

**2023-2024 RESEARCH PROJECT  
MODELS, PROCESSES, METHODS, TECHNOLOGIES  
NLP**

**RESEARCH TOPICS: NATURAL LANGUAGES, NLP-NATURAL LANGUAGE PROCESSING, DIGITAL INTELLIGENCE**

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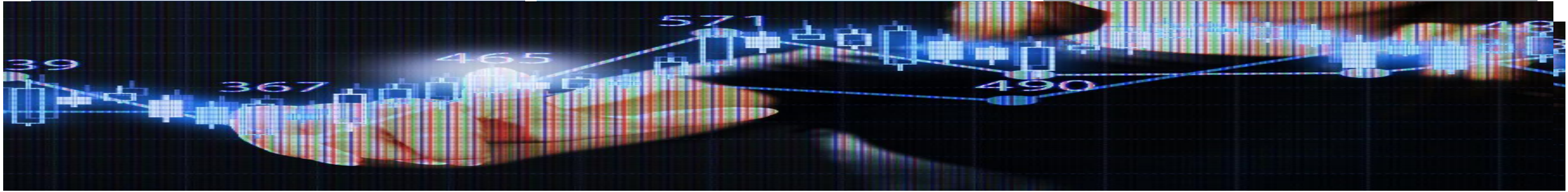
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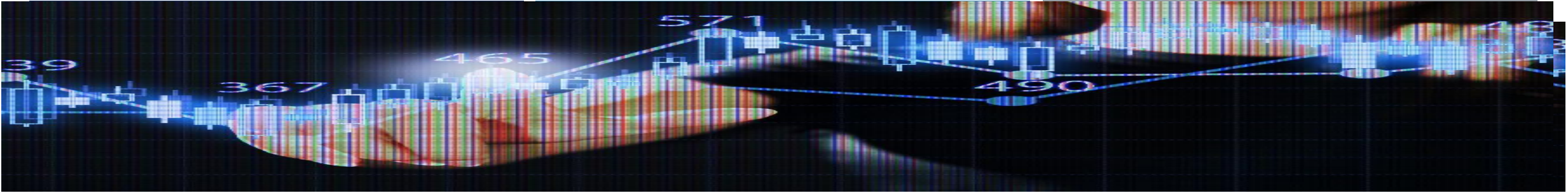
## **Abstract**

The aim of this Project is to explore mathematical models that address the intersections and structural equivalence between mathematical theory and computational linguistics. In this context, a new formal code can be described using a descriptive grammar through the scientific Planat's model. Likewise, we draw on NooJ's model, which is designed for the development of large text processing grammars. The corpora may be of any size, and the text may be imported in a wide variety of formats. A lexical analysis is immediately applied based on a robust dictionary module that includes an integrated morphological analyzer. This study is then concerned with the formal process of literary production and its encounter with digital intelligence. It also identifies a new possibility for research that creates a new multi-code mathematical, linguistic, and computational paradigm. It can therefore be assumed that contemporary communication is formal in nature, comprising systems, axioms, validation methods and theorems, and embedded in a formal grammar.

**Keywords:** mathematical theory, computational linguistics, Planat's model, NooJ's model, digital intelligence.

**Acknowledgements:** we recognize the contributions of the Cà Foscari Group students in the realm of collaboration and scientific support.





**The research topic is as follows:** The evolution of communication in the digital age, from the era of the spoken word to the present era of contractualism in the third millennium.

**The focus of this study is:** to examine the evolution of communication in the digital age, from the era of human speech to the current era of artificial intelligence. This research topic concerns the communicative process of literary communication in the digital domain. It examines the evolution of human intelligence and its interaction with artificial intelligence.

**The observation area is as follows:** The study of literary communication in the digital domain encompasses techniques, technologies, and models.

**The research pathway is divided into three segments and topics:**

*Humanae litterae* digital text exploration

Automatic digital text.

Implementation and Digital Intelligence.

**The disciplines involved in this research pathway are as follows:** digital human literature, computational philology, computational linguistics, quantum computing, and Artificial intelligence (AI).

### **Scientific Collaboration**

**Max Silberztein** The University of Franche-Comté, located in Besançon, France, offers a degree program in this field. ELLIADD.

Disciplines: Syntax, Semantics, Data Mining, Informatics in the social sciences, arts, and humanities. Skills and Expertise: Corpus linguistics, Grammar, Computational linguistics, Morphology.



**M. Planat.** FEMTO-ST: Michel Planat FEMTO-ST (Besançon) and Quantum Gravity Research (Los Angeles, USA) Besançon, France Expert in Quantum Computing Institute of Femto-ST Department of Micro Nano Science and Systems (MN2S) Besançon, France.

**Francesco Terrone.** Professor of Education at the Athens Institute for Education and Research, Italy.

**Colomba Ia Ragione.** Managing Director at Pegaso Telematic University, Italy.

**Andrea Fernanda Rodrigo.** The Rosario Department of the National University, Argentina. The Center for the Study of Educational Technologies and Computer Tools for Language Processing is a research center dedicated to the advancement of educational technologies and computer tools for language processing.

**Javier Julian Enriquez.** Master's Degree in Languages and Technologies, Polytechnic of Valencia.

**Pasquale Villari.** He is a professional master for Poste Italian's mobile network within DTO and DPO, as well as an IT and digital transformation manager at Sidelmed.

In summary, the research studies and analyses conducted between 2019 and 2023 focused on the areas of natural language and natural language processing (NLP), as well as digital intelligence. The model/framework is designed to formalize various complex phenomena in research fields, including humanities, theoretical linguistics, computational linguistics, computerized numerical philology with automatic computation, and software engineering. The pathway is comprised of the following segments: 1. *Humanae litterae* electronic literature; 2. Automatic digital text; 3. Implementation and digital intelligence. The research is limited to the following segments: 1-2- Automatic Digital Text; 3- Implementation and Digital Intelligence.

### **Segment: 1 exploration of the digital text *Humanae litterae***

The objective is to provide a foundation for the field of computational text analysis. We welcome contributions that include methods and tools for computational text analysis, as well as historical reflections on the evolution of research up to the most recent theoretical frameworks. This encompasses methodologies for the analysis of literary texts and corpora, encompassing computational models for literary criticism on the one hand, and linguistics and computational linguistics research, including natural language processing techniques, on the other. Furthermore, this section welcomes reflections on methods and projects in fields not strictly within the humanities.



### **REQUIRED CERTIFIED SKILLS AND MODALITIES:**

An innovative research methodology was made possible through the collaboration of scholars in the ResearchGate scientific community, a network in which scientists contribute and support each other in the research process. The reliability of research results can be determined by examining the research interest score of research articles on ResearchGate. For purposes of comparison by publication date, comparison by discipline, and so forth.

### **RESEARCH PHASES:**

#### **A- PREVIOUS EXPERIENCE**

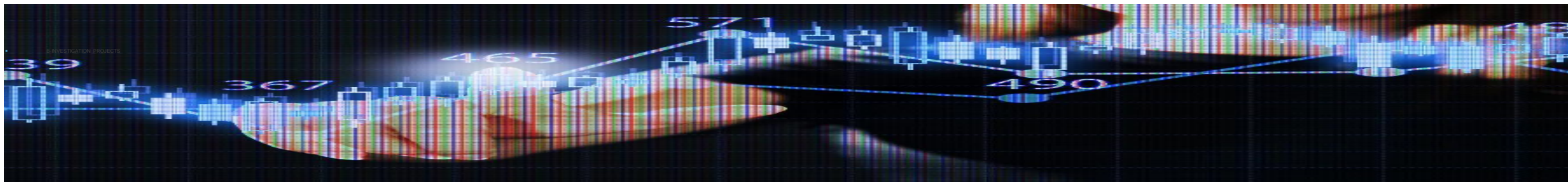
A review of the relevant literature and a synthesis of the insights gleaned from it. The textual types under consideration are Chinese-Arabic language study and ASL-LIS.

Project: The objective of this study is to develop language resources for the automatic generation of natural sign language. In addition, the project will investigate language structures, including language mechanisms (transformational and distributive). Furthermore, the project will examine text types and develop a predictive calculation for online language production.

Project: Technologies and New Communication Models for Teaching ESP Digital Intelligence. Substantive Differences and Language Mechanisms and New ESP Communication Models.

The Digital Intelligence Project employs technology models and processes to develop next-generation software for computational and supercomputational transformations, corpus production, local grammars, and databases. The project is led by M. Silberztein and includes contributions from Word tool for digital intelligence, p. Villari; M., F.; R. Bucciarelli *et al.* The project's objective is to edit, translate, and reformulate texts in real time.





## EXPERTS BY SECTOR:

A synopsis of the findings and insights gleaned from various studies. The disciplines of mathematics, quantum physics, philosophy, *Humanae litterae*, philology, psychology, and others.

Project: Digital Literary Communication: Techniques and Models. DPH: Validation and Implementation of Quantum Physics: Analysis: Phono-tonal Analysis.

The objective of this study is to investigate the potential of quantum computation for the detection of the emotional triplet described in the Fano Plane.

1.1 The Musicological Model as a Scientific Study of Music.

1.2 The Number Sequence of the Fibonacci Series and the Golden Section Compared with Musical Forms.

Focus: Connections between Music and Mathematics, Repeated Number (Recursiveness), Fibonacci Sequence, the reflection sequence is defined as a group of numbers.

