



## **The digital text workshop cloud2, new solutions for super calculation environments: ISBN 9788899640637**

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# The digital text workshop cloud2, new solutions for super calculation environments: ISBN 9788899640637

Ritamaria Bucciarelli<sup>1</sup> [0000-0002-1521-9297], Ilaria Veronesi<sup>2</sup> [0000-0002-2765-5918], Francesco Saverio Tortoriello<sup>2</sup> [0000-0002-4600-6411], Francesco Terrone<sup>3</sup> [0009-0009-4444-3851], Andrea Fernanda Rodrigo<sup>4</sup> [0000-0002-5418-252X], Marianna Greco<sup>5</sup> [0000-0003-3161-2467], Colomba La Ragione<sup>6</sup> [0000-0002-2330-6382], Javier Julian Enriquez<sup>7</sup> [0000-0002-9533-1499]

<sup>1</sup> University of Cà Foscari, Venezia, Italy

<sup>2</sup> University of Salerno, Italy

<sup>3</sup> Università degli Studi di Napoli Federico II: Naples, Italy

<sup>4</sup> University of Rosario, Argentina

<sup>5</sup> Ministry of Education, Italy

<sup>6</sup> University Pegaso of Naples, Italy

<sup>7</sup> Polytechnic University of Valencia, Spain

**Abstract.** Quantum physics is the basis of scientific thinking and influences the mind. Wendt [1] in Quantum Mind and Social Science argues that the mind and social life are macroscopic phenomena of quantum mechanics, and that *the quantum consciousness hypothesis* is the cognitive basis of a quantum social science. In these new scientific parameters of knowledge, our visualization matrix is essentially a holographic projection. Research innovation lies in seeking the point of convergence to describe a formal process that, as a multi-code process, goes from a phase of joined sentences to a data implementation phase, Planat of the Institute of Femto -ST Dep. of Micro Nano Sciences and Systems, Besançon, France. The goal is to find points of contact between quantum physics, computational linguistics, and quantum computing. Planat [2] states that the quality that the linguist must possess beyond courage is ... *competence to transcribe mathematical concepts into grammatical structures*. This assumption is at the basis of our study. The tools are 1) identifying new parameters for the production of fixed structures identified in the Planat model mathematical theories; 2) using Charles Baudelaire's narrative text [3] to clarify the importance of the verb in the sentence through the research and experimentation method into a local grammar; 3) utilizing Max Silberstein's NooJ system [4], for the production of sentence analysis and paraphrases, tools for developing formal dictionaries and grammars, and NLP applications such as semantic annotators; 4) developing the implementation of advanced integrated Machine Learning algorithms for the creation of knowledge from obtained data; 5) applying the BiVuTeGMS (© 2020) AW Digital Intelligence model for the production of edited, reformulated and translated sentences using a mixed system. Thus, the entire formal process will make use of 1 Lexical-Grammatical to transfer the numerical quantum language into a lexicon-grammatical code; 2 The NooJ's environment to generate statistical analysis and graphs.

**Keywords:** Scientific thinking, quantum physics, quantum computing, computational linguistics<sup>1</sup>, multi-code process, mathematical concepts, grammatical structures.

## 1 Introduction

Quantum communication with a digital transformation is like in Gloria Bertasi<sup>2</sup> *A drone flying over the city, past and future that are married in a sequence, to summarize in a video, with images, our... digital, classrooms, coworking*. It is a new didactic model that represents a leading project from the rector Tiziana Lippiello: «*Commitment to the new generations. We are a forge of ideas to face global challenges*» It is a communication that digitalizes signs, symbols and icons, morphs, imprinted in formal techniques, but which scientifically transmits an integral semantics. The idea is born from the collaboration research model with scientists from all over the planet, who meet on a social network dedicated to all scientific disciplines, who work on areas of expertise and who use new tools for comparison, in real time. It is an open dialogue in which the experts by field of experience provide materials and guidance. In other words, collaboration in real time leads the participants to understand the study indicators, the methodology, and a model of *Project quantum computing: quantum models, technologies and validations*. These are products available at ResearchGate<sup>3</sup>, which offers an open dialogue in collaborative work. The present work focuses, on the DPH text<sup>4</sup> in the field of quantum and literary communication which represents the synthesis of the *digital literary communication project included in Graphic coverings to study non local structures of communication descriptions analysis validations magazén: lieux - méthodologies - processus et validations*.<sup>5</sup> The objective is to create semantic equivalences between quantum mathematics and computational linguistics in the French narrative typology in which the guiding themes are: Entanglement Numbers; experts Corpus Linguistics Grammar Computational Linguistics Morphology Natural Language Processing Lexicography Syntax NooJ. We have conducted and authored searches in these related topics ranging from number theory to the theory of group graphs \_ sentence. The present work instead represents the intuition of the passage from literary textuality in the digital one, or from a narrative text in code. <sup>6</sup>The model is Quantum Gravity Research, Los Angeles, and in Raymond Aschheim, Marcelo M. Amaral, Fang and Klee Irwin, who in Graph Coverings for Investigating *Non-Local*

