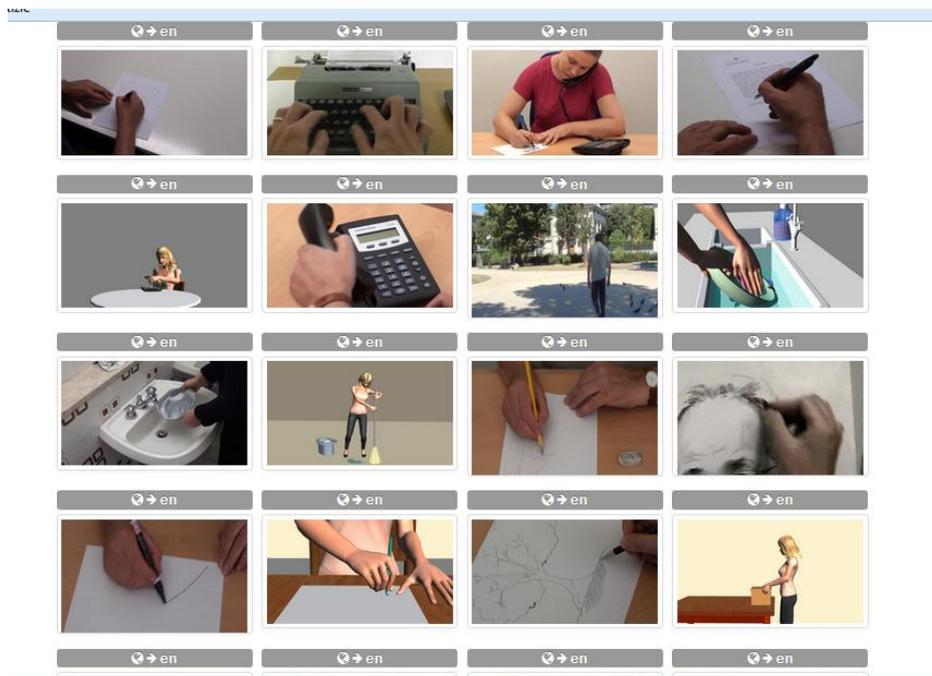
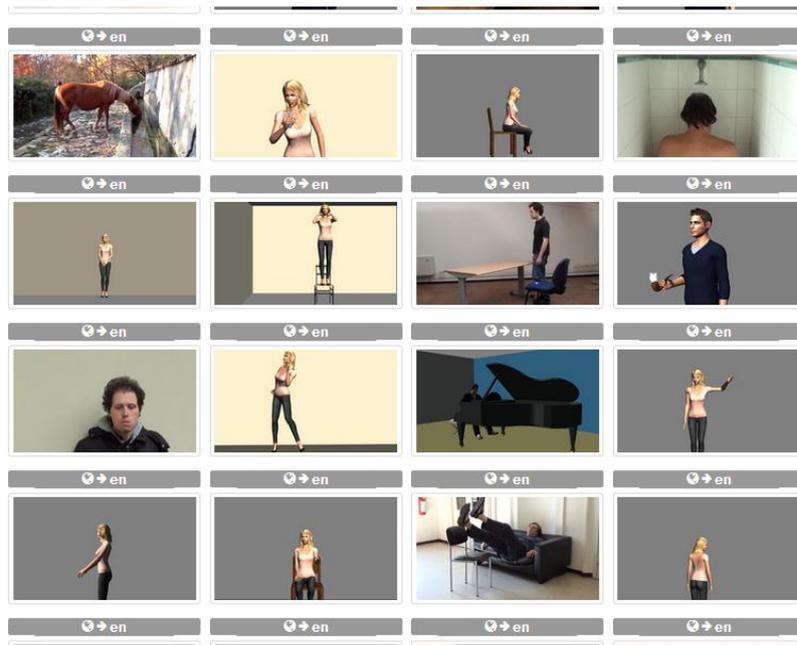


IMAGACT4ALL - USERGUIDE

Competence-based extension of the IMAGACT Ontology

Premises

IMAGACT provides a representation of the actions that are most prominent in everyday life using prototypic 3D animations or brief films. There are 1017 of these action types in the IMAGACT first release.