The following hypothesis is put forth for consideration: Relational Musical Poetry The concept of recursiveness can be understood as an emotional calculus. Sequence reflection is defined as a group of numbers.

1.3 Project This dissertation examines the implications of digital communication design in a quantum society. It considers the potential of smart technologies and digital intelligence to shape the future of communication.

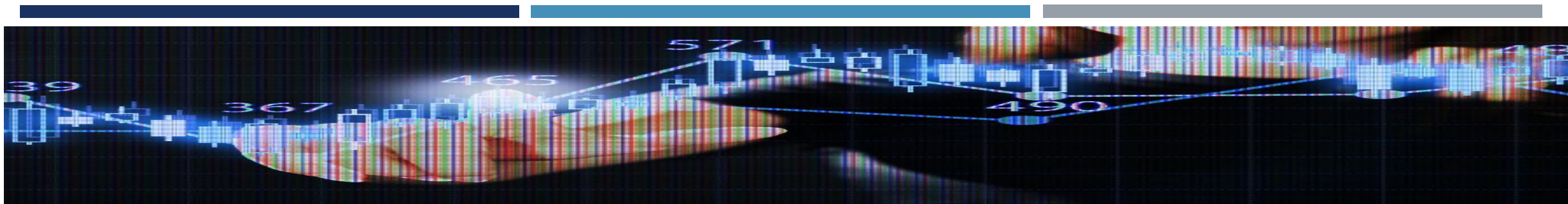
In the Homeric tradition, the mirror metaphor is employed in DPH or comparative sentences. The field of study is concerned with the interrelationship between groups of phrases in the context of phrase group realizations theory. The relationship between number groups and groups of sentences in number theory for the purpose of solving sentences (or paraphrasing to homologize sentences) is of interest.

Focus: The Fibonacci series represents a number group (number theory) and a sentence group. It also encompasses reductions and equivalences (Planat et al.). Furthermore, it examines the interconnections and roles of mathematical language in formal languages.

1.4 Project: Experimentation in the Cloud Digital Text Workshop: New Solutions for Supercomputing Environments.

Focus: The concept of similarity is fundamental to the concept of synthetic homology.

It can be reasonably deduced that: 1. The initial formal process commences with mathematical languages. 2. A potential methodology for transferring data from NLP to AI is presented.



## PRIOR EXPERIENCE IN USING 2020-2023 PRODUCTS

### 1-PROJECT: LANGUAGE RESOURCES FOR AUTOMATIC GENERATION OF NATURAL SIGN LANGUAGE

[https://www.researchgate.net/publication/339150012\\_Mathematical\\_and\\_Physical\\_Analysis\\_of\\_NLG\\_Language](https://www.researchgate.net/publication/339150012_Mathematical_and_Physical_Analysis_of_NLG_Language):

The research interest score for this article is 39.5, which places it in the top 95% of research articles on ResearchGate. A comparison by publication date reveals that this article's research interest score is higher than 98% of research articles published in 2020. A comparison by discipline is also provided. The research interest score for this article is higher than 97% of research articles related to information technology and policy.

#### PUBLICATIONS

- Bucciarelli, R., et al. "Mathematical Analysis and Physics of NLG Languages." (2020) Mathematical Analysis and Physics of NLG Languages.

[https://scholar.google.com/scholar?hl=it&as\\_sdt=0%2C5&q=A.+Bendjoudit&btnG=](https://scholar.google.com/scholar?hl=it&as_sdt=0%2C5&q=A.+Bendjoudit&btnG=) .

- LANDI, E. Bucciarelli R.; LANDI, A. From grammar to poetic text: lessons in linguistics. Loffredo Editore Napoli, 2000. Bucciarelli, R., Falco, V., & Savarese, G. (2018). Linguistic resources for automatic natural sign language generation. EDUCATION AND TEACHING. International journal of education and training sciences, 16 (2), 13-24. [https://scholar.google.com/scholar?hl=it&as\\_sdt=0%2C5&q=Ritamaria+Bucciarelli++&oq=R](https://scholar.google.com/scholar?hl=it&as_sdt=0%2C5&q=Ritamaria+Bucciarelli++&oq=R).

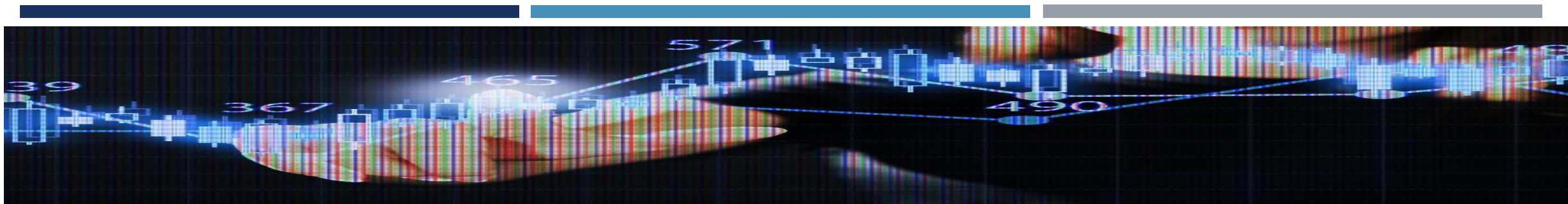
- Bucciarelli, R. (2014). Lexicography for linguistic corpus description and analysis. Training and Teaching, 12 (4), 389-396.

[https://scholar.google.com/scholar?hl=it&as\\_sdt=0%2C5&q=A.+Bendjoudit&btnG=](https://scholar.google.com/scholar?hl=it&as_sdt=0%2C5&q=A.+Bendjoudit&btnG=)

[https://scholar.google.com/scholar?hl=it&as\\_sdt=0%2C5&q=Ritamaria+Bucciarelli++&oq=](https://scholar.google.com/scholar?hl=it&as_sdt=0%2C5&q=Ritamaria+Bucciarelli++&oq=).

- R Bucciarelli, R., M., & Villari, P. (2016). Working tools: tablets for inclusive education. EDUCATION AND TEACHING. International Journal of Education and Training Sciences, 14(2), 203-210.

[https://scholar.google.com/scholar?start=10&q=Ritamaria+maria+Bucciarelli&hl=en&as\\_sdt=0.5](https://scholar.google.com/scholar?start=10&q=Ritamaria+maria+Bucciarelli&hl=en&as_sdt=0.5).



## 2- PROJECT: TECHNOLOGIES AND NEW COMMUNICATION MODELS FOR TEACHING ESP DIGITAL INTELLIGENCE

**Overall goals:** to transfer the different textures (ESP-DPH) LNG-NLP through the application of cloud techniques.

**Brief focus on:** ESP professional languages.

**Description;** input languages and methodology for professional text processing.

### STATISTICS

The following link provides access to statistical data:

[https://www.researchgate.net/publication/333017162\\_Technologies\\_and\\_new\\_communication\\_models\\_for\\_a\\_didactic\\_of\\_digital\\_intelligence\\_ESP](https://www.researchgate.net/publication/333017162_Technologies_and_new_communication_models_for_a_didactic_of_digital_intelligence_ESP) .

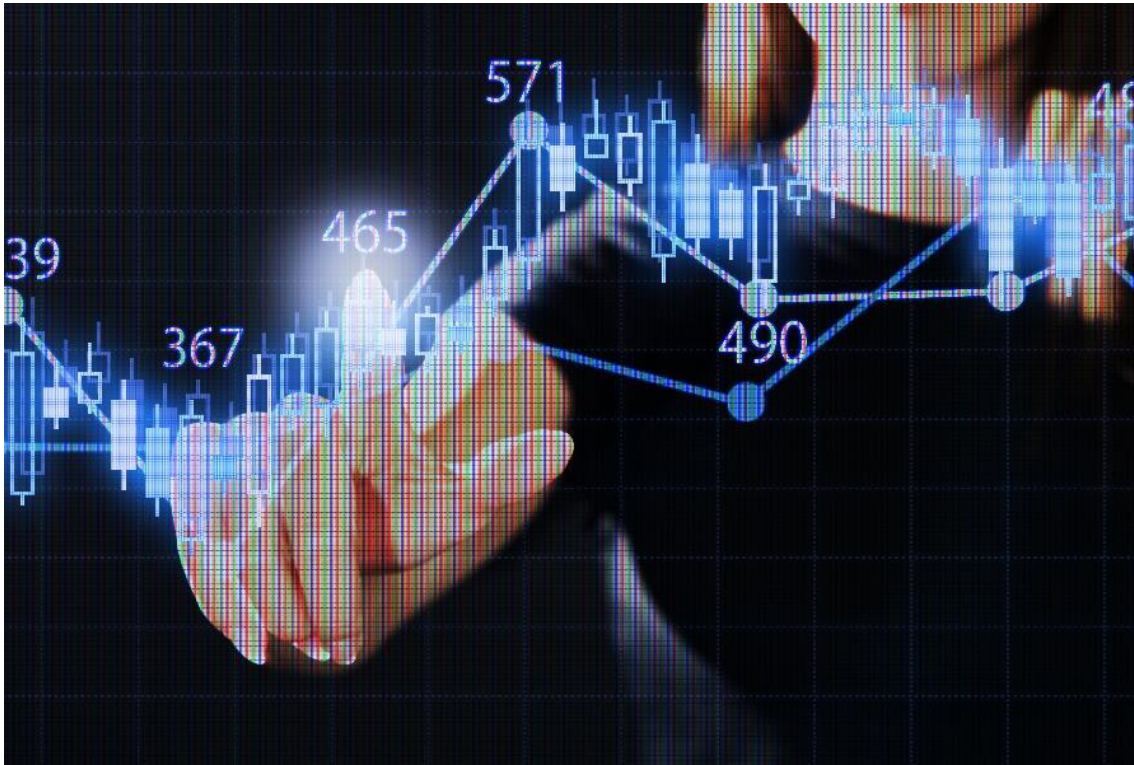
The research interest score for this article is higher than 98% of research articles on ResearchGate. A comparison by publication date reveals that this article's research interest score is higher than 99% of research articles published in 2019. A comparison by discipline reveals that this article's research interest score is higher than 98% of research articles in the same discipline published in 2019. The research interest score for this article is higher than 98% of research articles related to the following subject areas: Computing in the Social Sciences, Arts, and Humanities.