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<sup>1</sup> The Digital Text Workshop Cloud, New Solutions for Super Calculation Environments | SpringerLink

<sup>2</sup> [https://corrieredelveneto.corriere.it/venezia-mestre/cronaca/21\\_dicembre\\_23/venezia-futuro-ca-foscari-digitale-aule-coworking-studentato-lido-27357a14-6](https://corrieredelveneto.corriere.it/venezia-mestre/cronaca/21_dicembre_23/venezia-futuro-ca-foscari-digitale-aule-coworking-studentato-lido-27357a14-6)

<sup>3</sup> [https://www.researchgate.net/publication/355491134\\_Quantum\\_computation\\_and\\_measurements\\_from\\_a\\_space-time\\_in\\_fixed\\_languages](https://www.researchgate.net/publication/355491134_Quantum_computation_and_measurements_from_a_space-time_in_fixed_languages)

<sup>4</sup> <https://www.researchgate.net/messages/1770891171>

<sup>5</sup> [https://www.researchgate.net/publication/355116190\\_Graphic\\_coverings\\_to\\_study\\_non\\_local\\_structures\\_of\\_communication\\_descriptions\\_analysis\\_validations\\_magazen\\_lieux\\_-\\_metologies\\_-\\_processus\\_et\\_validations](https://www.researchgate.net/publication/355116190_Graphic_coverings_to_study_non_local_structures_of_communication_descriptions_analysis_validations_magazen_lieux_-_metologies_-_processus_et_validations)

<sup>6</sup>All books on ResearchGate

*Structures in Proteins, Music and Poems* [2], Charles Baudelaire, in *Les Petits Poèmes en prose* [3].

In this way, the mathematical model proposed by French experts is analyzed, in addition to the points of contact and structural equivalences between mathematical theory and computational linguistics, but above all, a new exploration is identified in the research area that generates a new mathematical, linguistic, computer science multi code paradigm, etc. thus, providing us with points of reflection to reach the equivalences between the structures or between the different typologies. The research question is: will we be able to find other points of convergence between quantum theory, mathematics, and linguistics?

Likewise, the research hypothesis is structured with a new methodology with the participation of experts, who meet on a social network and work within areas of expertise, using new tools of comparison. The present work focuses on the formal process of literary production, on its encounter with digital intelligence. The research questions are: -Will the mathematical model succeed in describing formal processes? Will we succeed with scientific theories to elucidate the process of synthesis of languages and still find the points of convergence between quantum mathematics and computational linguistics? With Nagel and Newman [5] the attempts to mechanize the mental processes of reasoning begin, and it should not be forgotten that already Euclid codified geometry, but many centuries will pass before one could have axiomatic reasoning. Mathematicians and logicians first sensed that in formal systems, meaning and form of the knowable and nature could be discerned. Indeed, in the dialogue Caroll [6] poses a profound philosophical problem in Douglas R. Hofstadter Godel, Escher, Bach "do words and thoughts follow formal rules or not? " The answer is to be found in Wendt [1]: we are continually "trapped" through language and communication. As a result, inferable that today's communication is formal, that is, made of systems, axioms, methods of validation and theorems and included in a formal grammar.

