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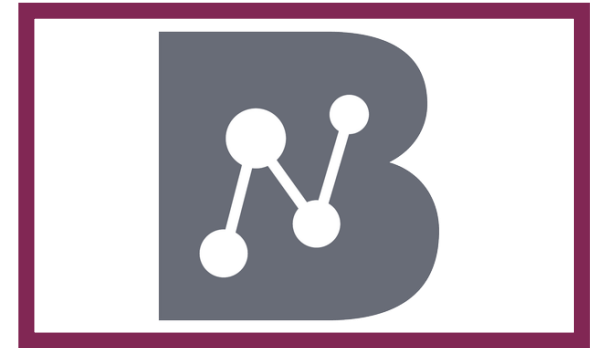
Enriching BabelNet verbal entities with videos

A linking experiment with the IMAGACT Ontology of Action

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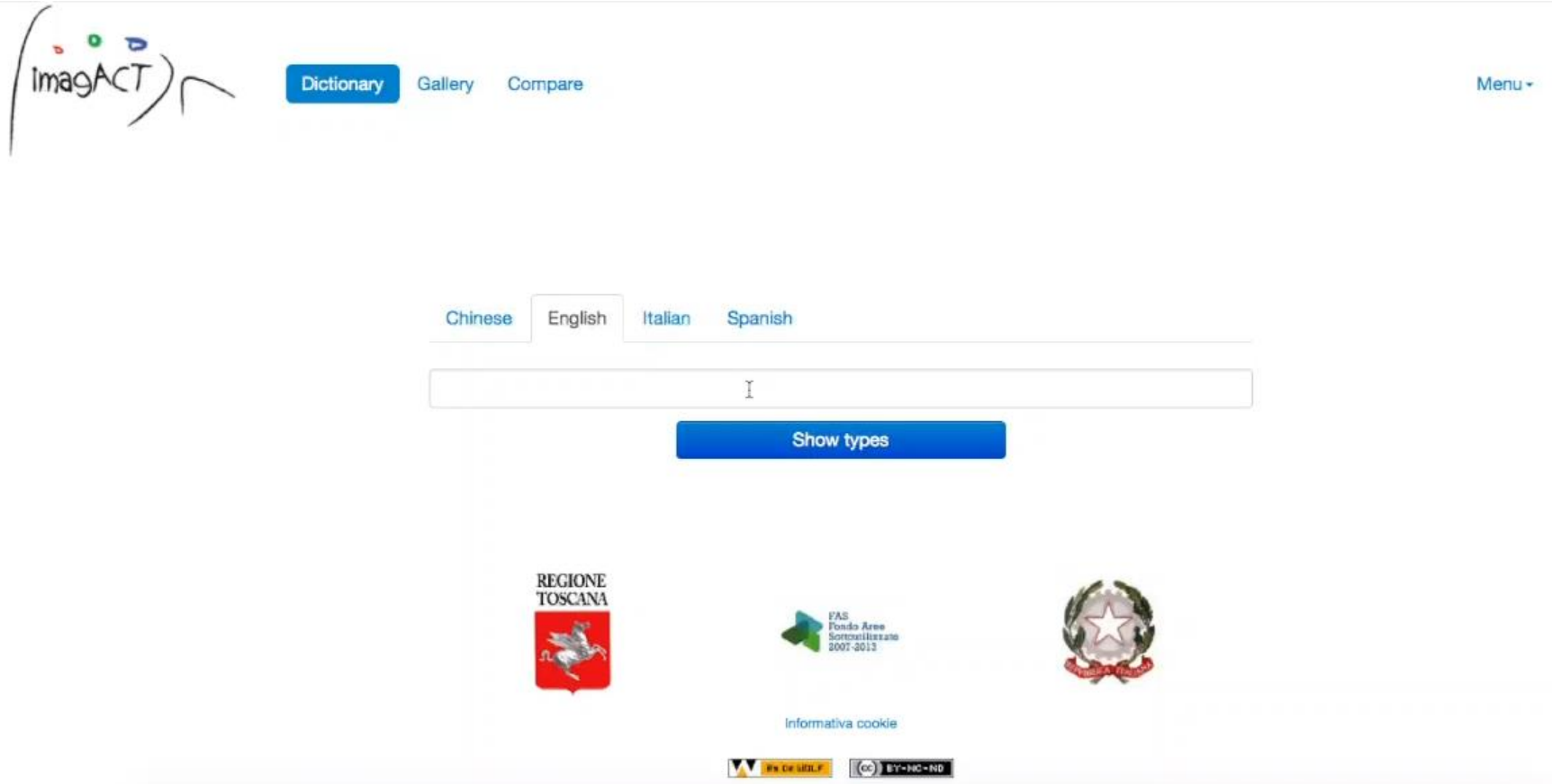
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A linking experiment with the IMAGACT Ontology of Action

