic writings do.

30Alessandro Zinna, *Le interfacce degli oggetti di scrittura*, *op. cit.*, p. 89. "As such, writing exists only as a *thought* of its implementation on a support. This thought implies not only a code, but a gesture and a technique of inscribing. […].Despite the problem of the support is also present in the spoken language, the existence of a *material* of the support is a specific property of the object of writing". The translation is mine. Italicised in the text".

31This problem is so important that both the American Electronic Europe Organization and European Electronic Europe Organization have projects to archive electronic literary creations.

32 I offer in chapter 5 of my thesis a deeper analysis of hypertextuality since even though hypertextual theory is very important it is true that hypertextual writing is just one of the possible electronic writings used by e-poetry – as we will see better as we go through this article and particularly in section 5.

33François Cusset, *French Theory. Foucault, Derrida, Deleuze et Cie et les mutations de la vie intellectuelle aux États-Unis*, Paris: Éditions de la Découverte, 2003.

34Michel Foucault, *L'Archéologie du savoir*, Paris: Gallimard, 1969, p. 34.
I examine the question of authorship in the digital environment in chapter 7 of my thesis.

35Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*, pp. 1-2.

36*Ibid.*, p. 19.

37*Ibid.*, pp. 62–64.

38Katherine N. Hayles, *Electronic Literature: What Is This?*, South Bend : The University of Notre Dame Press, 2008, accessible online at: http://eliterature.org/pad/elp.html (accessed, May 20 2010).

39Katherine N. Hayles, *Writing Machine*, Cambridge and London: the MIT Press, 2002, p. 25.

40*Ibid.*, pp. 32-33.

41*Ibid.*, p. 25.

42Philippe Bootz, "Digital Poetry: From Cybertext to Programmed Forms", in Leonardo Electronic Almanac Vol. 14, No. 5-6, accessible online at: http://www.leoalmanac.org/journal/vol_14/lea_v14_n05-06/pbootz.html (accessed, May 31 2010).

43*Ibidem.*

44*Ibidem.*

45Markku Eskelinen, *Travels in Cybertexuality: The Challenge of Ergodic Literature and Ludology to Literary Theory*, PhD dissertation, Faculty of Humanities, University of Jyväskylä, discussed on August 7 2009, p. 35.

46Noah Wardrip-Fruin, "Understanding Digital Literature", April 2005, accessible online at: www.hyperfiction.org/talks/nwf-diglit-april05.pdf (accessed, May 29 2009).

47Noah Wardrip-Fruin, "The Tale-Spin Effect: Toward an acknowledgement of process in digital literature", Media-space Journal issue 1/2008, accessible online at: http://media-space.org.au/journal/issues/issue1/wardrip/wardrip.htlm (accessed, May 28 2009).

48*Ibidem.*

49 *Tale-Spin* is the first major story generation program and it was made by James Meehan in 1976. It made the leap from assembling stories out of pre-defined bits (like the pages of a Choose Your Own Adventure book) to generating stories via carefully crafted processes that operate at a fine level on story data. In *Tale-Spin*'s case, the processes simulate character reasoning and behaviour, while the data defines a virtual world inhabited by the characters. As a result, while altering one page of a *Choose Your Own Adventure* leaves most of its story material unchanged, altering one behaviour rule or fact about the world can lead to wildly different *Tale-Spin* fictions. *Tale-Spin* can generate fictions with or without audience interaction. When generating with interaction, *Tale-Spin* begins by asking the audience some questions to determine the initial state of the world, especially the characters present in the story. Storytelling begins from these initially-established facts, with the audience consulted as new facts are needed to move the story forward. For example, once the characters are known and the world is established, *Tale-Spin* needs to know the identity of the main character:

50 Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*, p. 104.

51 Markku Eskelinen, *Travels in Cybertexuality: The Challenge of Ergodic Literature and Ludology to Literary Theory*, *op. cit.*, p. 33.

52*Espen J. Aarseth, Cybertext: Perspectives on Ergodic Literature, op. cit.,* p. 105.

53The technologization of the spoken language is in progress: it is an artificial voice produced by a synthesis of impulses arriving to the vocal cords, to use in cases of the articulatory apparatus' lacerations.

54It can be observed that there is a relationship between the writing type and the writing direction: the alphabetic writing are oriented on the horizontal axis, from left to right, the syllabic writing on the horizontal direction but they prefer the other way round from right to left, finally ideograms prefer the vertical axis. Cf. Derrick de Kerckhove, *Brainframes, Technology, Mind and Business*, Utrecht: Bosch & Keuning, 1991.

55Graphology, not surprisingly, studies the manual variation's ways of the fonts and is based on their distribution's and concatenation's mode on the inscribing space.

56Alessandro Zinna, *Le interfacce degli oggetti di scrittura*, *op. cit.*, p. 180.