## **A mathematical model: group relationship and analysis**

In the first phase, we look for the assumptions that lead us to the primary purpose, which is to verify the applicability of scientific theories, as a correlation tool to literary communication. We analyze and investigate the process that transformed the literary text into a scientific model performed by M. Planat. The conjugation classes of the subgroups in a finitely generated group start from the concept of relationship. Let  $rel(x_1, x_2, \dots, x_r)$  be the relation defining the finitely presented group  $fp = \langle x_1, x_2, \dots, x_r | rel(x_1, x_2, \dots, x_r) \rangle$  on  $r$  letters (or generators). We focus our attention on the classes of subgroups of  $fp$  with respect to the nature of the relation  $rel$ .

**Table 1.** The number  $\text{Isoc}(X, d)$  for small values of first Betti number  $r$  (alias the number of generators of the free group  $\text{Fr}$ ) and index  $d$ . Thus, the columns correspond to the number of conjugacy classes of subgroups of index  $d$  in the free group of rank  $r$ .

$r$	$d=1$	$d=2$	$d=3$	$d=4$	$d=5$	$d=6$	$d=7$
1	1	1	1	1	1	1	1
2	1	3	7	26	97	424	4163
3	1	7	41	604	13,753	504,243	24,824,785
4	1	15	235	14,120	1,712,845	371,515,454	127,635,996,839
5	1	31	1361	334,576	207,009,649	268,530,771,271	644,969,015,852,641

The point of convergence between linguistics and mathematics lies in a side-by-side methodology, namely, the transfer of the number group to the phrase group is the French research model ... *Our mathematical theory of the secondary structures in proteins, music and poems relies on the concept of a finitely generated group and the corresponding graph coverings... and LGLI lexical-grammar methodologies.* The intuition arises that the process of the mathematical model for the reduction of the group just described is filtered through... *the cardinality structure  $\eta d$  (fp) of the conjugation classes of the subgroups... <sup>7</sup>to transform a group into a partition of certain cardinality structures and then... and so the formal reduction process is the same as the linguistic model.*

In the first stage, we identify in the theories of Planat [2] a formal paradigm that is developed in mathematical theories. By then, the assumptions are sought that lead us to the primary purpose, which is to test the applicability of scientific theories, as a correlation tool to literary communication. They focus the studies on the mathematical model on the justifications of formal processes as K. Godel in Douglas R; Hofstadter Godel, Escher [6] *of uses mathematical reasoning to explore mathematical reasoning itself* and this is what happened in the present work in which mathematical theories, such as group theories and their properties, are investigated in search of answers included in mathematical reasoning itself, to motivate, validate and justify: 1- the comparison of parameters in different textual contexts; 2- structuring or validating a guiding formal system, which by serving mathematical reasoning (system of validation of axioms, a method etc.) in Douglas R; Hofstadter Godel pg. 50 [6], theories, theorems to support that activate a synthetic, homologated, fixed formal code embedded in a new formal paradigm; 3- analysis of the Quantum Gravity Research model, in Planat [2], Charles Baudelaire, in *Les Petits Poèmes en prose: Le Spleen de Paris*, 1869, poème XVI for the narrative text seq n ° 2 [3]:

[...] *Le gamin du céleste Empire hésita d'abord; puis, se ravissant, il répondit: «Je vais vous le dire. » Peu d'instant après, il reparut, tenant dans ses bras un fort gros chat, et le regardant, comme on dit, dans le blanc des yeux, il affirma sans hésiter: «Il n'est pas encore tout à fait midi. » Ce qui était vrai. [...].<sup>8</sup>*

<sup>7</sup> IBIDEN page 3

<sup>8</sup> Gouvard, J. M. (2017). *Le Spleen de Paris* de Charles Baudelaire: des «petits genres journalistiques» aux «petits poèmes en prose». *Mémoires du livre/Studies in Book Culture*, 8(2).

In wanting to proceed to an analysis, we focus on the text in question and identify the points of convergence, according to Planat [2], our mathematical theory of secondary structures in proteins, music and poems is based on the concept of finitely generated groups and the corresponding coverings of graphs, as explained. A theory in which the authors declare their belonging not only, they explain their similarity points, transformations and code symbols embedded in their own grammar, making use of scientific theories in these focal points: page 1 [2] *Introduction.... In this paper, we show for the first time a remarkable analogy between the structure of the bonds between amino acids of a protein (the secondary structure of proteins) and the nonlocal structures observed in tonal music and poems. We explain the origin of these analogies with finitely generated groups and graph covering theory.*

*Description:* Transformation into finite group: Analysis and partitions into groups (group theory); Homomorphism, Generators, etc.