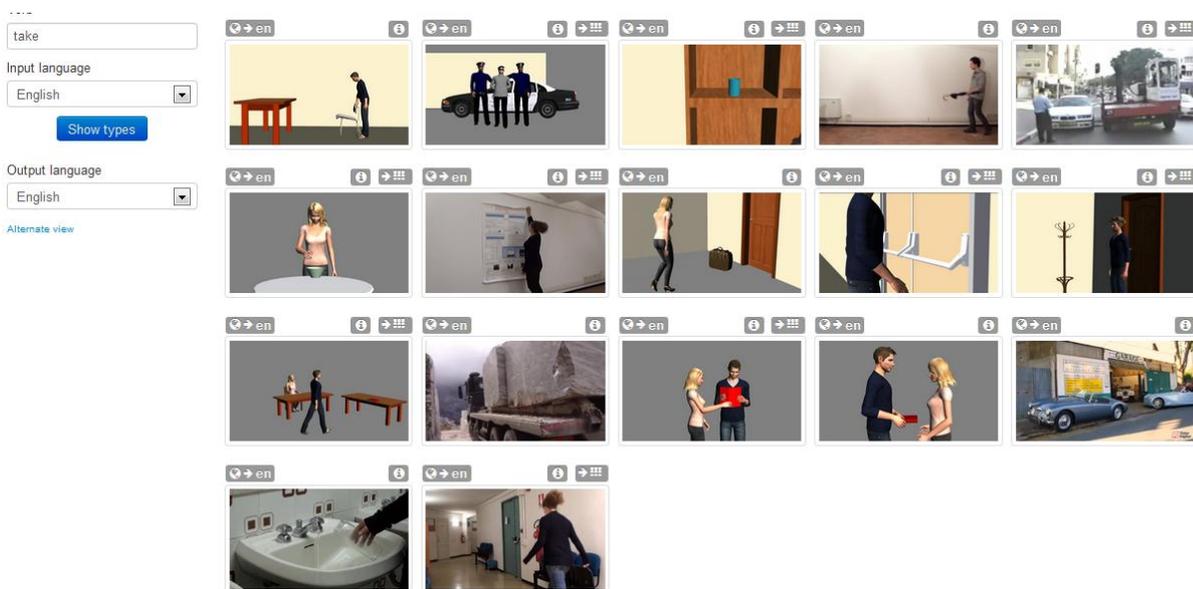
This universe of actions has been identified through the annotation of English and Italian spontaneous speech corpora. These corpora comprise speech from real pragmatic contexts, which offer a good representation of how we refer to common activities.

Actions that are more frequently referred to in everyday life are also those concepts that have more relevance for linguistic communication. It is very important for communication to know the verbs that identify those actions. From the following url you can download the list of English verbs considered so far. It includes around 600 high-frequency verbs referring to physical actions.

http://62.48.36.230/Lablita/projects/IMAGACT/folder.2010-11-25.7365875310/folder.2013-10-30.4306418381/EN-4-mapped_verbs.xls

These verbs and their Italian counterparts have been processed, and the range of their possible extensions to actions have been identified and represented in a unique set of filmed prototypes.

For each of the more common action verbs of English and Italian, we have made explicit the set of actions it can refer to. For instance, this is the set of actions that can be referenced by the verb *to take*.



Metaphor and idioms have been avoided, and only the interpretations of verbs in their proper meaning have been considered. For instance, *take time* and *take care* have been discarded and only the usages that represent the productive meaning of the verb are considered.

By comparing the variation of verbs within and across languages it is now possible to observe how verbs of different languages categorize the universe of action.

For instance, the difference between the English verb *to take* and the corresponding Italian verb *prendere* has been made explicit.

take ←	take = prendere	prendere ←
 <p data-bbox="268 371 464 389">John takes the chair over to the table</p>	 <p data-bbox="687 371 868 389">John takes the cup from the shelf</p>	 <p data-bbox="1094 371 1291 389">Fabio prende Marta per un braccio</p>
 <p data-bbox="268 551 464 568">The police take the prisoner with them</p>	 <p data-bbox="687 551 868 568">John takes the ball off the floor</p>	 <p data-bbox="1094 551 1291 568">Fabio prende il coniglio con la trappola</p>
 <p data-bbox="268 730 464 748">John takes the blind man across the street</p>	 <p data-bbox="687 730 868 748">Mary takes the book from the table</p>	 <p data-bbox="1094 730 1291 748">Marta prende la farfalla con il retino</p>
		

Prendere cannot be used in actions in which *take* is equivalent to *bring* and *lead*, whereas *take* cannot be extended to the actions in which *prendere* is equivalent to *acchiappare* (*catch*)

This information cannot be derived from bilingual dictionaries but is a direct consequence of mapping English and Italian verbs onto one ontology of action.

