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# **USER MANUAL GALLITO 2.0** 64bits

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# 1. INTRODUCTION

The aim of this document is to explain how Gallito 2.0 works. Gallito is a tool suitable for two domains:

#### Research:

Makes it possible to process language samples and extract samples for psycholinguistics experiments, such as term entropy, frequency measured through vector length, similarity between terms, lists of semantic neighbors. All of this is very useful to exercise experimental control or even to do research into the effect of this kind of variables on processing.

#### Technology:

For text categorizers in any domain. In fact, Gallito 2.0 is currently being used as the first module in cloud applications that categorize customer service calls. It can also be used to visualize useful information for marketing departments.

The functionality associated with this application is:

Creation of semantic-vectorial spaces from texts

- Calculation of term significance functions (Entropy or IDF)
- Calculation of vector norm for every term
- Lists of semantic neighbors of a term
- Similarity between terms
- Similarity between existing documents
- Similarity between documents that do not exist in space (pseudodocuments)
- Batch processes (similarities, graphs, neighbors)
- Matrix output in plain text
- Pajek format output for term visualization
- Essay evaluation
- Text Cohesion (sentence-sentence, paragraph-paragraph, etc)
- Dimensions Interpretation

# 2.INSTALLATION

# 2.1.Requirements

In order for Gallito 2.0 to work properly the following components must be installed (they are included in the installation CD and can be downloaded from the Microsoft website):

- Windows 64 bits operating system (Windows 7 or Windows Server)
- Microsoft SDK 4, included in the installation CD
- Microsoft Visual C++ 2010 Redistributable Package (64bits)
- Writing permissions to write in the installation directory

Some knowledge of Latent Semantic Analysis (LSA) and its applications is also required.

# 2.2. Installation procedure

- Access the installation folder and execute the Setup.exe program.
- The following screens will appear to guide you through the installation process:

# 2.2.1. Step one

Welcome screen to product installation, specifying the product to be installed (Gallito 2.0). Click NEXT to continue installing or CANCEL to exit the installation process.



# 2.2.2. Step two

In this screen you must select the directory to for product installation, which by default will be C:\Program Files\elsemantico.com\Gallito\_2.0 64Bits\

Gallito_2.0 64Bits
Select Installation Folder
The installer will install Gallito_2.0 64Bits to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Eolder: C:\Program Files\elsemantico.com\Gallito_2.0 64Bits\ Disk Cost
Install Gallito_2.0 64Bits for yourself, or for anyone who uses this computer:
© Everyone ⊚ Just me
Cancel < Back Next >

If you want to install the product in a directory other than the default directory, select it by clicking BROWSE in the installation window. Clicking this button you will access to a standard Windows directory browser, through which you will be able to select the directory where you want to install Gallito 2.0 (see following image).

Browse for F	older	x
<u>B</u> rowse:	Gallito_2.0 64Bits	•
DalabrasClas	es	
<u>F</u> older:	C:\Program Files\elsemantico.com\Gallito_2.0 64Bits\	
	OK Ca	ncel

Once you select the installation directory, click NEXT to continue the installation process.

### 2.2.3. Step three

In this step the user is warned that clicking NEXT will launch product installation. If you click BACK, you will be able to re-enter the installation information.



#### 2.2.4. Step four

The window shows installation progress as a percentage and the files being copied to the machine on which the product is being installed.

Once the installation process is 100% complete, you will access the next step (see next section) after being informed that the necessary information for the application to work correctly has been entered.

Clicking CANCEL in the progress window halts the installation process.

谩 Gallito_2.0 64Bits	
Installing Gallito_2.0 64Bits	100
Gallito_2.0 64Bits is being installed.	
Please wait	
Cancel < Back	Next >

# 2.2.5. Step five

End of the installation. This screen lets the user know that product installation is complete. By clicking on FINISH you will access the last screen in the installation process.