Chosen codes:

- Protein language = alphabet
- Musical language = letters (tonal analysis -) recursion
- Poetic -narrative language = letters (final analysis) recursion

Categories of 3 symbols: H = (Names and Adj); E = (V); C = (diet and ended)

Categories of 4 symbols: H = (Names and Adds); E = (V); C = (diet and ended); A = Prep

Categories of 5 symbols: H = (Names and Adds); E = (V); C = (diet and ended); A = Prep; Lawyer

**Table 2.** Reformulation of the textual tract of C. Baudelaire sequence in Planat et al. pag 9

Le Gamin du Céleste Empire... Ce Qui était Vrai.	Card. Seq. of cc of Subgroups	r
3 letters: $rel=C^2 H^6 C^2 H^7 H^6 E^6 C^7 CC^4 CC^2 E^8 C \dots$	[1,3,7,34,131]	2
4 letters: $rel=C^2 H^6 A^2 H^7 H^6 E^6 C^7 CC^4 CC^2 E^8 C \dots$	[1,7,41,636,14364]	3
5 letters: $rel=C^2 H^6 A^2 H^7 H^6 E^6 B^7 CB^4 CC^2 E^8 C \dots$	[1,15,235,14376,...]	4

Research conducted so far, thanks to the scientific model and Planat [2] in Quantum Gravity Research, Los Angeles, and in Raymond Aschheim, and Marcelo M. Amaral, Fang and Klee Irwin in Graph Coverings for Investigating "Non-Local Structures in Proteins, Music and Poems" to the support guided in the studies. It has enabled us to describe in the quantum mathematical model a new formal code in a descriptive grammar. The dissertation continues with the transfer into a formal grammar, with a different code, but with the same mathematical axioms.

## 2 Comparing models: language environments and Lexicon-Grammar as an elementary calculation LGLI

Progressing in the exposed sense, let us compare the mathematical pattern in the methodologies of M. Planat [2] with the Lexicon-Grammar methodologies for the transformation of mathematical codes into linguistics.

In this way, if we would like to proceed to one taxonomic classification from the possible sentences from the narrative sequence of the French narrative literary text, it would be convenient to clarify the importance of the verb in the sentence through the research and experimentation method of LGLI [7] and to insert them into a local grammar. Thus, we intend to bring the mathematical paradigm back into linguistic structures to produce a formal synthetic code in a formal grammar Lexicon-Grammar L.G.L.I.<sup>9</sup> [7]:

*During a decade of experimental work carried out in the Department of Communication Sciences of the University of Salerno [8] in collaboration with other research centers and with the "Laboratoire d'Automatique et Linguistique (CNRS - Paris)", new methods for linguistic investigation have been developed. Research has been carried out based essentially on the construction of syntactic lexicons that, taking advantage of the opportunities offered by computerized data processing, point to a description, as exhaustive and formal as possible, of a specific language. The research is part of the project "Lexicon-Grammar of the Italian language (LGLI)". The theoretical reference model is represented by the "Operator-argument Grammar" [9]. A rigorously analytical approach has been derived in which, despite the centrality of the syntax and the scientific nature of the rules of transformation, the grammar of a language should no longer be interpreted as an abstract model but be investigated based on concrete statements L.G.L.I [7].*

By associating the first-class code sentence (43) with the class code sentence (41), a multiplicity of sentences with the same characteristics is realized:

$N_1 \approx N_{hum}$	$N_1 \approx V^6 \Omega$
$N_1 \approx N_{ar}$	$N_1 \approx di V^6 \Omega$
$N_1 \approx il fatto Ch F$	$N_1 \approx N_1 \Omega$
$N_1 \approx V^4 \Omega$	$N_1 \approx se Fo se F ciò$
$N_1 di V_1 \Omega$	$Ppv = lo$
$N_1 V$	$N_1 \approx N_{hum}$
$N_1 VN_1$ contro $N_1$	$N_1 \approx N_{hum}$
$N_1 V$ (presso con) $N_{hum}$	$N_1 \approx il fatto ChF$
	$N_1 di N_{hum}$
$N_1 \approx Che F$	$N_1 da N_1$
$N_1 \approx V^6 \Omega$	$N_1 dal fatto ChF$
$N_1 \approx Aux V^6 \Omega$	$ChF \approx N_{hum}$
$N_1 di V^6 \Omega$	Passivo
$N_1 \approx di Aux V^6 \Omega$	
$Neg/interrog = Foong$	$N_1 \approx N_1 Agg^1$
$Imp = Foong$	$N_1 \approx Agg^1 ChF$
$N_1 \approx Che Foong$	$N_1 V$ (essere cong)
$N_1 \approx Foong$	$N_1 hum per Aux V^6 \Omega$

**Fig. 1.** Description of an operator by classes of operators (lexical grammar): converging models. Classifying table: Elia 1984 pag. 193.

<sup>9</sup> NooJ, a natural language processing software developed by Max Silberztein (2007, 2008). NooJ and the evolution of Intex (Silberztein 1993, 1999) on which Silberztein worked in the decade 1992-2002 under the guidance of Maurice Gross at LADL. NooJ allows the construction of dictionaries and electronic grammars and their application to large corpora ([www.nooj4nlp.net](http://www.nooj4nlp.net)). NooJ is a linguistic engine that includes some computational devices used both for the formal description of linguistic phenomena and for the parsing of written texts: automata and finite state transducers, recursive networks, regular expressions and context-free grammars.

This transformation can occur injectively: if, taken two distinct elements of the first set, two distinct elements of the second set correspond (Monomorphism). It can occur surjectively: if each element of the second set corresponds to at least one element of the first set (Epimorphism).

It can occur biunivocally if each element of the first set corresponds to one and only one element of the second set (Isomorphism) F Description of an operator by classes of operators (lexical grammar): converging models.

A first reduction in formal code is obtained in the categorization of operators [10] according to a lexical grammatical classification of verbs and checks the possibility of aggregation with nominal forms. Research on sentence structures involves a lexical grammatical classification of verbs and checks the real possibility of aggregation with nominal forms. According to the theories of Harris and Chomsky, through the study of the combinatorial possibilities of sentences, sentences which have ample possibility of commutation of lexical entries within the position N (radioactivity of the class of IVs) are considered "free". A second characteristic of simple sentences is characterized by the co-occurrence of a class of operator verbs and support verbs.

It is appropriate to parse sentences according to the theories of Harris and Chomsky [11] through the study of the combinatorial possibilities of sentences, which are considered "free" sentences and that have wide possibility of switching lexical entries within the N position (productivity of the class of N). A second feature of simple sentences is characterized by the co-occurrence of a class of operator and support verbs. The third one, by sentences that are referred to as phrases: As a result, as stated earlier, if we would like to proceed to one taxonomic classification from the possible sentences from the narrative sequence of the French narrative literary text, it would be convenient to clarify the importance of the verb in the sentence through the research and experimentation method and to insert them into a local grammar: <sup>10</sup>

### Seq. 2 XVI

Les Chinois voient l'heure dans l'œil des chats.

[...] *Le gamin du céleste Empire hésita d'abord; puis, se ravisant, il répondit: « Je vais vous le dire. » Peu d'instant après, il reparut, tenant dans ses bras un fort gros chat, et le regardant, comme on dit, dans le blanc des yeux, il affirma sans hésiter: « Il n'est pas encore tout à fait midi. » Ce qui était vrai. [...]*» <sup>11</sup>

Analysis of the linguistic mechanisms of the sequence Fs

I = Verbal operators: *Je vais vous le dire; il reparut; le regardant; il affirma; hésiter; (Ce qui) était vrai. Mechanisms of Pronominalization*

<sup>10</sup> Elia, A., Martinelli, M., D'Agostino, E., 1985, "Three components of Italian syntax: simple sentences, supporting verb sentences and idiomatic sentences ", in Proceedings of SLI 24, *Syntax and morphology of the language Italian use. Descriptive theories and applications*, Rome, Bulzoni, pp. 311-325.

<sup>11</sup> The boy of the Celestial Empire at first hesitated; then, changing his mind, he replied: "I'll tell you." A few moments later he reappeared, holding a very large cat in his arms, and looking him, as they say, straight in the eye, said without hesitation: "It is not yet noon." What was true.