[https://www.researchgate.net/publication/330728178\\_Technologies\\_and\\_languages\\_in\\_the\\_society\\_of\\_acronyms/stats](https://www.researchgate.net/publication/330728178_Technologies_and_languages_in_the_society_of_acronyms/stats).

The research interest score of this article is higher than 96% of research articles on ResearchGate. A comparison by publication date reveals that the research interest score for this article is higher than 99% of research items published in 2019. A comparison by discipline reveals that the article in question is more closely aligned with the following disciplines: The research interest score for this item is higher than 97% of research items related to applied mathematics.



## 2- PROJECT: TECHNOLOGIES AND NEW COMMUNICATION MODELS FOR TEACHING ESP DIGITAL INTELLIGENCE



### PUBLICATIONS

- Ritamaria Bucciarelli, Roberto Capone, Marianna Greco, Javier Julian Enriquez, Francesca Santoro, Raffaele Marcone, Francesco Saverio Tortoriello (1), Technologies and new communication models for teaching ESP digital intelligence (September 2019). Technologies and new communication models for teaching ESP digital intelligence. In New methods of teaching and learning Ememitalia 2019 (Vol. 8) <https://hal.science/hal-03725354/>.
- R. Bucciarelli Capone, FS Tortoriello, M. Greco, G. Savarese, Javier Enriquez, Learning Analytics - Scientific description and heuristic validation of NLG languages in Volume 15, no. 3 (2019) Journal of e-Learning and Knowledge Society - Focus on: Learning Analytics: for a dialogue between teaching practices and educational research, 251-261 R. Bucciarelli. <https://hal.open-archives.fr/hal-03690838/> .
- Bucciarelli, R., Marcone, R., Santoro, F. and Dolci, C. (2017). Technology and languages of the new economy. Salerno IRIS in the text (Bucciarelli, 2017).

[https://issue.com/pensamultimedia/docs/f\\_i\\_unique-compressed](https://issue.com/pensamultimedia/docs/f_i_unique-compressed).



### Segment :3- Implementation and Digital Intelligence

#### 3- DIGITAL INTELLIGENCE: TECHNOLOGY MODELS – PROCESSES

**Experts and authors: P. Villari, M., F.; R. Bucciarelli et. al.**

[https://www.researchgate.net/publication/337945944\\_Intelligenza\\_digitale\\_Word\\_-\\_Tool\\_modelli\\_tecniche\\_e\\_tecnologie\\_L-MI](https://www.researchgate.net/publication/337945944_Intelligenza_digitale_Word_-_Tool_modelli_tecniche_e_tecnologie_L-MI)

Research Interest Score: 46.2; Compared to all research articles: Your article's research interest score is higher than 96% of the research articles on ResearchGate. Comparison by publication date: Your paper's research interest score is higher than 98% of the research papers published in 2019. Compare by discipline: your paper's research interest score is higher than 96% of related research papers: Mathematics Education.

#### Software:

©Race Type M. Renda, A R. Bucciarelli POLO Team University of Salerno, corpus of lemmas for the completion of words and sentences and paraphrases of sentences

©Intelligenza Digitale Acro - Parola R. Bucciarelli; P. Villari, MF, R. Marcone, F. Santoro: DB language development environments and text reformulators with natural language cloud techniques.

©Word-Tool, R. Bucciarelli; P. Villari, FM, M. Greco, R. Marcone, F. Santoro: Text editor for text formulation and NG language conversion (L1 to L2), real-time translator.

#### PUBLICATIONS

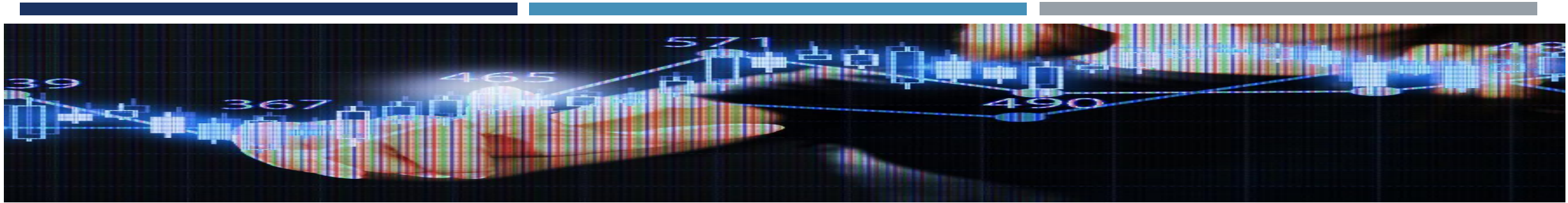
➤ Bucciarelli, R., M., & Villari, P. (2016). Working tools: tablets for inclusive education. *Training and teaching*, 14 (2 Suppl.), 203-210.

[https://scholar.google.pt/scholar?hl=it&as\\_sdt=0%2C5&q=Work-Tools%3A+Tablet+for+Inclusive+Education&btnG=.](https://scholar.google.pt/scholar?hl=it&as_sdt=0%2C5&q=Work-Tools%3A+Tablet+for+Inclusive+Education&btnG=)

➤ Bucciarelli, R., Falco, V., & Savarese, G. (2018). Language resources for the automatic generation of natural sign language. *Education and training*, 16 (2 suppl.), 13-24.

[https://scholar.google.pt/scholar?hl=en&as\\_sdt=0%2C5&q=Linguistic+resources+for+automatic+generation+of+natural+sign+language&btnG=.](https://scholar.google.pt/scholar?hl=en&as_sdt=0%2C5&q=Linguistic+resources+for+automatic+generation+of+natural+sign+language&btnG=)

[https://accademiadellacrusca.it/it/contenuti/banche-dati-corpora-e-archivi-testuali/6228.](https://accademiadellacrusca.it/it/contenuti/banche-dati-corpora-e-archivi-testuali/6228)



#### 4- PROJECT: DIGITAL LITERARY COMMUNICATION: DPH TECHNIQUES AND MODELS: QUANTUM PHYSICS VALIDATION AND IMPLEMENTATION

##### EXPERTS:

**Michael Planat; Marcelo M. Amaral; Mud Fang; Raymond Asim**

**Max Silberstein; Andrea Fernanda Rodrigo**

[https://www.researchgate.net/publication/344626660\\_DPH\\_Validation\\_and\\_implementation\\_of\\_quantum\\_physics\\_the\\_Fano\\_solving\\_plan\\_of\\_Dantesque\\_Rhetoric](https://www.researchgate.net/publication/344626660_DPH_Validation_and_implementation_of_quantum_physics_the_Fano_solving_plan_of_Dantesque_Rhetoric)

The Statistics Research Interest Score is 56.7, with a total of 162 recommendations.

Law 560: In comparison to all other research papers, the research interest score of your article is higher than that of 97% of the research papers on ResearchGate. A comparison by publication date reveals that the research interest score of your article is higher than 99% of the research papers published in 2020. A comparison by discipline reveals that the research interest score of your article is higher than 97% of research articles related to artificial intelligence and computational linguistics. The research interest score of this article is higher than 97% of research articles related to algorithms.