# 3. SUMMARY OF POSSIBLE ACTIONS

The application makes it possible:

- To generate semantic spaces under various parameters.
- To find the similarity between terms, documents, and pseudodocuments.
- To generate lists of neighbors under various parameters (with the possibility of exporting them to Microsoft Excel).
- To load and save semantic spaces in different formats.
- To generate .txt files from significant matrices.
- To batch process (neighbors, similarity by pairs, similarity matrices)

To do this, the application has a single form or control panel with tabs and drop lists. The application has two basic functionalities:

- Generation of a semantic space.
- Operations on a semantic space (Calculate Similarities, Save Space, Load Space, etc.)

# 4. APPLICATIONS

When the application is launched, a small presentation is deployed, followed by the control screen. From then on, you can create a new semantic space or load an existing space that has been saved in the hard disc.

The screen that appears is the following:



You can start to perform operations using the tabs and drop lists.

### 4.1 Creating a semantic space

To create a semantic space, a corpus is needed. This corpus will be called "reference corpus" and will be a text plain file (.txt extension). The contextual window can be separated by a character or simply by natural-language sentences. In the former case, the separating character (usually "#") have to be between two documents:

Los archivos planos constituyen la forma más básica de una base de datos # Los archivos planos incluyen un campo por cada uno de los elementos que se desean contemplar # La redundancia de elementos es una característica de estos archivos # La base de datos relacional soluciona la redundancia en los datos # Son frutos largos y con sabor # La recogida será buena si ha tenido una buena base como semillero # Los frutos son de color verde # En la recogida es parecida a los demás frutos largos #

To create a semantic space, the following parameters are required:

• No. of dimensions or Accumulated singular value: The number of dimensions must not surpass the total number of documents. The accumulated singular value is expressed as a percentage (with no "%" sign). This percentage reflects the saved dimensionality, that is to say, the dimensionality percentage that will be maintained. In this way, 40% refers to the number of dimensions corresponding to said dimensionality. In extremely large corpora, it will not be possible to calculate this percentage, and so 300 dimensions will be used. These data are entered in the matrix tab in the central panel.

Matrix features	
• Dimensions	2
C Accumulated singular value	

• **Linguistic adjustment:** This option refers to the significance calculation for every corpus term. Log-Entropy or log-IDF can be selected, as well as the absence of these calculations. This information is entered in the matrix tab in the central panel.

_ Li	inguistic adjustment	
	Log * Entropy	
	○ Log * IDF	
	O No aplicar ajuste	

• **Normalizing the U Matrix:** The U matrix (of terms) extracted in the SVDF process is normalized before weighting it applying the weight of each dimension. In this way the effect of term frequency is countered. This information is entered in the matrix tab in the central panel.

Normalization	
Norma	izing the U Matrix

• **Reference corpus:** the path of the text file where the linguistic corpus is stored (in a legitimate format). Click on the button to browse through the directories. This information is entered in the Corpus tab in the central panel.

Reference corpus		

The chosen corpus can be selected in the standard Windows browser.

	HO	► LSA ► corpus ► CIE	car CIE	٩
Organizar 🔻 Nueva carpeta			!≡ ▼ 🚺	(?)
> 🔆 Favoritos	Â	Nombre	Fecha de modifica	Тіро
		CIE 10.txt	05/07/2012 2:49	Text Doo
4 📃 Escritorio	Ξ	CIE 10.txt.bak	28/06/2006 19:54	Archivo
4 🥽 Bibliotecas		🖄 Clasificación de trastornos mentales CIE	28/06/2006 19:53	Docume
Documentos				
🗅 📰 Imágenes				
Música				
Vídeos				
🛛 🎝 🖓 Grupo en el hogar				
4 😹 guille				
> 퉲 .gconf				
\mu .gconfd				
> 퉲 .gnome2				
.gnome2_private	Ŧ	< III		F
Nombre:				•
		A	brir 🔽 Cance	lar

 Document separation: The documents can be separated by a character or simply by naturallanguage sentences. In the former case, by the separating character (usually "#"). In the second case, the number of sentences constituting a document (usually 1) should be established. This information is entered in the Corpus tab in the central panel.