- 2= Substitute preverbal pronouns: *le dire; il reparut; le regardant; il affirma; hésiter; (Ce qui) était vrai. Pronominal positionality*
- 3= Polyrematic: *celeste Empire; M. Word= (le regardant) dans le blanc des yeux: Denotative phrase DPH= comme on dit.*

Parsing and reduction in Fs = Analysis on a sequence

Fixed sentences: *le regardant, ..., dans le blanc des yeux, Ppv V*

Comparative analysis: Mathematical Model – L.G.L.I

3 = *Le gamin hésita* = Det N0 V= HEC

4 = N0 Det V C = A H E C

*Le gamin. Empire hésita* =

5= N0 V C c = A E H C B

*regardant, comme on dit, dans le blanc des yeux, =N0 V Ppo C loc.*

Analysis of the mechanisms of the sentence

- Pronominal manipulation = analysis of the average such as

*Je vais vous le dire; il reparut; le regardant; il affirma; hésiter; (Ce qui) était vrai.*

= Ppv V<sub>supp</sub> V; Ppv V Ppv V.....

- Calculation of the Fibonacci series, homophone iteration <sup>12</sup>

*Le<sub>1</sub> gamin du cé<sub>1</sub>le<sub>2</sub>ste<sub>3</sub> E<sub>5</sub>mpire<sub>8</sub> hé<sub>13</sub>sita d'abord; puis, se ravisant, il répondit: “Je vais vous le dire*

1            1            2            3            5            8            13...

- Phrase M. Word or idiomatic = Les Chinois voient l’heure dans l’œil des chats.

.... *le regardant, comme on dit, dans le blanc des yeux ... = N 0 V as C I*

They are found in the seq. 2 A multifrequency of Polyrematic as per the title.

### 3 The lexical-grammatical and automatic text analysis<sup>13</sup>

*NooJ is geared towards developing grammars processing large amounts of texts and therefore contains a full-fledged corpus processing module, indexing, annotation and*

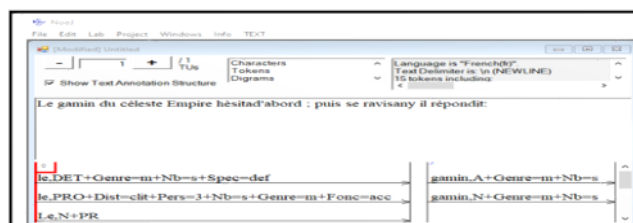
<sup>12</sup> The recursive technique was carried out on the elementary calculation of syllables and on the phonic repetition of a phonic analysis (Silvestri 2014, pag.214)

<sup>13</sup> For the realization analysis textual automatic was \_ used the NOOJ software package, mainly based on the use of electronic dictionaries, local grammars and state automata and transducers \_ finished (hereinafter FST). In the course from the software applications, they are States used the dictionaries electronic developed by the Science Department from the Communication of the University of Salerno, or five dictionaries of the DELA system

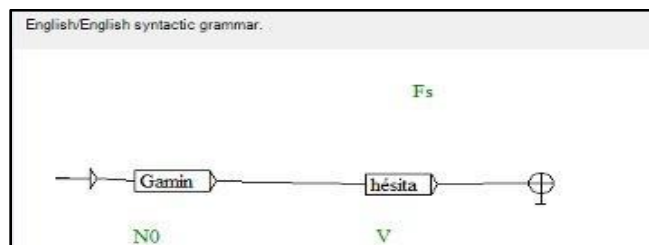
querying of corpora is a basic functionality. Corpora's size is typically ...Text can be imported in a wide variety of formats and a lexical analysis is immediately applied based on a robust dictionary module that has a built-in morphological analyzer. The result of the lexical analysis becomes the initial tier in a set of stand-off annotation levels containing at first POS and morphological codes as well as the result of any morphological grammars that carried out typical pre-processing normalizations of the text.<sup>14</sup>

It is a supercomputing environment in which computations are produced by transformational analysis of feature mechanisms and graphs are produced in the NooJ environment:

One of the most attractive features of the system that immediately appeals to users is the ease with which sophisticated grammars (of various levels of computing power) can be built in graph form and applied to corpora as a query [12] (see, Fig. 2, for an example). This feature alone makes NooJ ideal for teaching and a rapid application development tool alike. The graphs have alternative textual notation in case that mode of definition proves more applicable.