57Cf. also Espen J. Aarseth, *Cybertext: Perspectives on Ergodic Literature*, *op. cit.*.

58Noah Wardrip-Fruin, "Learning to Read Digital Literature", in Roberto Simanowski, Jörgen Schäffer, and Peter Gendolla (eds.), *Reading Moving Letters,* Bielefeld: Verlag, 2010, pp. 249-259.

59Raine Koskimaa, "Approaches to Digital Literature: Temporal Dynamics and Cyborg Authors", in Roberto Simanowski, Jörgen Schäffer, and Peter Gendolla (eds.), *Reading Moving Letters,* Bielefeld: Verlag, 2010, pp. 129-143.

60 Roman Jakobson, "Linguistics and Poetics" (1958), in *Style in Language*, Thomas A. Sebeok (ed.), Cambridge: MIT Press, 1960, pp. 350-377.

61Friedrich Schleiermacher (1768–1834) philosopher.

62Plato, *Ion*, in Classical Literary Criticism, London: Penguin Classic, 2000, 14- 15.

63Michel Foucault, «Qu'est-ce qu'un auteur ?» (1969)*, Dits et Écrits*, Paris: Gallimard, 1994.

64Roland Barthes, «La mort de l'auteur» (1968), *Le bruissement de la langue*, Paris: Seuil, 1984.

65Umberto Eco, "Vegetal and Mineral Memory: the Future of Books", 2003, accessible online at: http://weekly.ahram.org.eg/2003/665/bo3.htm (accessed, July 2 2006), now accessible at: http://web.archive.org/web/20051124224704/http://weekly.ahram.org.eg/2003/665/bo3.htm (accessed, June 13 2010).

66Frank Popper, «Art action et participation», in *L'artiste et la créativité aujourd'hui,* Paris: Klincksieck, 1980.

67Particularly in chapter 7 I focus on the relationship between the author, the text, and the reader in electronic poetry. For the moment let's briefly see what action the reader can do to the electronic text.

68Peter Stockinger, "Auteur, textualité électronique, et édition multi-support", symposium intervention *L'auteur face aux logiques de l'édition multi-supports: quelle évolution?*, Université Paris 13, 20 juin 2002.

69Alexandra Saemmer, *Matières textuelles sur support informatique*, Saint-Étienne: Publications de l'Université de Saint-Étienne, 2007, p. 33.

70*Ibid.*, p. 34.

71Ronald Barthes, *S/Z*, Paris: Seuil, 1970.

72George P. Landow, *Hypertext 2.0, the Convergence of Contemporary Critical Theory and Technology*, Baltimore and London: The John Hopkins University Press, 1992 and 1997.

73Umberto Eco, "Vegetal and Mineral Memory: the Future of Books", *op. cit.*.

74Michael Joyce, "Siren shapes: Exploratory and constructive hypertexts", *Academic Computing 3*(4), pp. 10-42, p.11.

75George P. Landow, *Hypertext 2.0, the Convergence of Contemporary Critical Theory and Technology*, *op. cit*, p. 76.

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77Alexandra Saemmer, *Matières textuelles sur support informatique*, *op. cit.*, p. 35.

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80Daniela Calisi, *Stillicidio,* accessible online at: http://www.contentodesign.it/testi/tempo1.swf (accessed, February 22 2005).

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82 Chico Marinho, *Palavrador*, 2006, accessible online at: http://www.ciclope.art.br/pt/downloads/palavrador.php (accessed, June 22 2007). I analyse this e-poem in chapter 6 of my thesis.

83Alessandro Zinna, *Le interfacce degli oggetti di scrittura*, *op. cit.,* p. 225.

84*Ibidem.*

85I focus on collaborative poetry in chapter 7 of my thesis.

86Loss Pequeño Glazier *Digital Poetics*: The Making of E-Poetries, Alabama: University of Alabama Press, 2001.

87Mary-Laure Ryan, "Narrative and the Split Condition of Digital Textuality", in *Dichtung-digital*, 1/2005, accessible online at: http://www.brown.edu/Research/dichtung-digital/2005/1/Ryan/ (accessed, May 31 2009).

88Markku Eskelinen *Travels in Cybertexuality: The Challenge of Ergodic Literature and Ludology to Literary Theory*, *op. cit.*, p. 155.

89 Elisa Carlotti, *La rossa parola*, accessible online at: http://utenti.multimania.it/elisa_carlotti/rossaparola.html (accessed, March 11 2003). I analyse this e-poem in chapter 4 of my thesis.

90Alessandro Zinna, *Le interfacce degli oggetti di scrittura*, *op. cit.*, p. 210.