Documents	Documents
character separation	character separation     .      sentence separation     A document is a minimum of 1
A document minimun are 6 words	A document minimun are 3 words
	Rem. words that do not appear in at least 6 📩 document
Rem. words that do not appear in at least G	

- **"A document is a minimum of ... words":** This is the minimum number of terms for a document to be analyzed. This information is entered in the Corpus tab in the central panel.
- "Remove words that do not appear in at least ... documents": The minimum number of documents in which a specific term must appear to be included in the analysis. This information is entered in the Corpus tab in the central panel.

Rem. words that do not appear in at least 6 🔹 docum
---

• **Remove:** Literal occurrences of each of the structures presented are removed. This information is entered in the Remove tab in the central panel.



• Generating a "stop list":

1) In the Structures > Select drop lists, select and enter the structures that you wish to remove. In the left-hand side, you will find the structures composed by more than one term. In the righthand side, you will find simple or single-term structures.

Select drop lists	
Structures composed by mo than one term	re Simple or single-term structures
de nada sirve un abrir y cerrar de ojos	todos ser
	Add

#### 2) In the Remove tab, check the "Additional" box



#### • Creating a space with only one "go list"

The procedure is similar to the previous one. In the Remove tab the "Additional" box is checked and in Structures > Select the structures in the "go list" are selected. The "Add exclusively" option must also be checked.

Action -	
	C Remove
	<ul> <li>Add exclusively</li> </ul>

Using this method you can select the remaining structures so that they are included in the analysis: for instance, an analysis with function words and adverbs and the selected additional structures. This information is entered in the Remove tab in the central panel.

Replace terms by classes: To reduce the variability of some words, it can sometimes be interesting to
include terms in categories and use those categories as terms. For instance, all mobile telephone
brands could be included in the ClassMobile category. In this way, in the process both Nokia and
Alcatel would be treated as the ClassMobile term, whose occurrences would increase. This
information is entered in the Remove tab in the central panel.



Replace terms by classes

Class definition would be included in clases.txt in the directory.

C:\Program Files\elsemantico.com\Gallito\_2.0 64Bits\palabrasClases

If you want to load that has been previously processed using class definitions, it must be specified in the Load tab. The definitions used in the clases.txt must be provided.

🔲 Load classes list

Once the parameters for corpus creation have been selected, open the Process tab and click on Start. Then the processes will be highlighted as they are executed. The total process can be slow and may even take days, depending on the options and the text corpus.

Process Rem/Add Corpus Matrix Save tab Load tab
CLEANING TEXT
ADDING OR REMOVING
COMPILING TERMS
GENERAL MATRIX
REDUCED MATRIX
READY TO QUERY
CTART
SIARI

The final process ends with the following message:

Proyecto1	X
Aviso:Matriz factorizada calculada, Listo para cor	isultas
Aceptar	
Aceptar	

Once this warning is accepted, terms and documents will be loaded on the right-hand side and it will be possible to perform operations on the semantic space.