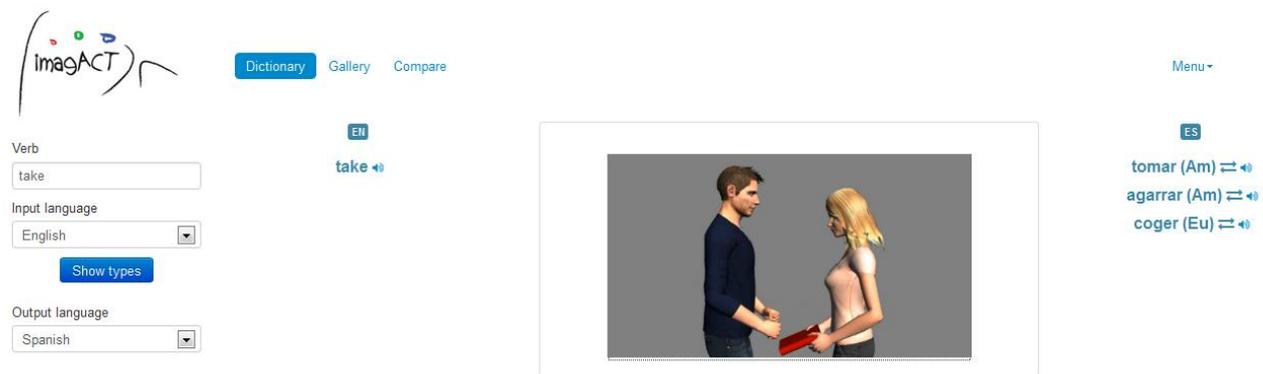
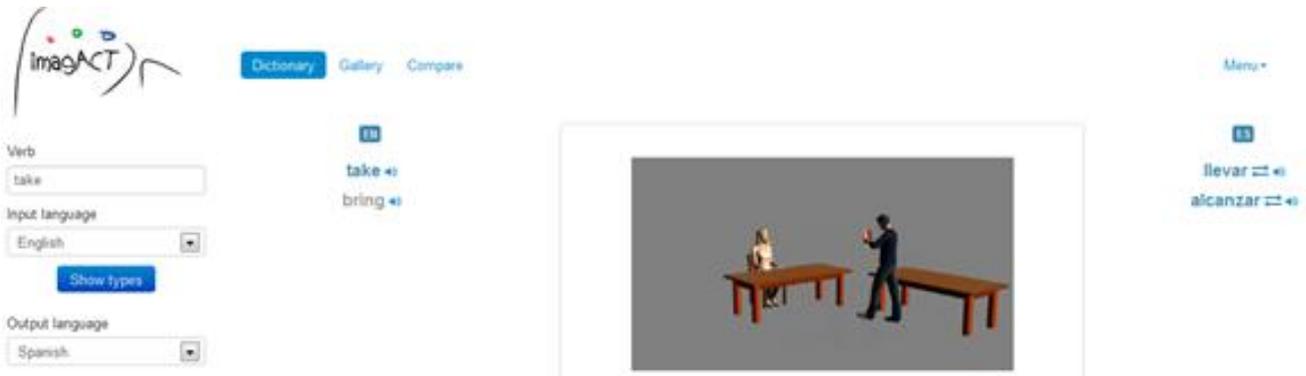
The Query interface is available from <http://www.imagact.it/imagact/query/dictionary.seam>

Project and Documentation in <http://imagact.lablita.it/index.php?lang=en>

Competence-based extension

The universal language of images, which we have used to represent action types, allows us to connect verbs from any language to their appropriate action without passing through verbal definitions of the action concepts.

The scenes in IMAGACT are very explicit and leave little space for ambiguity. For instance, a Spanish informant can easily decide which verb or verbs of his language can be used for each action.



The relation between Spanish verbs and the verbs of the other languages in IMAGACT is therefore obtained without passing through a translation process, since it is the direct consequence of mapping Spanish verbs onto the set of scenes in the database.

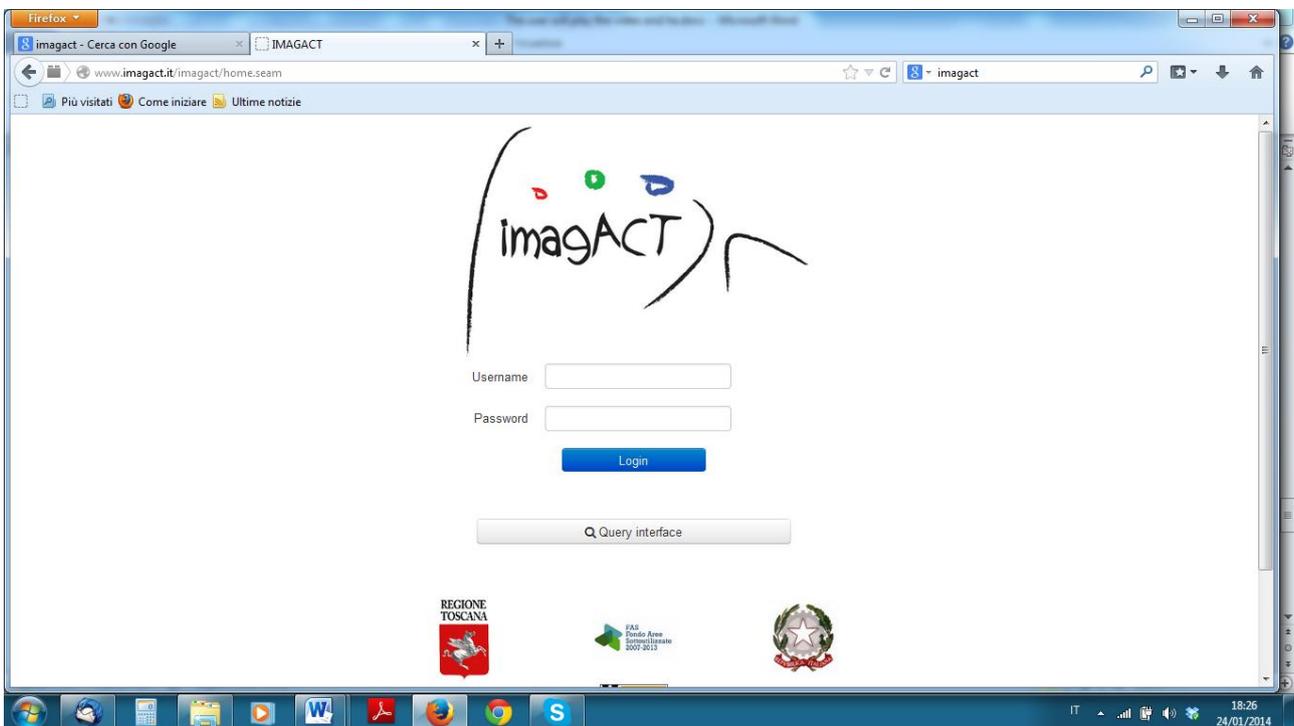
We have created an infrastructure with a clear user interface, called IMAGACT4ALL, that has already been successfully used to incorporate Spanish and Chinese into IMAGACT. The following sections present the implementation procedure for mapping any language onto the IMAGACT ontology using this interface.