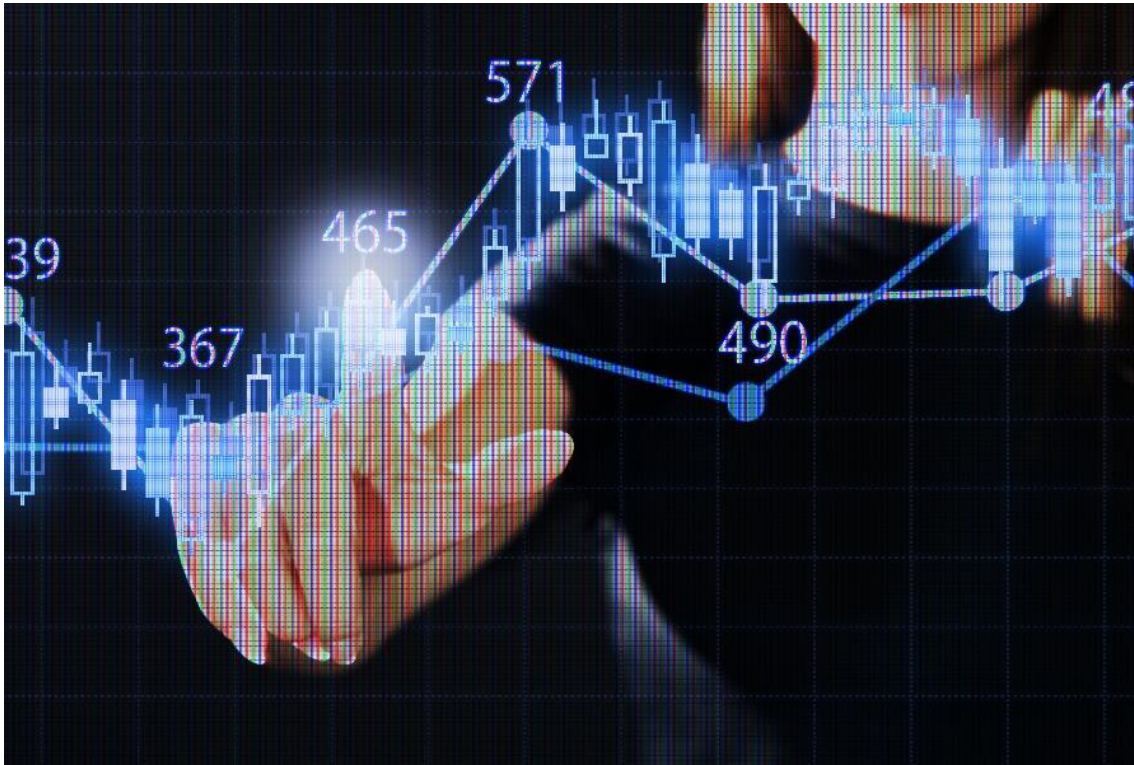
**Model:** Musicological-Quantitative

**Objectives:** Sentiment analysis; Recursive processes - comparison of models: Dante Alighieri between rhetoric and graphs; Sentiment analysis: Comparative analysis, Fano's plane analysis of the Adagietto in Visconti's *death in Venice* - Dante Alighieri's *La Divina Commedia*.

**Competencies to be acquired:** this course will examine recursive processes and structures, with a particular focus on recursion in language. The development of recursive transition networks for the processing of applications of quantum techniques and theories of comprehension. A comparison of tonal analysis B is presented below. The objective of focal analysis DA is to describe the emotional traits of Dante's triplet through the lens of Fibonacci theories. Translate the data into a formal language for emotion detection and utilize linguistic computational tools for scientific validation.



## 4- PROJECT: DIGITAL LITERARY COMMUNICATION: DPH TECHNIQUES AND MODELS: QUANTUM PHYSICS VALIDATION AND IMPLEMENTATION



### Overview of the study approach and the requisite skills

Guiding text: Planat-literary words and a fundamental homomorphism - The dominant geometric linguistic context.

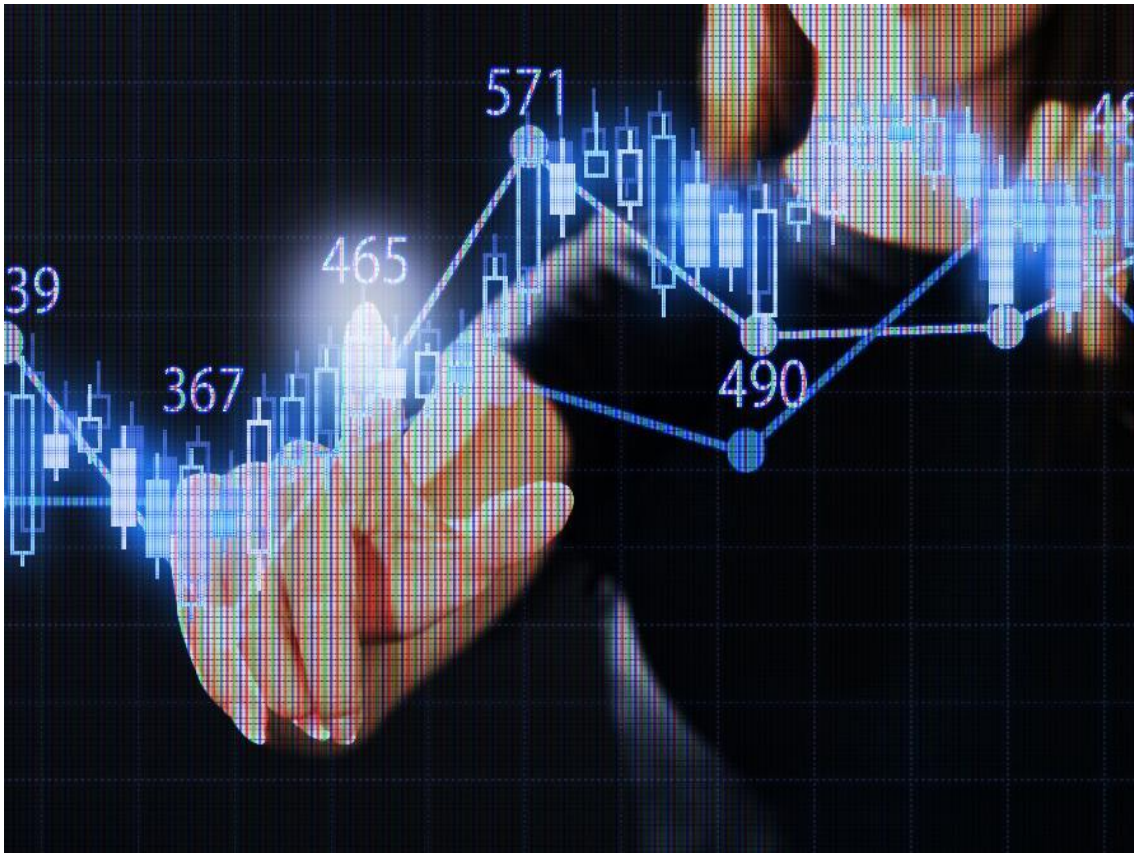
The objective of this study is to gain an understanding of the problem presented in the mathematical file. A study of Kurt Gödel's contributions to musical logic offers insights into the life and work of a polymath who was a logician, philosopher, and mathematician. From Gödel's theorem to feedback, and from axiomatic reasoning to the theorem. The extension theorems DEF axiom rules, Mumon and Godel.

The concept of recursive structures and processes is discussed in Gödel, Escher, Bach (pp. 137, 160). This is followed by an examination of linguistic recursion, descriptions, and computational systems.

J. Pustejovsky's generative lexicon provides a theoretical framework for lexical semantics, which is situated within the broader context of the Qualia structure theory and is informed by a range of empirical studies in computational tools and lexicology.

A study of the description and application of graph theory in the field of network science.

#### 4- PROJECT: DIGITAL LITERARY COMMUNICATION: DPH TECHNIQUES AND MODELS: QUANTUM PHYSICS VALIDATION AND IMPLEMENTATION

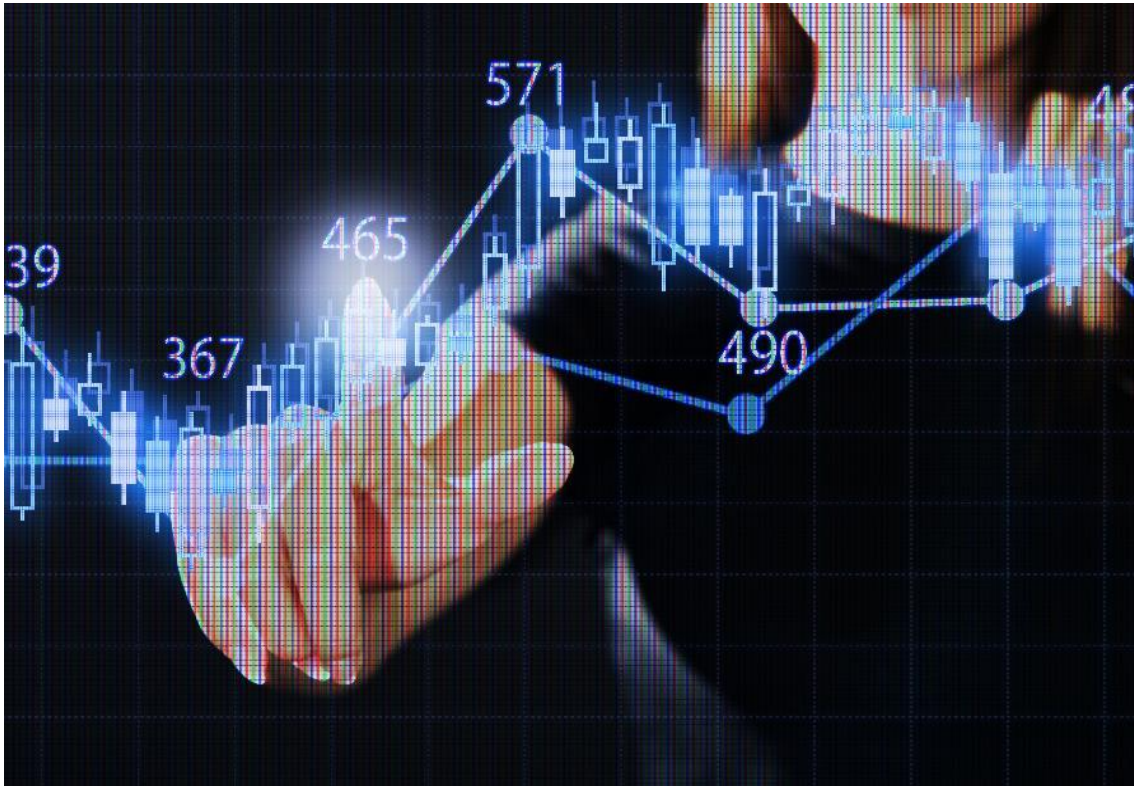


##### Analysis of the guide text:

- ✓ Planat, two-letter words and a fundamental homomorphism, the dominant geometric linguistic context 1, for understanding the problem (fil. Mat): A study of musical logic in Kurt Gödel, a logician, philosopher, and mathematician, reveals insights into Gödel's theorem and its applications in axiomatic reasoning, including extensions of the theorems and axiom rules. Gödel's work is also linked to Mumon and Godel.
- ✓ Recursive structures and processes (Gödel, Escher, Bach, pp. 137, 160), recursive linguistic descriptions and computational systems.
- ✓ The generative lexicon of J. Pustejovsky to outline a theory of lexical semantics, in the structure theory of the *Qualia* and interesting for studies for computational tools for lexicology.
- ✓ Studies for the description and application of graph theory in Network Science.