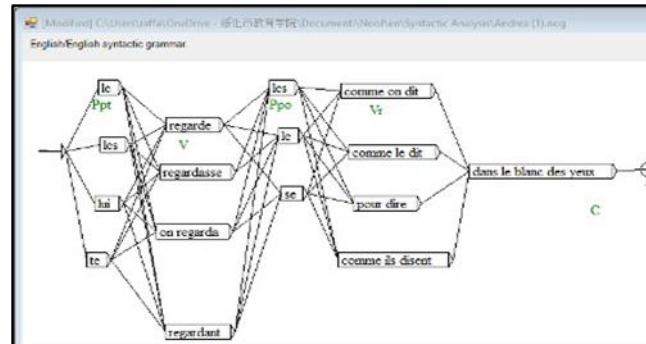
**Fig. 2.** Sophisticated grammars of various levels of computing power built in graph form and applied to corpora as a query.



**Fig. 3.** Analysis and graphs converging in a single local grammar.

(dictionaries of simple and compound words) to which it has been flanked a dictionary electronic specialist in the sector from the communication.

<sup>14</sup> Max Silberztein, Tamás Váradi, Marko Tadić, Open source multi -platform NooJ for NLP.



**Fig. 4.** ... le regardant, comme on dit, dans le blanc des yeux ... = N 0 V as C 1.

In accordance with the above, one characteristic of NooJ [13] is that its corpus processing engine uses large-coverage linguistic lexical and syntactic resources, which allows NooJ users to perform sophisticated queries that include any of the available morphological, lexical or syntactic properties. In this way, both Planat and Silberstein methods could serve as a basis for carrying out operations in Linguistic, Physics, and Mathematics settings that would allow users to build broader mathematical, lexical, and semantic structures in these fields of study.

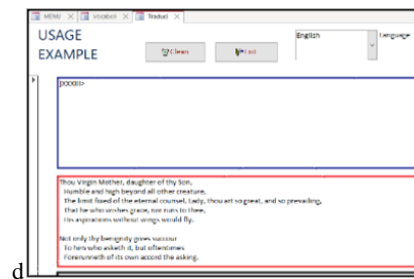
#### 4 Digital intelligence W. Tool in NooJ environment

The DIGITAL INTELLIGENCE W.T language environment (©2020) BiVuTeGMS involves the presence of an "excellent" human mind to control and guide the whole process:

1. taxonomies of phrases, parts of phrases, syntagms or parts of syntagms, reconverted into acronyms that have undergone validations such as: analysis and detection of linguistic mechanisms (manipulations of substitutions, permutations, syntagmatic and phonological calculation according to Silvestri's theories), productions computation of averages, of selected sentences.
2. In linguistic environment Nooj software M Silberstein, production of parts phrases or syntagms reconverted into graphs following the techniques and tools of graph theory (parallel production of the presence of the same phenomenon with the two justifications for linguistic-mathematical domains.
1. This is the definitive reduction in acronyms, that is, the resultant of fixed sentences. The digital archive is supported by a sheet of editing, reformulation, reversion of sentences or textual parts. If we would like to describe the formal process, we would say that the data, i.e. sentences, follow the following process of archiving data collection (sentences) and calculation of linguistic mechanisms and averaging - reductions into categories (L.G.L.I) production of formal codes in Noo environment and transformational and distributional analysis of chosen traits in high computing and scientific validation environments, phrase reductions into acronyms. The central part of the software consists of a digital sheet in which the

operator edits, translates, and reconverts using acronyms (i.e. fixed phrases) and free phrases that the digital operator produces as needed. It is called redactor text precisely because it is like

2. a paper sheet, it can construct different text types and dependent on human skills, even better on human excellences and therefore their functions are drafting of a text composed of free sentences and paraphrases; translation and reformulation from one language to another L1 L2 L3 including iconic languages.