Logging in to IMAGACT and accessing the Competence-Based Extension Interface

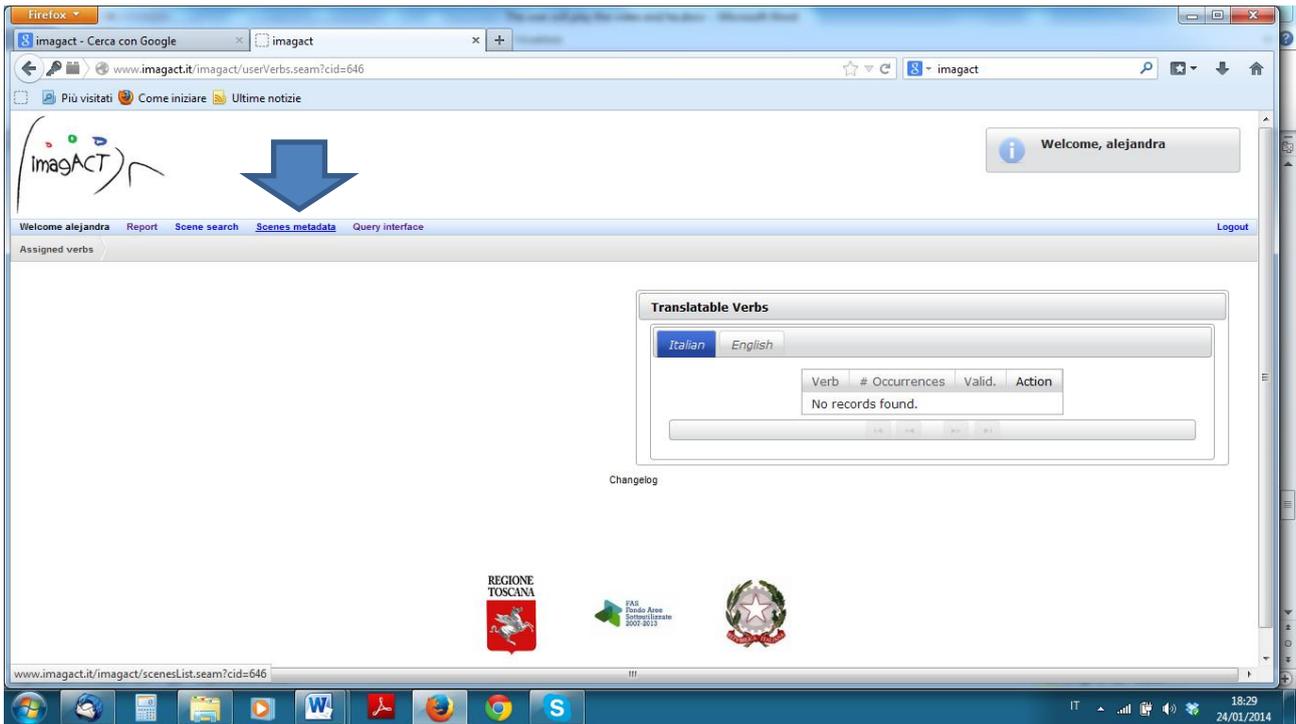
The work of competence-based extension of IMAGACT to a new language is performed by native-speaker informants. These informants receive a username and password that authorize them to process data for their language only.

More than one informant can work simultaneously; however, the infrastructure in this release does not provide an explicit comparison of their work or an interface for collaboration in the case of conflicts.

The informant will log in and will have access to the part of the IMAGACT infrastructure which is dedicated to competence-based extension. In principle, any browser should be compatible with the infrastructure, but we strongly advise the use of Firefox or Chrome, which have been thoroughly tested.



We are now accessing as a Spanish or Chinese informant. After logging in, the informant will choose the “scene metadata” menu.



The informant will be redirected to the competence-based extension interface, which presents the IDs and thumbnail images of all the scenes, each identifying one separate action concept in the ontology (10 scenes are listed on each page).

On the right side of each scene the informant will see the English and Italian verbs mapped onto that scene in the corpus-based annotation. Moreover, he will see the processing status of each scene in all languages that have been opened for processing IMAGACT concepts in IMAGACT4ALL.