#### 4- PROJECT: DIGITAL LITERARY COMMUNICATION: DPH TECHNIQUES AND MODELS: QUANTUM PHYSICS VALIDATION AND IMPLEMENTATION



##### **Acquired experience:**

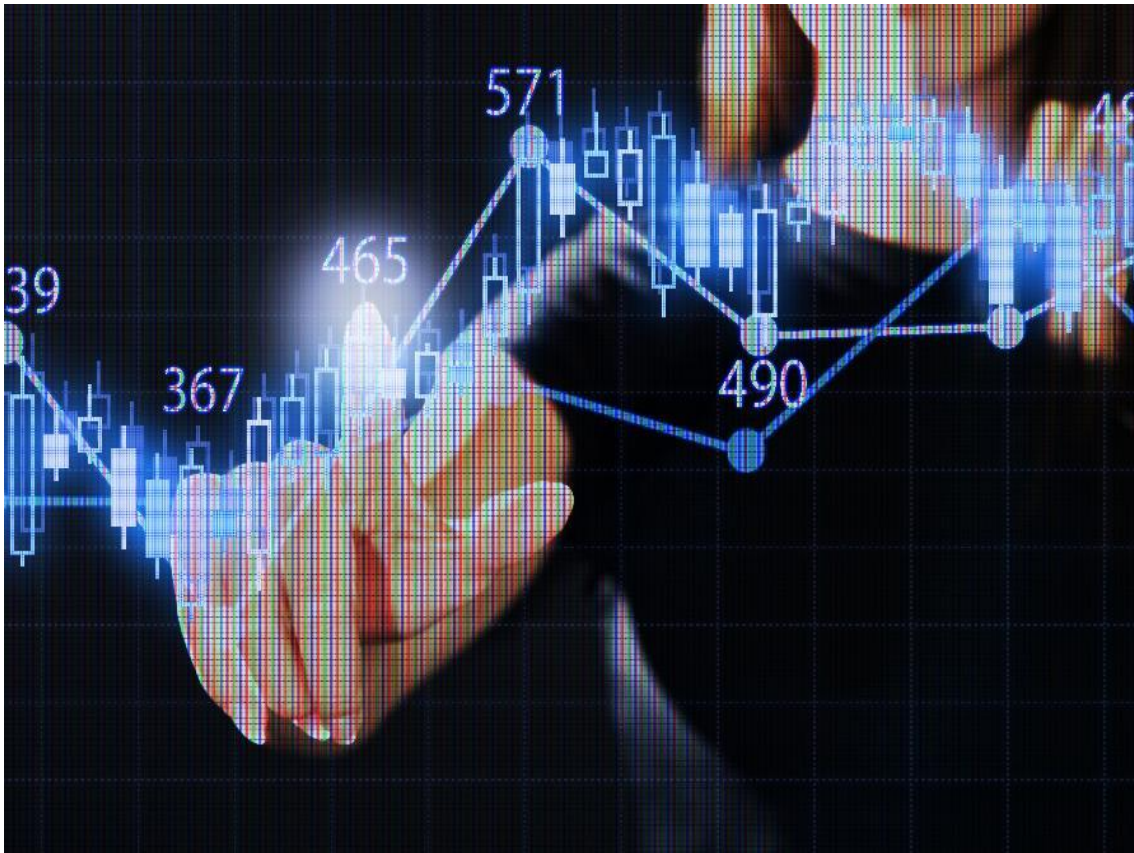
Sentence decomposition is a fundamental concept in semantic theory, group and graph theories, and quantum physics theories. It is also a key area of investigation in the study of SA in relation to the formal sphere. The subject matter encompasses recursiveness in musical and linguistic structures, as well as the concept of geometric structures, mathematical functions, physical and automatic theories.

**Insight:** the study of recursive processes and comparative models is a field of inquiry that has been the subject of considerable interest in recent years. Dante Alighieri's work represents a synthesis of rhetoric and graphics, with the objective of achieving a comprehensive understanding of the human condition. Sentimental analysis Comparative analysis: Fano's analysis of the *Adagietto in the Death of Visconti in Venice*, as presented in Dante Alighieri's *Divine Comedy*.

**Description:** This paper will examine recursive processes and structures, with a particular focus on recursion in linguistics. The objective of this research is to develop recursive transition networks for processing applications of quantum understanding techniques and theories. A comparison of tonal analysis B is presented below. The purpose of phonon analysis is to describe the emotional traits of Dante's triplet using a test guide derived from Fibonacci theories. The data must be transferred into a formal language for the purpose of emotion detection and the use of computational language tools for scientific validation.



#### 4- PROJECT: DIGITAL LITERARY COMMUNICATION: DPH TECHNIQUES AND MODELS: QUANTUM PHYSICS VALIDATION AND IMPLEMENTATION



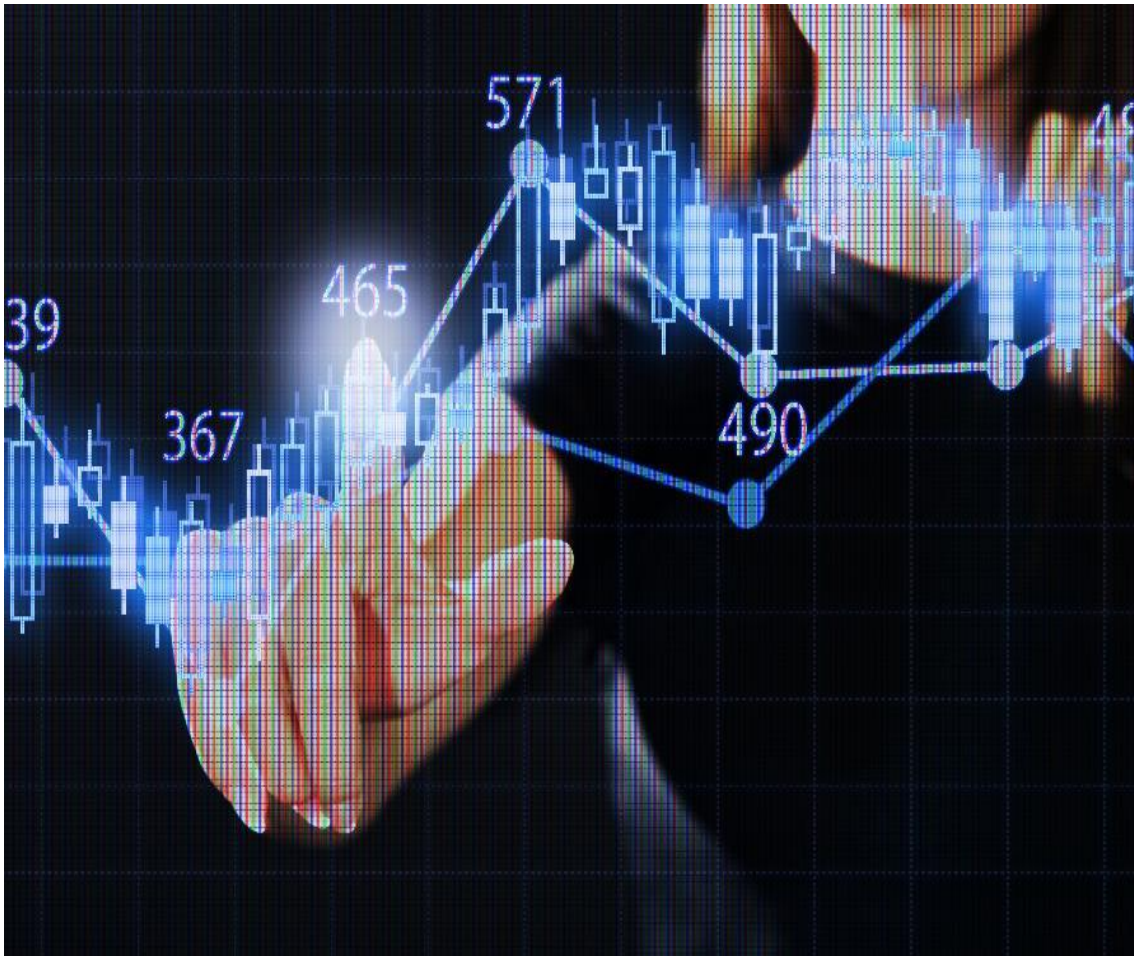
MM.FF.NN. M. PLANAT: Communications and Vision Support Papers

- Planat, M.; Aschheim, R.; Amaral, M.M.; Zanna, F.; Irwin, K. (2016), "Quantum Information in Protein Codes, 3-Varieties, and Kummer Surfaces," *Symmetry* 2020, 13, 1146.
- Planat, Michel, et al. (2020). "Quantum computation and measurements from an exotic R4 spacetime." *Symmetry* 12.5 (2020): 736.
- Planat, Michael. "It from qubits: A Method for Drawing Quantum Contextuality." *Information* 5.2 (2014): 209-218.
- Planat, Michael. "Two-letter words and a fundamental homomorphism governing geometric contextuality." arXiv preprint arXiv: 1605.07118 (2016).
- Planat, M., & Saniga, M. (2007). On Pauli's papers from N-qudits. arXiv preprint quant-ph/0701211.