91For a first possible typology of electronic poetry see also : Giovanna di Rosario, "Hyperpoetry on the net: derive e approcci", in Alessandro Zinna (ed.), *Gli oggetti di scrittura II*, Urbino: CISL, 2004, (336-337-338/F), pp. 12-21. Matteo Gilebbi, "La testualità differita", in Alessandro Zinna (ed.), *Gli oggetti di scrittura II*, *op.cit.*, pp.31-40. And Carla Impagliazzo, "La rossa parola", in Alessandro Zinna (ed.), *Gli oggetti di scrittura II*, *op. cit.*, pp. 22-24.

92 This phenomenology corresponds to the division of some chapters within my thesis (chapters 3, 4, 5, and 6).

93Markku Eskelinen *Travels in Cybertexuality: The Challenge of Ergodic Literature and Ludology to Literary Theory*, *op. cit.*, p. 155.

94*Webster's Third New International Dictionary of English Language*, Philip Babcock Gove (ed.), Cologne: Köneman, 1993.

95 Alex Gopher, *The child*, 1999, accessible online at: http://www.youtube.com/watch?v=wgHOGqmRVR8 (accessed, March 20 2002). I analyse this e-poem in chapter 4 of my thesis.

96Cramer's website http://userpage.fu-berlin.de/~cantsin/index.cgi consists of a number of server-side computer programs written in the Perl programming language, each of them reconstructing – and thereby re-inventing – many combinatory poems written by, among others, Optatianus Porphyrius, Jean Meschinot, Julius Caesar Scaliger, Georg Philipp Harsdörffer, Quirinus Kuhlmann and Tristan Tzara. Unfortunately the website doesn't run anymore but some of its pages can be accessed through internet archives.

97Michael Joyce, "Siren shapes: Exploratory and constructive hypertexts", *op. cit.*, p.11.

98 Maria Mencía, *Vocaleyes,* 2000, accessible online at: http://www.m.mencia.freeuk.com/ (accessed, July 10 2008).

99Steven Johnson, *Interface Culture*, New York: Perseus Books Group, 1997, p. 14.

[100]Andrew Murphie and John Potts, *Culture and Technology*, New York: Palgrave MacMillan, 2003, p. 84.

[101]*Ibidem.*

[102]*Ibidem.*

[103]Sean Cubbit, *Digital Aesthetic*, London: Sage Publication, 1998, ix.

[104] *Ibid.*, ix-x.

[105]Cf. Manuel Castells' *Information Age* trilogy: Manuel Castells *The Rise of the Network Society, The Information Age: Economy, Society and Culture Vol. I*, Cambridge-Oxford: Blackwell, 1996. Manuel Castells, *The Power of Identity, The Information Age: Economy, Society and Culture Vol. II*, Cambridge-Oxford: Blackwell, 1997. Manuel Castells, *End of Millennium, The Information Age: Economy, Society and Culture Vol. III*, Cambridge-Oxford: Blackwell, 1998.

[106] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, London: Routledge and Kegan Paul, 1961, p. 5.

[107] In my thesis I identified and described some different aesthetic forms: from the aesthetic of flow proposed by Anaïs Guilet and Bernand Gervais (see chapter 3, section 3), to the aesthetics of the sensual by Andrew Darley (see chapter 4, section 7.2), to the aesthetic of "visual noise" and "sonic noise" th eorized by Maria Engberg (see chapter 6 sections 5 and 8), to the aesthetic of frustration defined by Philippe Bootz (see chapter 5, 6, and 7).

[108] Cf., Rob Waller, "Typography and Discourse", in Rebecca Barr, Michael L. Kamil, Peter B. Mosenthal, P. David Pearson (eds.), *Handbook of Reading Research*, Vol. 2, pp. 341-80. New York: Longman, 1991.

[109]Cf. Gunther Kress and Theo van Leeuwen, *Reading Images. The Grammar of Visual Design*. London: Routledge, 1996.

[110]Roland Barthes, *Le Bruissement de la langue*, Paris: Seuil, 1984.

[111]Charles S. Peirce, (1931-58) *Collected Papers*, 8 Voll., Cambridge/Mass: Harvard University Press, tr. it., Torino, Einaudi 1980-1984.

[112]Cf. Encyclopaedia Britannica accessible on line at: http://www.britannica.com/EBchecked/topic/479409/prosody (accessed, January 31 2010).

[113]Jim Rosenberg, *A Prosody of Space / Non-Linear Time*, in Post-modern Culture, Volume 10, Number 3, May 2000, accessible on line at: http://muse.jhu.edu/journals/pmc/v010/10.3rosenberg.html, (accessed, February 1 2011).

[114] Alessandra Saemmer, "Some stylistic devices on media interface", conference paper presented at The Network as a Space and Medium for Collaborative Interdisciplinary Art Practice, 8-10 November 2008 University of Bergen, accessible on line at: http://elitineurope.net/node/29 (accessed, April 20 2010).

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