ID	Video	Related verbs	Status	chinese	danish	english	spanish Am	spanish Eu	hindi	italian	polish	portuguese Br	portuguese Ep
a1d9df5e		Verb Type Lang aspettare PRC IT aspiagare PRC IT attaccare PRC IT collocare INET IT evincere INET IT colpire INET IT mettere INET IT muovere INET IT piangere INET IT put INET IT set INET IT spostare INET IT		✓	✓	✗	✓	✓	✗	✗	✓	✗	
6fc1f1be0		Verb Type Lang aspettare PRC IT hang PRC IT attaccare INET IT mettere INET IT put INET IT		✓	✓	✗	✓	✓	✗	✗	✓	✗	
fa92bcb6		Verb Type Lang aspettare PRC IT iby PRC IT lean PRC IT prode PRC IT stare PRC IT collocare INET IT mettere INET IT piangere INET IT put INET IT set INET IT		✓	✓	✗	✓	✓	✗	✓	✓	✗	

In order to start processing, the informant will click on the ID and access the full set of metadata for that concept.

Welcome alejandra Report Scene search Scenes metadata Query interface

Assigned verbs Scenes list Scenes metadata

ID: 0c26587c



Classes

- Change of location
- Setting relation among objects

Work Done:

spanish - Am

Save

Save and back to list

Corpus verbs	Type	Lang.	Caption
appendere	PRO		Marta appende la lampada alla catena
hang	PRO		Mary hangs the light on the chain
sospendere	PRO		Marta sospende la lampada alla catena
suspend	PRO		Mary suspends the light on the chain
attaccare	INST		Marta attacca la lampada alla catena
mettere	INST		Marta mette la lampada in salotto
put	INST		Mary puts the light on the chain

Assigned verbs					
Verb	Transliteration	Rejected	Lang.	Caption	Transliterated caption
essere appeso		<input checked="" type="checkbox"/>			
penzolare		<input checked="" type="checkbox"/>			
挂	guà	<input type="checkbox"/>		李娜把灯挂在链子上	lǐ nà bǎ dēng guà zài liàn zǐ shàng
吊	diào	<input type="checkbox"/>		李娜把灯吊在链子上	lǐ nà bǎ dēng diào zài liàn zǐ shàng
放	fàng	<input checked="" type="checkbox"/>			
to attach		<input checked="" type="checkbox"/>			
henge		<input checked="" type="checkbox"/>			
hekte		<input checked="" type="checkbox"/>			
appende		<input checked="" type="checkbox"/>			

Competence based verbs						
Verb	Transliteration	Lang.	Caption	Transliterated caption	es - Am	es - E
colgar			Marta cuelga la lámpara a la cadena		<input type="checkbox"/>	<input type="checkbox"/>

The informant cannot modify the information on this page that concerns other languages. Only the lines corresponding to his language can be edited. The language for each line is identified by a flag.

The first necessary operation is to properly appreciate the action represented in the video. The informant will play the video by clicking on it and will observe the represented action. It is clearer and more informative to play it full screen.



Once he understands the referred action, the informant will provide the verb or verbs in his language that can be used to refer to that specific action. The lemma should be annotated in its infinitival form, as it is commonly reported in dictionaries.

The informant will annotate this lemma (or lemmas) in the box corresponding to his language - on the bottom of the page. As an example, this is the lemma chosen by the Spanish informant for this action.

Competence based verbs				
Verb	Transliteration	Lang.	Caption	Transliterated caption
colgar			Marta cuelga la lámpara a la cadena	

For each lemma he will then write in the “caption box” a simple sentence in the present tense filling all the arguments of the verb that properly describe the action. This sentence will be used as the caption of the scene in the language of the informant.

Both the verb and the caption must be written in the current writing system of the language of the informant.

If this system does not use roman characters, after the annotation in the current writing system, the informant will also provide the verb and its caption in roman characters.

He or she will write it in the respective transliteration boxes, as in this Chinese example.

Verb	Transliteration	Rejected	Lang.	Caption	Transliterated caption
挂	guà	<input type="checkbox"/>		李娜把灯挂在链子上	lǐ nà bǎ dēng guà zài liàn zǐ shàng
吊	diào	<input type="checkbox"/>		李娜把灯吊在链子上	lǐ nà bǎ dēng diào zài liàn zǐ shàng

Saving and editing the work

For each scene, once the work on verbs and captions is completed, the informant ticks the box corresponding to “work done”. To return to the list of scenes to be processed, the informant then clicks on the link “save and back to list”. The box and link are located on the left side of the screen.

ID: 0c26587c



Classes

- Setting relation among objects
- Change of location

Work Done:

spanish - Am

Save

Save and back to list

Corpus verbs	Type	Lang.	Caption
appendere	PRO	IT	Marta appende la lampada alla catena
hang	PRO	EN	Mary hangs the light on the chain
sospendere	PRO	IT	Marta sospende la lampada alla catena
suspend	PRO	EN	Mary suspends the light on the chain
attaccare	INST	IT	Marta attacca la lampada alla catena
mettere	INST	IT	Marta mette la lampada in salotto
put	INST	EN	Mary puts the light on the chain

Competence based verbs				
Verb	Transliteration	Lang.	Caption	Action
colgar		ES	Marta cuelga la lámpara a la cadena	
pener		ES	Marta cuelga la lámpara a la cadena	X
		ES		+

The infrastructure does not allow any editing of verbal lemmas, captions, or transliterations after a new line is inserted or the work is saved.