**Fig. 5.** Example of the digital intelligence W. Tool in NooJ environment.

## 5 Conclusion and research results

Although we have described the Planat's mathematical model with a single text at our disposal and based on their production, we can say that we have compared mathematical theories to the computational linguistic theories of Lexicon-Grammar in the stages and process of similarity between languages and system of reduction in fixed synthetic code and homologated by domains. From the concentration on the mathematical concept contents of group, relation and series, it emerged that they are the unequivocal reductions to paraphrase the number group into phrase group, then into validation code from mathematical to linguistic symbols.

In describing the clear stages for the formal description of languages, it is understood that, of course, important stages are missing, such as quantum computing and universal digital writing code.

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## References

1. Wendt, Alexander. *Quantum mind and social science*. Cambridge University Press, 2015.
2. Planat, M., Aschheim, R., Amaral, M. M., Fang, F., & Irwin, K. Graph Coverings for Investigating Non-Local Structures in Proteins, Music and Poems. *Sci*, 3(4), 39. (2021).
3. Baudelaire, Charles. *Le Spleen de Paris (Petits poèmes en prose): A posthumous collection of poems by Charles Baudelaire*. BoD-Books on Demand, 2019.

4. Silberztein, M. (Joe loves lea: transformational analysis of direct transitive sentences. In *International Conference on Automatic Processing of Natural-Language Electronic Texts with NooJ* (pp. 55-65). Springer, Cham. 2015, June).
5. Nagel, E. & Newman, J.R. Gödel's proof (Rev. ed.). New York: New York University Press. (2001).
6. Hofstadter, D. R., Trautteur, G., & Veit, B. *Gödel, Escher, Bach: An Eternal Brilliant Garland: a metaphorical fugue on minds and machines in the spirit of Lewis Carroll*. Adelphi. (1984).
7. Elia, A., Martinelli, M., D'Agostino, E. "Three components of Italian syntax: simple sentences, support verb sentences and idiomatic sentences", in *Atti della SLI 24, Syntax and morphology of the Italian language of use. Teorie e applicazioni descrittive*, Roma, Bulzoni, pp. 311-325. (1985).
8. Bucciarelli, R., Capone, R., Tortoriello, F. S., Greco, M., Savarese, G., & Enriquez, J. Learning Analytics-Scientific Description and Heuristic Validation of Languages NLG. *Journal of e-Learning and Knowledge Society*, 15(3), 251-261. (2019).
9. Harris, Zellig S. "The Elementary Transformations". TDAP 54. Philadelphia: Univ. of Pennsylvania. (Excerpted in Harris 1970:482–532 & abbreviated in Harris 1981.211–235.) (1964).
10. Elia, A., Landi, A., & Bucciarelli, R. From grammar to poetic text. *Loffredo editore, Naples*. (2000).
11. Elia, A., Monteleone, M., & Marano, F. From the concept of transformation in Harris and Chomsky to the Lexique-Grammaire of Maurice Gross. *History of linguistics*, 76-82. (2011).
12. Silberztein, M. "Dictionnaires électroniques et analyse automatique de textes: le système INTEX." (1993).
13. Silberztein, M. "NooJ: a linguistic annotation system for corpus processing." *Proceedings of HLT/EMNLP 2005 Interactive Demonstrations*. 2005.

## Online resources

3. <https://www.researchgate.net/messages/61518552>
4. <https://www.researchgate.net/messages/1770891171>
5. <https://www.researchgate.net/messages/70162360>
6. <https://www.researchgate.net/messages/1770891171>
7. <https://www.researchgate.net/messages/57516656>
8. <https://www.researchgate.net/messages/701623600>  
Type Race: M. Renda, R. Bucciarelli team del POLO Università di Salerno, Corpus di completamento parole lemmi e frasi e parafrasi di frasi.
9. Digital Intelligence Acro-Word; R. Bucciarelli; P. Villari; M. F. Terrone; R. Marcone; F. Santoro: DB ambienti di sviluppo linguistico e riformulatore testo con tecniche cloud delle lingue naturali verbali e non verbali
10. Word-Tool, R. Bucciarelli; P. Villari; F. M. Terrone; M. Greco; R. Marcone; F. Santoro: Redactor text di formulazione testo e di riconversione del linguaggio LIS in codice della lingua naturale (L<sub>1</sub> in L<sub>2</sub>), traduttore automatico tedesco-italiano e inglese - italiano, trasmissione in tempo reale.