Michel Planat offers a quantum interpretation of the triple Paradise of Canto XXXIII of the *Divine Comedy* and the Inferno of Canto III of the *Divine Comedy*. In the Fano Triangle, we are grateful for the support and modes of communication provided by ResearchGate.

**Research Hypothesis:** M. Planat: the process of reading, providing support, and applying expert judgment is fundamental to the field of study.

## 5. PROJECT EXPERIENCE: HOMER DIGITAL COMMUNICATION DESIGN IN A QUANTUM SOCIETY: SMART TECHNOLOGIES AND DIGITAL INTELLIGENCE (PROJECT: TECHNOLOGIES, ROBOTICS AND NANOTECHNOLOGIES FOR DIGITAL EDUCATION)



**EXPERTS:** Online Communication

Mathematical Model Data Collection Process

Michael Planat, Marcelo M. Amaral; Mud Fang; Raymond Asim; Max Silberstein; Andrea Fernanda Rodrigo

[https://www.researchgate.net/publication/342987547\\_SMART\\_TECHNOLOGIES\\_AND\\_DIGITAL\\_INTELLIGENCES\\_CROSS\\_TECHNIQUES\\_AND\\_VALIDATIONS](https://www.researchgate.net/publication/342987547_SMART_TECHNOLOGIES_AND_DIGITAL_INTELLIGENCES_CROSS_TECHNIQUES_AND_VALIDATIONS)

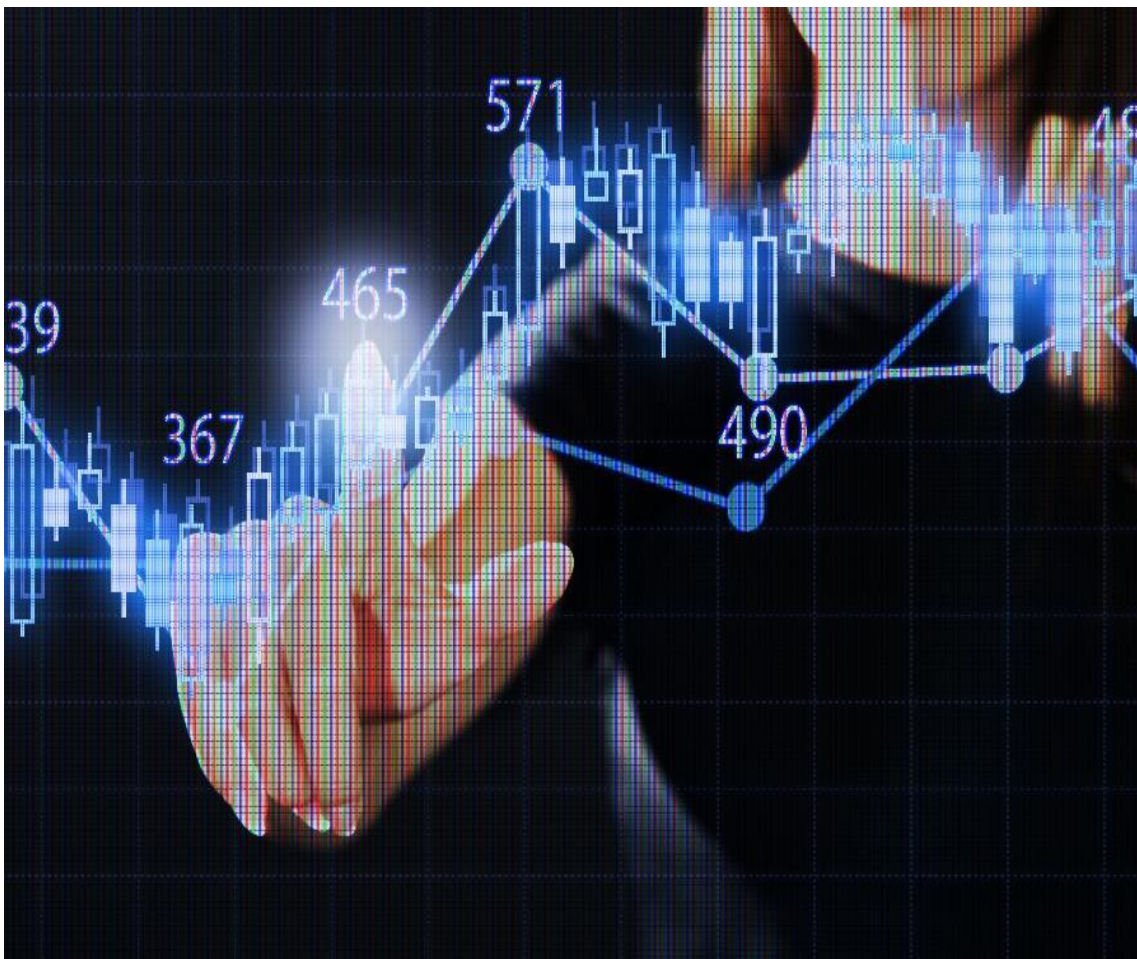
The research interest score is 54.1, representing an 82.72% recommendation rate. Full-text reading accounts for 5.64% of all research articles. The research interest score of this article is higher than 96% of research articles on ResearchGate, as well as those published in the same period and in the fields of computer science, mathematics, natural sciences, engineering, and medicine. The research interest score of this article is higher than 99% of research articles published in 2020. In comparison to the discipline, the research interest score of this article is higher than 97% of research articles related to: The field of computing in the social sciences, arts, and humanities.

**Tools:** a probabilistic analysis of the elements in semantic Web environments for quantum computation was conducted using the NooJ system. The results were published in Digital Intelligence A.W.

**Objective:** to examine the Homeric tradition in the DPH sentence. The mirror metaphor is employed to describe a world, a culture, or a tradition. Furthermore, the transformation of a literary text into a digital text is investigated through the lens of natural language processing (NLP).



## 5. PROJECT EXPERIENCE: HOMER DIGITAL COMMUNICATION DESIGN IN A QUANTUM SOCIETY: SMART TECHNOLOGIES AND DIGITAL INTELLIGENCE (PROJECT: TECHNOLOGIES, ROBOTICS AND NANOTECHNOLOGIES FOR DIGITAL EDUCATION)



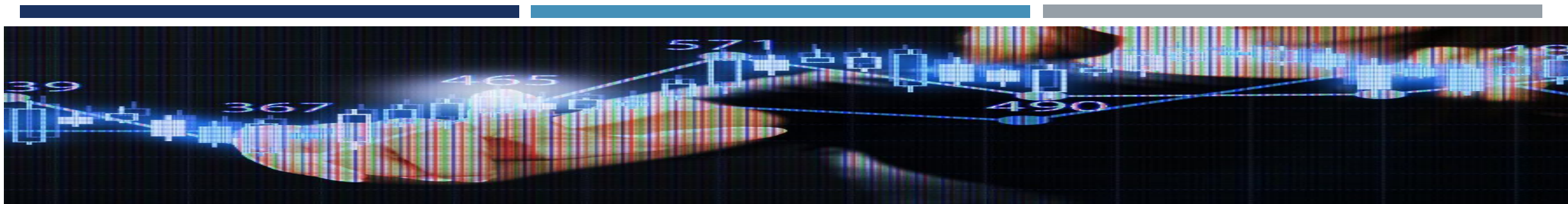
### Products:

Bucciarelli, R., Tortoriello, F. S., Rodrigo, A. A., Enriquez, J. J., La Ragione, C. C., & Veronesi, I. (2021, February). The integration of intelligent technologies and digital intelligence. In the webinar series "Theories and Practices of Annotation through Domain-Specific Languages," which spanned from Fall 2020 to Spring 2021, Ritamaria Bucciarelli and colleagues presented a lecture entitled "Intelligent Technologies and Digital Intelligence." The presentation is available for download in PDF format at the following link: <https://cophilab.ilc.cnr.it/euporia2021/slides/08-bucciarelli-et-al-ita.pdf>.