If the informant needs to modify something or she changes her judgment on the applicability of the verb, she must delete the entire line (using the red x on the right). She may then write it again in the correct manner, if needed.

For instance, in the figure shown, the applicability of the last verb is highly doubtful in Spanish and, moreover, a typing error occurred (*pener* instead of *poner*).

Therefore, the Informant will delete the line by clicking on the x. If she wants, she can write it again in a corrected manner on a new line.

ID: 0c26587c



Classes

- Setting relation among objects
- Change of location

Work Done:

spanish - Am

Save

Save and back to list

Corpus verbs	Type	Lang.	Caption
appendere	PRO	IT	Marta appende la lampada alla catena
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Competence based verbs				
Verb	Transliteration	Lang.	Caption	Action
colgar		ES	Marta cuelga la lámpara a la cadena	
		ES		+

She will then save and go back to the list of scenes.

Continuing the work

After clicking 'save and back to list', the Infrastructure will take the informant to the first page of the list.

The screenshot shows the 'scenesList.seam?cid=822' page in the imagact application. It features a search bar with 'Results: 1010' and a table of scene entries. The table has columns for ID, Video, Related verbs, Status, and various languages. Two entries are visible:

ID	Video	Related verbs	Status	chinese	danish	english	spanish Am	spanish Eu	hindi	italian	polish	portuguese Bp	portuguese Ep
a1d9df5e		Vvrb Type Lang. accossare PRO IT appoggiare PRO IT attaccare PRO IT accostare INST IT avvicinare INST IT collocare INST IT mettere INST IT move INST GB place INST GB put INST GB set INST GB spostare INST IT	✓	✓	✗	✓	✓	✓	✗	✓	✗	✗	
6fc11be0		Vvrb Type Lang. appendere PRO IT hang PRO GB attaccare INST IT mettere INST IT put INST GB	✓	✓	✗	✓	✓	✓	✗	✓	✗	✗	

To continue working, the annotator will ask the infrastructure to give to him the scenes which remain to be processed. The easiest way to do this is to select the language and then click on the search button .

The screenshot shows the search interface with the 'Search' button highlighted by a blue arrow. The 'Results: 1010' indicator is also highlighted. The table below shows the same scene entries as in the previous screenshot, but with a different set of related verbs:

ID	Video	Related verbs	Status	chinese	danish	english	spanish Am	spanish Eu	hindi	italian	polish	portuguese Bp	portuguese Ep
a1d9df5e		Verb Type Lang. addressare PRO IT appoggiare PRO IT attaccare PRO IT accostare INST IT avvicinare INST IT collocare INST IT mettere INST IT move INST GB place INST GB put INST GB set INST GB spostare INST IT	✓	✓	✗	✓	✓	✓	✗	✓	✗	✓	
6fc11be0		Verb Type Lang. appendere PRO IT hang PRO GB attaccare INST IT mettere INST IT put INST GB	✓	✓	✗	✓	✓	✓	✗	✓	✗	✓	

For instance, when the box for Chinese is ticked, the infrastructure will immediately return the scenes that are still to be processed for this language.

The screenshot shows the IMAGACT web interface. At the top, there is a search bar with 'ID' and 'Related verb' fields. Below that, there are checkboxes for metadata (cn, dk, en, es-Am, es-Eu, in, it, pl, pt-Bp, pt-Ep) and a 'Search' button. The search results are displayed in a table with 8 results. The table has columns for ID, Video, Related verbs, Status, and various languages (chinese, danish, english, spanish Am, spanish Eu, hindi, italian, polish, portuguese Bp, portuguese Ep). Two rows are visible, each with a video thumbnail and a list of verbs with their types and languages. The 'chinese' column is checked for both rows.

ID	Video	Related verbs	Status	chinese	danish	english	spanish Am	spanish Eu	hindi	italian	polish	portuguese Bp	portuguese Ep																																				
f4268c0a		<table border="1"> <thead> <tr> <th>Verb</th> <th>Type</th> <th>Lang.</th> </tr> </thead> <tbody> <tr><td>hang</td><td>PRO</td><td>EN</td></tr> <tr><td>rest</td><td>PRO</td><td>EN</td></tr> <tr><td>appoggiare</td><td>INST</td><td>IT</td></tr> <tr><td>collocare</td><td>INST</td><td>IT</td></tr> <tr><td>lay</td><td>INST</td><td>EN</td></tr> <tr><td>mettere</td><td>INST</td><td>IT</td></tr> <tr><td>place</td><td>INST</td><td>EN</td></tr> <tr><td>poggiare</td><td>INST</td><td>IT</td></tr> <tr><td>posare</td><td>INST</td><td>IT</td></tr> <tr><td>put</td><td>INST</td><td>EN</td></tr> <tr><td>set</td><td>INST</td><td>EN</td></tr> </tbody> </table>	Verb	Type	Lang.	hang	PRO	EN	rest	PRO	EN	appoggiare	INST	IT	collocare	INST	IT	lay	INST	EN	mettere	INST	IT	place	INST	EN	poggiare	INST	IT	posare	INST	IT	put	INST	EN	set	INST	EN		✓	✗	✗	✓	✓	✓	✗	✓	✓	✗
Verb	Type	Lang.																																															
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put	INST	EN																																															
set	INST	EN																																															
d85fc4c7		<table border="1"> <thead> <tr> <th>Verb</th> <th>Type</th> <th>Lang.</th> </tr> </thead> <tbody> <tr><td>roll up</td><td>PRO</td><td>EN</td></tr> <tr><td>avvolgere</td><td>INST</td><td>IT</td></tr> <tr><td>enclose</td><td>INST</td><td>EN</td></tr> <tr><td>surround</td><td>INST</td><td>EN</td></tr> <tr><td>wrap</td><td>INST</td><td>EN</td></tr> <tr><td>wrap up</td><td>INST</td><td>EN</td></tr> </tbody> </table>	Verb	Type	Lang.	roll up	PRO	EN	avvolgere	INST	IT	enclose	INST	EN	surround	INST	EN	wrap	INST	EN	wrap up	INST	EN		✓	✗	✗	✓	✓	✓	✗	✓	✗	✗															
Verb	Type	Lang.																																															
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wrap	INST	EN																																															
wrap up	INST	EN																																															