Main menu	And the Report of the State of	
File Spaces Structures Queries Special queries Export Outputs batche	is License	
Process Rem/Add Corpus Matrix Save tab Load tab	[Al-withcare]3257=======	
	aaron razones requeria teoria esclarecedora hipnosis estado difuso	
	abandona profuso contuso teoria propuesta aun mejorada parece vaya	
	abandonados tener exto siguientes razones argumentadas naciendo	
	abandonan mtos cumle función dade pretinio quizá renombre buen	
	abandonando crédito fama influencia fascinación es mejor si simplemente	
	abandonar ignorara careciere interés iba hipnotizar si hubiera o ído hablar	
	abandonaron hipnosis lugar profusión clínica cumple función renovar	
CLEANING TEXT	abandone entusiasmo clínicos aplican técnicas están sujetas necesitan	
	abandono Innovación 2000	
	abandonos aparación entre dos mentada visemas emerición	
ADDING OR REMOVING	abancio respecto aciatica di utalenti al vigiti della especto aciatica di utale di utali di	
	abarca hiprosis prácticamente placebos trucos sentido dejaría	
	abarcan apreciar cierta convergencia desmitificación capafons	
	abarcar desenmascaramiento ensayado casos hipnosis pierde	
COMPILING TERMS	abatido solvencia mientras desmitificación resuelve ayuda adjunta	
	abaumiento lecnicas desemascaramiento disueive s figuras retorica	
	abdomen trabajo investigadose sector o informa tación del filos	
GENERAL MATRIX	abdominal sucuesto incorrectas discuten comos señas acuerdo coe	
	abdominales parece ser hay intereses política científica sostienen teorías	
	ablerta estado decir abogado si intereses política científica ceden	
	abiertas política correcta dejaría existir buena parte próspero campo	
Occurence matrix to	abiento niprosis	
	aboado	
	abogados téminos teatro apuntado tiene promisorios campos	
REDUCED MATRIX	aborda investigación líneas hipnosis perspectiva pone terapia	
	abordada relación contextos convienen lado estaría afinidad retórica	
	abordado softstica investigación conducta verbal pasando	
READY TO QUERY	abordalos sugestionanicado estanta are tramila terapia guarda teatro	
	abordamos 4157	
	abordan colegio oficial psicólogos españa ver texto página sucesivas	
	abordando datos completos profesional realizaron pruebas informe	
	abordar aparece nombre apelidos psicologo pone contacto instructor	
	abordarcinos indicarte era interción tenía tormación psicología jurídica	
	aborto dei dui rindraciones aborado de ta instrumina sentora	
	abra argumentos formalice poder ser evaluados comisión	
	abraham deontológica efectivamente dentro plazo remite plego	
START	abramson alegaciones folios perito es pues es autocalifica repte	
STAT	aorazar innumerables veces habia obrado buena voluntad elaborar	
	abre induction interest national territorio cuenta intereses nina retera Vez mala	
	abren destacar foiso resonde preductar to do index astro-	
	abreviada 💌 conteste expuesto comisión deontológica delegación colegio	
		22:24
📷 🔚 🔘 🥼 💟 😥 🚸 🏴	Es 🔺 🧭 👘	all 🍀 🌓 05/07/20
		03/07/20

#### 4.2 Operations on semantic spaces

Once a semantic space is created and loaded, operations can be performed on it.

These operations can be: comparing two terms, comparing two documents identified by a number, comparing two free texts entered by the user, extracting semantic neighbors (with simple or corrected cosines or with simple or corrected predication). The space can also be saved in a hard disc directory to be loaded at another time.

**Space properties:** In this option, the properties of the spaces on which the user is working can be viewed. Some of the indices will be disabled in the applications aimed at large linguistic corpora.

Space>Properties

Propiedades	
Size	(16317,11566)
% Accumulated singular value	Infinito
Dimensions	300
Term similarity average	0,0220553
Term Similarity SD	0,0582579
Document similarity average	0
Document similarity SD	0
Order 1 Index	0
Order 2 Index	0
Preprocess	Entrop ía

**Comparing two terms:** Two specific terms can be compared by means of their cosine or the Euclidean distance between them.

Queries > Term-Term

Term-Term	
Comparation	Measures
T2 nerviosismo	Cosines     Distances
Compare	
Results vector length 1 ,133539 vector length 2	2 1,048872
Similarity 0,3990712	

**Comparing two documents identified by a number:** Two specific documents can be compared by means of the cosine or the Euclidean distance between them.

Doc_Doc_Mem	
Document comparation Doc 1 123 Doc 2 235 Compare	measures © cosines © distance
Results Doc 1: describir programas con Doc 2: solución blemas gran pa Similarty: 0,20525618640527	structivistas sociales est rte instrucción escritura 15

Queries > Document-Document

**Comparing two freely produced texts:** Two free texts can be compared by means of their cosine or the Euclidean distance between them. (In large-size spaces this process will take a few seconds. Process progress will be shown by means of a status bar).