For more information about the webinar, please visit the following website: <http://www.ilc.cnr.it/it/content/webinar-euporia-2021-euporia-2021>

<https://hal.science/hal-03741253>





## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS

**Project:** the study of nonlocal communication structures is enhanced using graphic coverings. These coverings facilitate the description, analysis, and validation of such structures. The research interest score for this article is 14.7, which is higher than the average score for all research articles. The research interest score of this article is higher than 89% of research articles related to the following disciplines: Computational Linguistics; Respect by Discipline. The research interest score for this article is higher than 87% of research articles related to: The field of Computation Theory.

[https://www.researchgate.net/publication/355116190\\_GRAPHIC\\_COVERINGS\\_TO\\_STUDY\\_NON\\_LOCAL\\_STRUCTURES\\_OF\\_COMMUNICATION\\_DESCRIPTIONS\\_ANALYSIS\\_VALIDATIONS\\_Magazen\\_Lieux\\_methodologies\\_processus\\_et\\_validations/stats](https://www.researchgate.net/publication/355116190_GRAPHIC_COVERINGS_TO_STUDY_NON_LOCAL_STRUCTURES_OF_COMMUNICATION_DESCRIPTIONS_ANALYSIS_VALIDATIONS_Magazen_Lieux_methodologies_processus_et_validations/stats).

### Reference model

This study examines the use of graph coverings in the analysis of nonlocal structures in proteins, music, and poems. The authors of this study are Michel Planat, Raymond Aschheim, Marcelo M. Amaral, Fang, and Klee Irwin.

The following references are included in this study:

Planat, M., Aschheim, R., Amaral, MM, Fang, F., & Irwin, K. (2021). The use of graphs in the study of nonlocal structures in proteins, music, and poems. For further information, please refer to Sci, 3 (4), 39: <https://www.mdpi.com/2413-4155/3/4/39/htm>.

### Description:

Analogy Process: The team produces analogies. In the first analogy, we explore structural similarities in three different languages: protein language, whose primary letters are amino acids; musical language, whose primary letters are annotated; and poetic language, whose primary letters are in the alphabet. We then proceed to a mathematical theory. Our mathematical theory of secondary structures in proteins, music, and poetry is based on the concept of finitely generated groups and corresponding graphical superpositions. This concept is explained in the Planat project, "Mathematics and poetry, in view of machine learning," Planat *et al.* (2021). Our current group theoretical approach to protein language ... It could be converted into an understanding of poetic language, as well as an understanding of some other domains. In this paper, French physicists have already developed an automated process for reducing classes and categories into groups according to finite groups. Our team has reported their results in NooJ's grammar.

## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



**Objective:** to transfer the mathematical theories of M. Planat into formal linguistic structures.

### Description

Descriptions of the techniques employed is provided below. In accordance with the assumptions proposed by M. Planat and colleagues, we proceed as follows:

1. Transfer data from the Seq.
2. Transfer of the Baudelaire text from the mathematical code, with quantum detections (SA), to the lexicon-grammatical code (NooJ).
  - 2.1. Transfer of data to the Nooj environment for the construction and analysis of graphs for frequency validation.
  - 2.2. Construction of the corpus and local grammars.
3. Translation, reformulation, and editing of the text into digital.

This process results in the transformation of the input textual typology (literary into target typology) from a fixed, homologous, and synthetic state.

The process of reading, providing support, and exercising expert judgment is fundamental to the advancement of knowledge.

-Graphic coverings for the study of nonlocal structures in protein, music, and poetry

The following report presents the findings of the analysis. The analysis features graphs, translations, and reformulations created with the software on the GPT model, accessible via the following link: <https://www.femto-st.fr/en/Research-departments/DISC/Research-groups/AND>.



## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



A description of the reproductive process is provided below. The French language has been reformulated in digital form.

### Seq. 2 XVI

Chinese see time in cats' eyes.

[...] The boy from the Celestial Empire hesitated at first; then, changing his mind, he replied, I will tell you. A few moments later he reappeared, holding a large cat in his arms, and looking him, as they say, straight in the eye, he stated without hesitation: 'It is not yet noon. "What was true [...]

This represents an irrefutable validation in the mathematical logic of data transfer from narrative textual typology to digital typology, marking the beginning of a formal process.

*Graph coverages and group actions are closely related.*

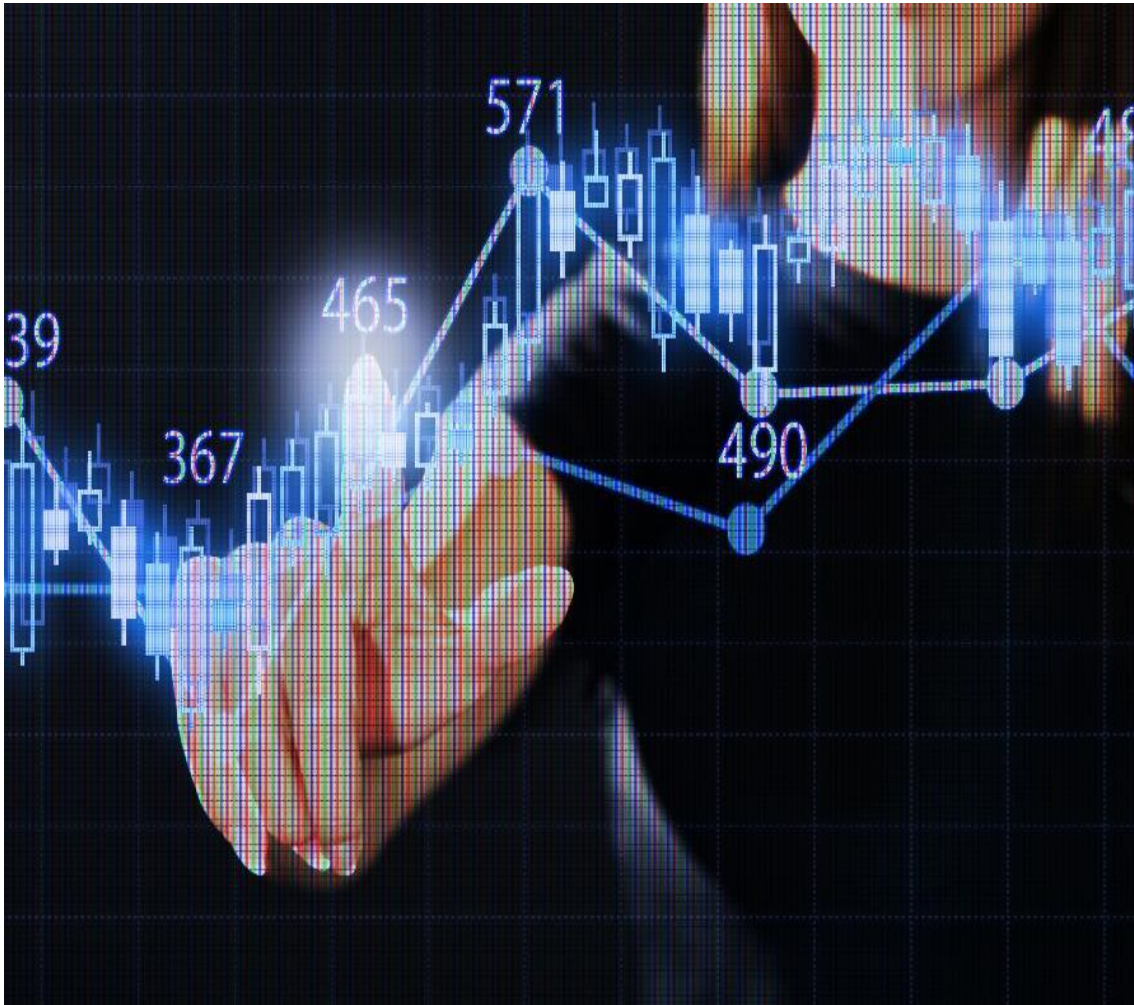
*We start with an enumeration of integer partitions of  $d$  that satisfy.....*

**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  $F_r$ ) 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	624	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



## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



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

The Fibonacci series is calculated, and homophonic iteration is performed:

*Game 1 of cé 1 on 2 ste 3 E 5 mpire 8 h 13 sita first; then, delighting, he replied, "I will tell you: 1 1 2 3 5 8 13.*

Sentence M. Word or idiomatic = The Chinese see time in the eyes of cats.

*... .... looking at it, as they say, in the whites of the eyes... = N 0 V as C 1.*

## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



NooJ, Max Silberztein -Digital Intelligence, W.T, CHAT, GPT Technologies, R. Bucciarelli *et al.*

M. Renda and A. R. Bucciarelli, POLO team, University of Salerno, Corpus of Lemmas for Word and Sentence Completion and Sentence Paraphrasing.

R. Bucciarelli, P. Villari, M. F., R. Marcone, and F. Santoro, Digital Intelligence Acro: Word, Language Development Environments and Text Reformulator with Natural Language Cloud Techniques.

The Word Tool, developed by R. Bucciarelli, P. Villari, M. Greco, R. Marcone, and F. Santoro, is a text formulation editor and NLG language conversion (L1 to L2) system that functions as a real-time translator.