Sharing the work

There may be more than one annotator at time working on one language; however, the infrastructure does not allow, at least in this release, collaborative work or evaluation for consensus on the possible verb assignments by different annotators.

In IMAGACT we foresee that the work on one language will be under the responsibility of one supervisor, who will revise the choices once the annotation has been completed by one or more native-speaker informants.

The supervisor can track his revisions on one Excel file for scientific purposes.

The work on one language is made accessible on the IMAGACT query interface once the supervisor gives his OK.

A supervisor of informants in a particular language is called a SuperCBE.

Users with a SuperCBE role will be able to assign for processing a set of videos in IMAGACT to their informants. The procedure is as follows:

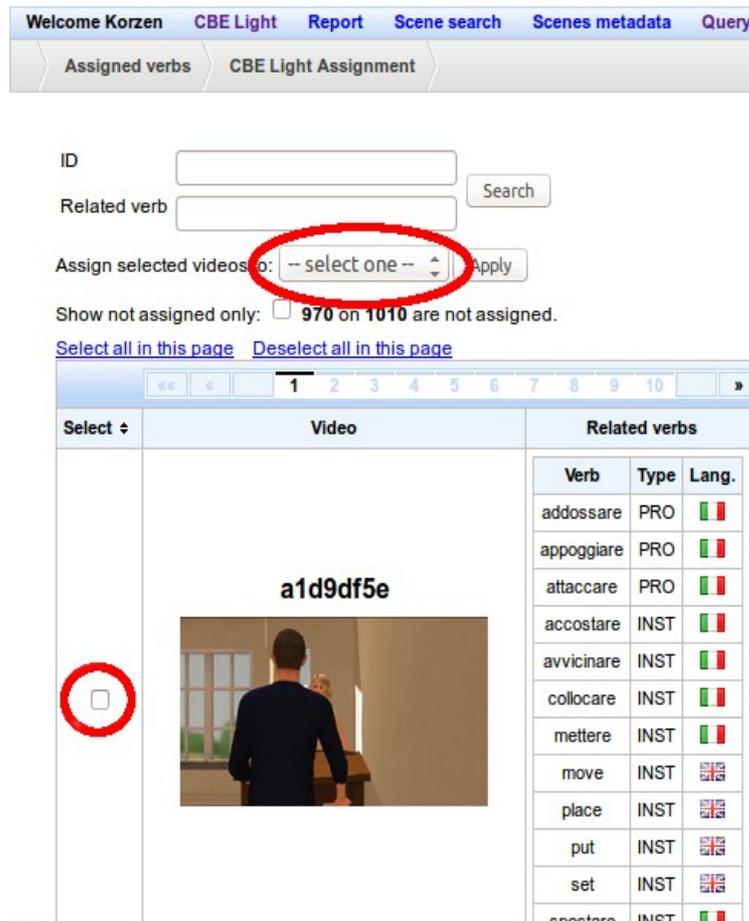
'CBE Light' in the navigation bar lists all the scenes in IMAGACT.

Every video has a selection box on its left.



A dropdown menu lists all CBE informants for the SuperCBE's language. After selecting videos, the SuperCBE selects the CBE user and clicks on the 'Apply' button.

The SuperCBE can select pages after pages. CBE users will see and process only videos assigned to them.



Requirements for the annotation

Choice of verb

When the informant assigns a verb to one action type, this verb should identify the action *in its proper meaning*; no metaphorical sense or idiomatic usage is allowed.

The informant is not requested to specify which verb is the best to express the action, which is the most precise, or which is the most probable lemma to be used for that action.

The task is not defining the action, but only finding the verbs of the language that in principle could be used to refer to that action.

For instance, the verb *to put* is not the most probable and does not define the action below, but, in accordance with the semantic competence of native-speaker informants, it can be applied to this action and is therefore one of the verbs to be annotated.