Queries > Free texts

Reudodocument queries				
especto aclaración mitos rácticamente placebos ti asos hipnosis pierde solv etórica teatro tercer lugar ncorrectas discuten comi ntereses política científic	documentada vigorosa exposició ucos sentido dejaría apreciar cier encia mientras desmitificación rei confusión cientí filca cumple func en señas acuerdo coe parece se a ceden política correcta dejaría	in capafons mayor honest ita convergencia desmitifi suelve ayuda adjunta técr ión dar trabajo investigad er hay intereses política ci existir buena parte próspe	idad intelectual profesional mira deja ł cación capafons desenmascaramient nicas desenmascaramiento disuelve s ores sector publican teorías discutible ent fica sostenen teorías estado dec ero campo hipnosis	nipnosis o ensaya figuras es supues ir abogad
icho cesando abogado ( ipnosis perspectiva pone asando sugestionabilida)	xcusa decir entendimiento hipno: terapia relación contextos convi l estaría aire familia terapia guard	sis términos teatro apunta enen lado estaría afinidad la teatro hipnosis tan pone	do tiene promisorios campos investiga I retórica sofística investigación cond a relieve	ación línea ucta verb
Preprocess Entrop (a		Compare	Measures Cosines	
Preprocess Entropia	Resultados	Compare	Measures Cosines C Distances	

**Extraction of semantic neighbors:** The semantic neighbors of a specific term are extracted by various methods (cosines, corrected cosines, predication, corrected predication). Neighbor trees will be displayed as term neighbors are extracted. In addition, the number of neighbors to be extracted can be selected. The results can also be exported to Microsoft Excel.

Semantic neighbors	Semantic neighbors
Term trees Term neviosismo neighbors 100	Term trees Term fobia a la sangre Measures ∩ Cosines ∩ Corrected cosines ∩ Predication ( Corrected predication
■ 1053/neviosismo         ■ 12771/artimia         ■ Activation= 0.47861507334208         Nom= 0.544072329998016         ■ 15553/refinado         ■ 7647/contracciones         ■ 15535/refinado         ■ 7647/contracciones         ■ 1553/nésisado         ■ 7653/néusea         ■ 11605/café	Image: fobia a la sangre Nom: 7.493803         Image: Image: Fill Transport         Image: Image: Fill Transport         Image: Im

# Queries > Semantic neighbors

**Extraction of the most representative terms in the semantic space:** The semantic neighbors of specific terms can be extracted by various methods.

Queries > Representation



Saving a semantic space: A semantic space can be saved in the hard disc and reloaded when necessary with no need to creating it against.

#### Save tab

Then a name and path to save 7 variables must be selected. We recommend that you save all spaces in the same directory, which can be created in the same directory browsers as each of the variables., At the end, select the format (we recommend "binary") and click on Save.

la la guila luu Santali uni	[All withoare]	2057
Process   Hem/Add   Corpus   Matrix Save tab   Load tab	aaron	razones nor un'a teoría esclamoredora binnosis estado difuso
	abandona	profuso confuso teoría propuesta au mejorada parece vava
Save project	abandonado	tener éxito siguientes razones argumentadas haciendo
	abandonados	abogado primer lugar difusión folklórica hipnosis plaga errores
	abandonan	mitos cumple función darle prestigio quizá renombre buen
Town list	abandonando	crédito fama influencia fascinación es mejor si simplemente
Termilist	abandonaron	ignorara carectere interes loa niprotizar si nubiera o loo nabiar
	abandone	entusiasmo clínicos anician técnicos están sujetas necestan
	abandono	innovación
Doc list	abandonó	3258
	abandonos	respecto aclaración mitos documentada vigorosa exposición
	abanico	capafons mayor honestidad intelectual profesional mira deja
Doc matrix	abarcan	Improvis practicamente placebos trucos sentido dejaria
	abarcar	desember a convergencia desimilitación capatóns
	abatido	solvencia mentali demitificación resultiva vulca adunta
i erm matrix	abatimiento	técnicas desenmascaramiento disuelve s figuras retórica
	abc	teatro tercer lugar confusión científica cumple función dar
	abdomen	trabajo investigadores sector publican teorías discutibles
Global weight	abdominal	supuesto incorrectas discuten comgen senas acuerdo coe
	abierta	partede ser nay intereses política científica sostienen teorías
	abiertas	política comercia deiaría existir buena parte prísero campo
Diagonal matrix	abierto	hipnosis
	abiertos	=======================================
	abogado	dicho cesando abogado excusa decir entendimiento hipnosis
Space features	abogados	términos teatro apuntado tiene promisorios campos
	abordada	investigación líneas niphosis perspectiva pone terapia relación contextos convienen lado estaría afinidad retórica
	abordado	sofistica investigación conducta verbal pasado
	abordados	sugestionabilidad estaría aire familia terapia guarda teatro
	abordaje	hipnosis tan pone relieve
Mada	abordamos	=======================================
modo	abordan	colegio oficial psicologos españa ver texto página sucesivas
Binary Save	abordar	datos compietos profesional realizaron pruebas informe
	abordaremos	aparece indicate precisions pactorized provide contracto instruction
C Serialized	aborden	suficiente trataba compromiso indirecto tenía familiar señora c
	aborto	dejó guiar indicaciones abogado ésta instructor indica
	abra	argumentos formalice poder ser evaluados comisión
Construction to the sector of	abraman	deontològica etectivamente dentro plazo remite plego
3 Save project automatically	abrazar	alegaciones toilos perito es pues es autocarrica repte
	abrazos	informes babía terido cuenta interese niña evez mala
	abre	redacción informe ha llevado interpretaciones erróneas éste
	abren	destacar folios responde preguntas instructor propone
	abreviada	Iconteste expuesto comisión deontológica delegación colegio