NooJ M. Silberztein Digital Environment

Graphic ... .... looking at it, as they say, in the whites of the eyes ... = N 0 V as C 1





## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



NooJ

File Edit Lab Project Windows Info

C:\Users\raffa\OneDrive - 绥化市教育学院\Documents\NooJ\Projects\horloge.net

3 / 6 TUs Characters Tokens Digrams

Show Text Annotation Structure

Un jour un missionnaire, se promenant dans  
oublié sa montre, et demanda à un petit garçon  
Le gamin du céleste Empire hésita d'abord :  
dire ». Peu d'instants après, il reparut, tenant  
regardant, comme on dit, dans le blanc des  
encore tout à fait midi. » Ce qui était vrai.  
Pour moi, si je me penche vers la belle Félin  
de son sexe, l'orgueil de mon cœur et le par  
soit le jour, dans la pleine lumière ou dans l'  
je vois toujours l'heure distinctement, toujou  
comme l'espace, sans divisions de minutes  
pas marquée

Tokens in: horloge  
129 different tokens

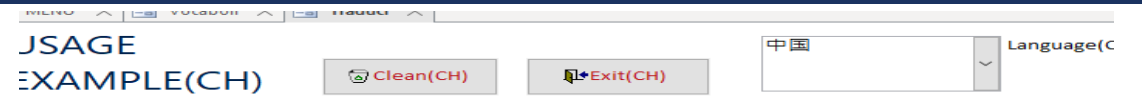
Freq	Tokens
1	orgueil
1	le
1	Ce
1	promenant
1	immobile
1	moi
2	jour
1	grande
1	chats
1	nuit
2	mon
2	se
1	au
1	marquée
2	je
1	Il
1	vous

Reset Select all Filter Export

Language analysis and token detection



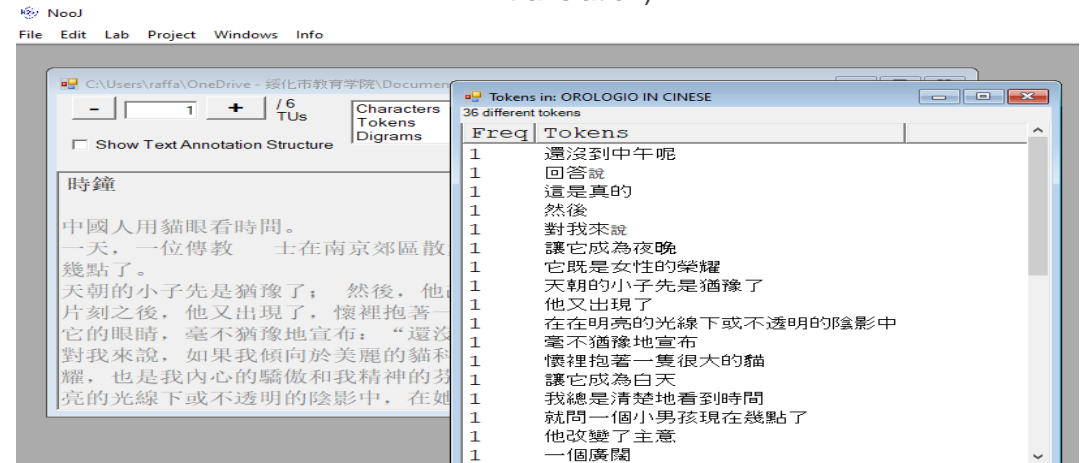
## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



中国人用猫眼看时间。  
[...] 天朝之子起初有些犹豫；然后，他改变了主意，回答说：“我会告诉你的。”  
片刻之后，他又出现了，怀里抱着一只很大的猫，用他们的话说，直视着它的眼睛，他毫不犹豫地肯定地说：“还没到中午呢。”这是真的。 [...]»

天朝之子起初有些犹豫；然后，他改变了主意，回答说：“我会告诉你的。”  
片刻之后，他又出现了，怀里抱着一只很大的猫，用他们的话说，直视着它的眼睛，他毫不犹豫地肯定地说：“还没到中午呢。”这是真的。 [...]»

Translation: Transferring C. Baudelaire's text into digital languages (French to Chinese translation)



The NooJ language analysis and token detection software

## 6. PROJECT-EXPERIENCE: THE DIGITAL TEXT WORKSHOP CLOUD, NEW SOLUTIONS FOR SUPERCOMPUTING ENVIRONMENTS



This study offers a tribute to William Shakespeare and presents a phono-tonal analysis of language reformulation in the musicality of tenses.

ESempio  
D'USO

Italiano

INFORMAZIONE

In questo primo verso c'è già un fenomeno di sequenzialità vocale ( sette setti su undici ) e l'iterazione delle vocali omotipiche [EE ...EE] di vocali omotipiche dal punto di vista del luogo dell'articolazione . Le medesime vocali sono coinvolte in un parallelismo pervasivo [EE...EE] ed in una specularità ancora più forte [EE]EE] realizzati in un fenomeno di dominanza sequenziale di forte potere evocativo . La sequenzialità consonantica è evidente nell'iterazione [LN,N] rafforzata dal parallelismo omofonico LN,NLN con un evidente effetto anagrammatico [ulna] che è di richiamo dell'astro , non citato , ma evocato nel verso.

Fenomeno di sequenzialità vocale ( sette setti su undici ) e l'iterazione delle vocali omotipiche [EE ...EE]

USAGE  
EXAMPLE

English

In this first verse there is already a phenomenon of vowel sequentiality ( seven locations out of eleven ) is the iteration [EE ...EE] of homotypic vowels from the point of view of diaphragmatic place. The same vowels are involved in a pervasive parallelism [EE...EE] and in an even stronger specularity [EE]EE] realized in a phenomenon of sequential dominance of strong evocative power. The consonantal sequentiality is evident in the iteration [LN,N] strengthened by the homophonic parallelism LN,NLN with an evident anagrammatic effect [ulna] that is a recall of the star, not mentioned, but evoked in the verse.

ality ( seven locations out of eleven ) is the iteration [EE ...EE] of homotypic vowels from the point of view of diaphragmatic place. The same



6 LITERARY COMMUNICATION IN PRESS.  
TECHNIQUES OF RHETORICAL ANALYSIS IN DANTE ALIGHIERI'S DIVINE COMEDY



PUBLICATIONS

- Veronesi, I., Bucciarelli, R., Tortoriello, FS, Rodrigo, A., Greco, M., , C., & Enriquez, J.J (2023, January). The reason for digital text cloud workshops, new solutions for supercomputing environments. In Formalizing Natural Languages: Applications to Natural Language Processing and Digital Humanities: 16th International Conference, NooJ 2022, Rosario, Argentina, June 14-16, 2022, Revised Selected Papers (pp. 202-213). Cham: Springer Nature Switzerland. Available at:

[https://rehip.unr.edu.ar/xmlui/bitstream/handle/2133/24913/XVI%20International%20NooJ%20Conference%202022-Rosario%2C%20Argentina-Libro%20de%20abstracts.pdf?sequence=3#\\_pagina=37](https://rehip.unr.edu.ar/xmlui/bitstream/handle/2133/24913/XVI%20International%20NooJ%20Conference%202022-Rosario%2C%20Argentina-Libro%20de%20abstracts.pdf?sequence=3#_pagina=37).

[https://link.springer.com/chapter/10.1007/978-3-031-23317-3\\_17](https://link.springer.com/chapter/10.1007/978-3-031-23317-3_17)

- Ilaria Veronesi, Ritamaria Bucciarelli, Francesco Saverio Tortoriello, Andrea Rodrigo, Marianna Greco, Colomba, Javier Julian Enriquez. The cloud digital text workshop, new solutions for supercomputing environments. 2023. HAL reason ID: hal-03919524. Available at: <https://hal.science/hal-03919524>.



6 LITERARY COMMUNICATION IN PRESS.  
TECHNIQUES OF RHETORICAL ANALYSIS IN DANTE ALIGHIERI'S DIVINE COMEDY



PUBLICATIONS

- Validation and Implementation of Quantum Physics: The Solution Plan of Dante's Rhetoric of Fano:  
[https://www.researchgate.net/publication/344626660\\_DPH\\_Validation\\_and\\_implementation\\_of\\_quantum\\_physics\\_the\\_Fano\\_solving\\_plan\\_of\\_Dantesque\\_Rhetoric](https://www.researchgate.net/publication/344626660_DPH_Validation_and_implementation_of_quantum_physics_the_Fano_solving_plan_of_Dantesque_Rhetoric)
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TECHNIQUES OF RHETORICAL ANALYSIS IN DANTE ALIGHIERI'S DIVINE COMEDY



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- Weisstein, E. W. (2007). Fano Plane. <https://mathworld.wolfram.com/>.  
<https://mathworld.wolfram.com/FanoPlane.html> .
- Weisstein, E. W. (2000). Heawood Graph. <https://mathworld.wolfram.com/>.  
<https://mathworld.wolfram.com/HeawoodGraph.html>.
- Bucciarelli, R., Rodrigo, A. F., Enriquez, J. J., & Franceschini, S. (2024). Rhetorical analysis techniques in Dante Alighieri's Divine Comedy. *Aprendo con NooJ*, (4). <https://aprendoconnooj.unr.edu.ar/index.php/revista/article/view/27>.





## SUMMARY AND CONSIDERATIONS

Starting assumptions communication in digital: exploration of NLG languages : focus type of input and type of output. projects and experiences (3).

1. Scientific reference model: a combination of musicological and quantitative analysis, coupled with an in-depth examination of sound and tonal elements. the issue of recursivity and the detection of SA is also worthy of consideration.

2. Relation: the concentration of numerical syntagmas on finite groups and classes.

3. A demonstration of the transformation of literary text into digital text.