6fc11be0



Corpus verbs	Type	Lang.	Caption
appendere	PRO		Fabio appende il cappello all'attaccapanni
hang	PRO		John hangs the hat on the hook
attaccare	INST		Fabio attacca il cappello all'attaccapanni
mettere	INST		Fabio mette il cappello all'attaccapanni
put	INST		John puts a hat on the hook

Ambiguity

Although the scenes in IMAGACT have been scripted and filmed in order to be as unambiguous as possible and to convey one sole meaning, some ambiguity is still possible and can lead to misunderstanding or over-interpretation by the Informant.

To avoid this risk, the Informant must reach a clear understanding of the specific action that we want to represent in each occasion.

For instance, in this case, the informant could say that the represented action is not only *to lead*, but also *to help* or *to cross*.

Output language

English

EN

lead ↔
take ↔
bring ↔
conduct ↔
guide ↔



John leads the blind man across the street

EN

take ⇄
bring ⇄
conduct ⇄
lead ⇄
guide ⇄

Beyond *taking* and *bringing* we could also say that an act of *giving* occurred (*dar* in Spanish)



However, these alternative categorizations fall outside the domain of IMAGACT.

The informant should identify the specific physical action that is intended in the film (For example, *to help* is not a physical action).

Moreover, to identify the action, one needs to distinguish it from its consequences. For instance, *crossing* and *giving* are consequences of *bringing*, *taking* and *leading* and are beyond what is intended by this video.

The possible alternatives must always be verbs that identify the physical action in a *simultaneous* manner (*giving* is not simultaneous to *bringing*).

This level ambiguity can sometimes be found among the IMAGACT scenes, and the scenes should be evaluated to arrive at the appropriate interpretation for the goals of IMAGACT.

Suggested verbs and the preferred language of the Informant

In order to provide reliable competence-based judgments, the Informant must be a native speaker of the language she is implementing .

In the case of languages that cannot be acquired in the natural process of language acquisition (for example, Latin, Sanskrit, or Classic Arabic) she must be an expert and frequent user of this language, ensuring a full appreciation of the possible uses of the action-oriented lexicon.

In order to exploit the suggestions for alternatives provided by the annotation, she must also know (at least at a very basic level) English or one of the languages already implemented in IMAGACT (Italian, Spanish, or Chinese). This is necessary for the following reason:

As far as one verb can refer to more than one action, one action can also be identified by more than one verb. More specifically, two verbs with different meanings can identify the same action. For instance, in English the following action can be equivalently identified with *to take* or *to bring*.

This is true also in Spanish, which equivalently picks up this action will the verbs *llevar* and *alcanzar*

This is one of the more relevant properties of the linguistic identification of actions and the informant must be well aware of it.

Therefore, the informant is not requested to annotate only one verb fitting with the represented action, but is invited to find more than one sole possible option allowed by his language.

However, the viewing of one film may be not sufficient to elicit all alternatives. The Informant is not requested to provide the complete range of possible verbs in his language that can refer to that action, but only to consider this possibility. It is not a problem if no alternative comes to mind.

However the infrastructure provides one simple means to stimulate the thinking of the informant.

Frequently, in the corpus-based annotation, more verbs have already been found in English and Italian that can fit with the represented scene. Moreover, in the previous Competence Based extensions, other alternatives in many languages have been provided. These alternatives should function as suggestions for figuring out alternatives in the language of the Informant. This opportunity should be exploited in a systematic manner during the workflow after the first option has been determined.

6fc11be0



Corpus verbs	Type	Lang.	Caption
appendere	PRO	IT	Fabio appende il cappello all'attaccapanni
hang	PRO	EN	John hangs the hat on the hook
attaccare	INST	IT	Fabio attacca il cappello all'attaccapanni
mettere	INST	IT	Fabio mette il cappello all'attaccapanni
put	INST	EN	John puts a hat on the hook

Competence based verbs			
Verb	Transliteration	Lang.	Caption
meter		ES	Fabio mete el sombrero en el perchero
colgar		ES	Fabio cuelga el sombrero en el perchero
poner		ES	Fabio pone el sombrero en el perchero

For instance, the first verb which came to the mind to the Spanish annotator for this action was the verb *colgar* (*hang*). However, looking at the English annotation, he could see that this event can be also identified by the verb *to put* in English.

So, the Spanish informant could figure out that also in Spanish other verbs that are similar to *put* can be properly applied (*meter, poner*).

The annotator is only requested to judge whether or not the alternatives suggested by other languages can in principle be accepted and used in referring to the event into question.

In this case, he will report a new verbal lemma and a new caption, by adding a line to his language options (He does this by clicking on the green plus button on the right).

As a consequence of this workflow requirement, the Informant must be able to appreciate at least some of the lexical choices provided by previous work; that is, he must know some English or at least one of the other implemented languages.

It is not necessary that the informant consider the full set of language information. This could cause a lot of confusion and would be very time consuming.

In order to deal properly with the competence-based extension task, the suggested information should come from one or at maximum two languages, which the informant should choose beforehand according to his preference.

A “hide languages” function will be implemented soon in order to reduce the amount of information shown on the web page.

Proper Names

When writing the caption, if the Actor is a male or female person, he or she will be always identified with a proper name .

The informant should choose one sole typical male or female name in his country (For instance, Marta and Fabio are used for Italian and Spanish). These proper names should not be changed all through the set of represented actions and should be chosen in a way that they are easy to write.