Loading a semantic space. In the same way, a semantic space can be loaded from the hard disc with no need to create it again.

#### Load Tab

A name and route to locate the 7 variables of the space to be loaded must be selected. In the same directory browser as each of the variables, you can browse and select the path for the relevant variable. At the end, select the format in which the space was saved (we recommend "binary").



After this, click Load and wait for the following message:



Select Accept and the space will be loaded in the memory to perform the operations described above.

#### 4.3 Batch processing

Actions can be performed by batches, specifying in a file the terms and characteristics of the operations to be performed.

#### 4.3.1 Neighbor batches

The first n semantic neighbors will be extracted from a number of terms. In the expandable menu, the following screen will appear, where the number of neighbors, the directory where the file specifying the terms, and the file itself are specified.

#### The file will have the following format

match football note

The same process will generate a file per term, specifying the neighbor, cosine, and vector length

Deighbor batches	
Neighbors 30 🛨	
Directory C:\Users\guille\Documents	
Term list (in the same directory)	
list.txt Generate	

#### 4.3.2 Similarity matrices

A matrix will be extracted to compare the neighbors with each other. This square matrix has ones in its diagonal and each cell represents the cosine of two neighbors. The directory for the reference file and the file name itself will be specified. Similarity matrices will be generated in that same directory.

The file format is the following:

match|200 football|300 note|300

Where a 200x200 will be extracted in the first case, 300x300 in the second one, etc.

D Similarity matrices	
Directory	
C:\Users\guille	
File	
sim.txt	
Entrant	1
Extract	]

#### 4.3.3 Similarity between pairs

This will generate the similarities between a number of term pairs. The directory for the reference file and name of the file itself will be specified.

The file format will be the following:

tremendous|action dog|cat share|stock

Similarity between pairs	
Directory C:\Users\guille Term list (in the same directory) list.txt	Similarity Cosines Distances
Compare	

### 4.4 Standard output

### 4.4.1 Matrices to plain text files

The Export drop menu includes the option "Matrices to .txt". Just enter the directory in which you wish to generate the files, which will be the US, SV, and S matrices, as well as the weights assigned by the calculations to each word (log-entropy or log-idf) and the vector length for each term.

Matrices to txt
Save Directory
C:\Users\guille
Generate

### 4.4.1 Term to Pajek file

For visualization purposes, there is a Term to Pajek option in the Export drop menu. From this process a file is extracted that will serve as input for the Pajek program to generate visualization networks.

Y Term to Pajek
Term fobia Directory C:\Users\quille
Generate

Pajek is available at http://vlado.fmf.uni-lj.si/pub/networks/pajek/ and can be downloaded for free. This output will use cosines as similarity and vector length as node size. By entering the input, graphs such as the one below can be obtained.