IMAGACT: the Ontology of Actions

<http://www.imagact.it>

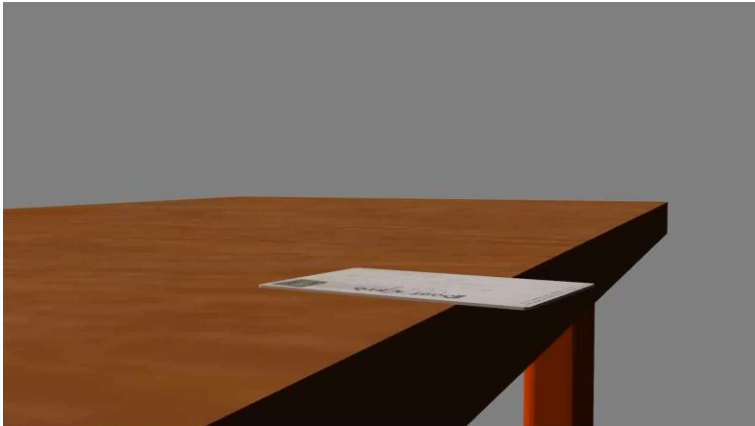


Dictionary interface example

IMAGACT: the Ontology of Actions



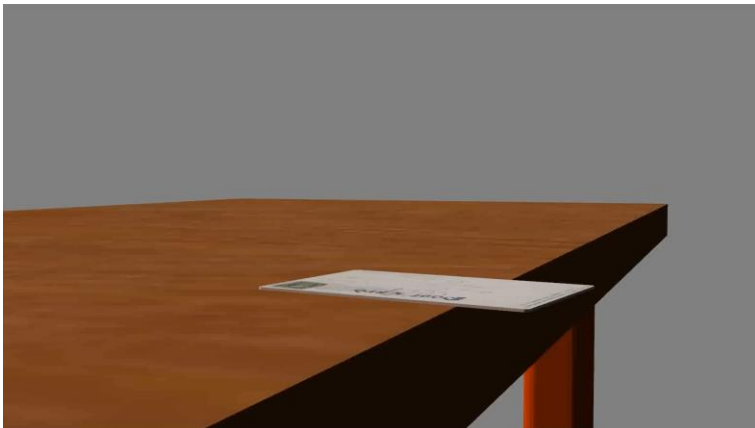
EN: The bus turns into Parliament Square



IMAGACT: the Ontology of Actions

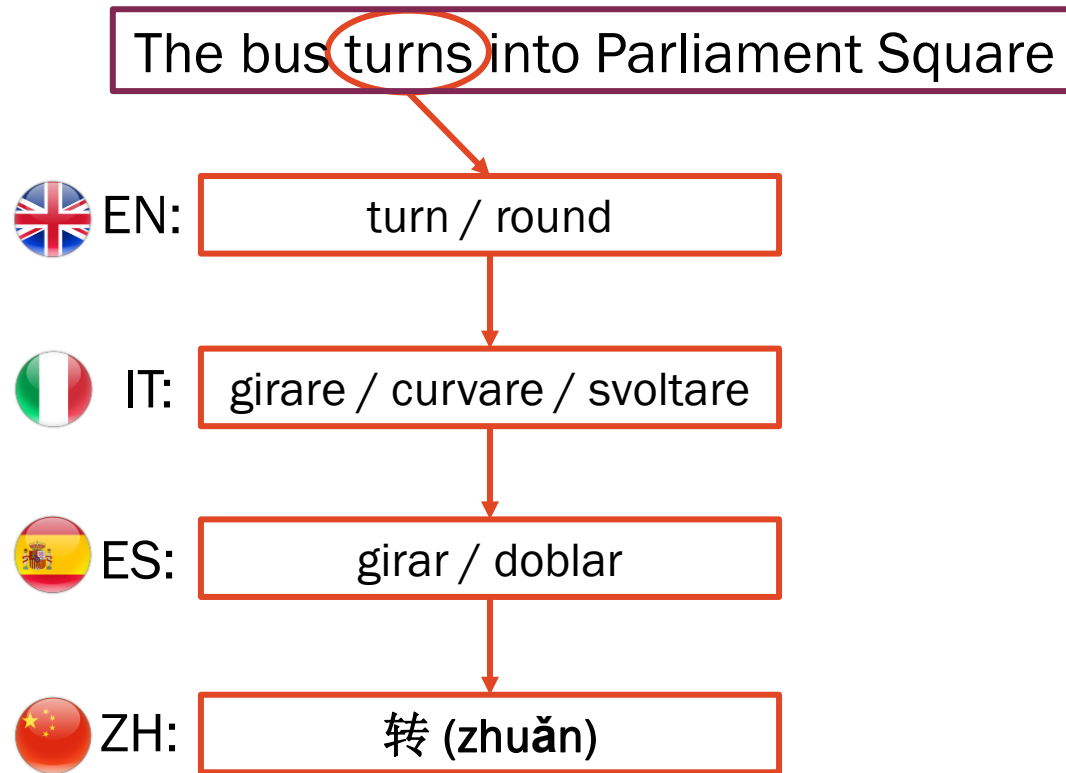


EN: The bus turns into Parliament Square



IMAGACT: the Ontology of Actions

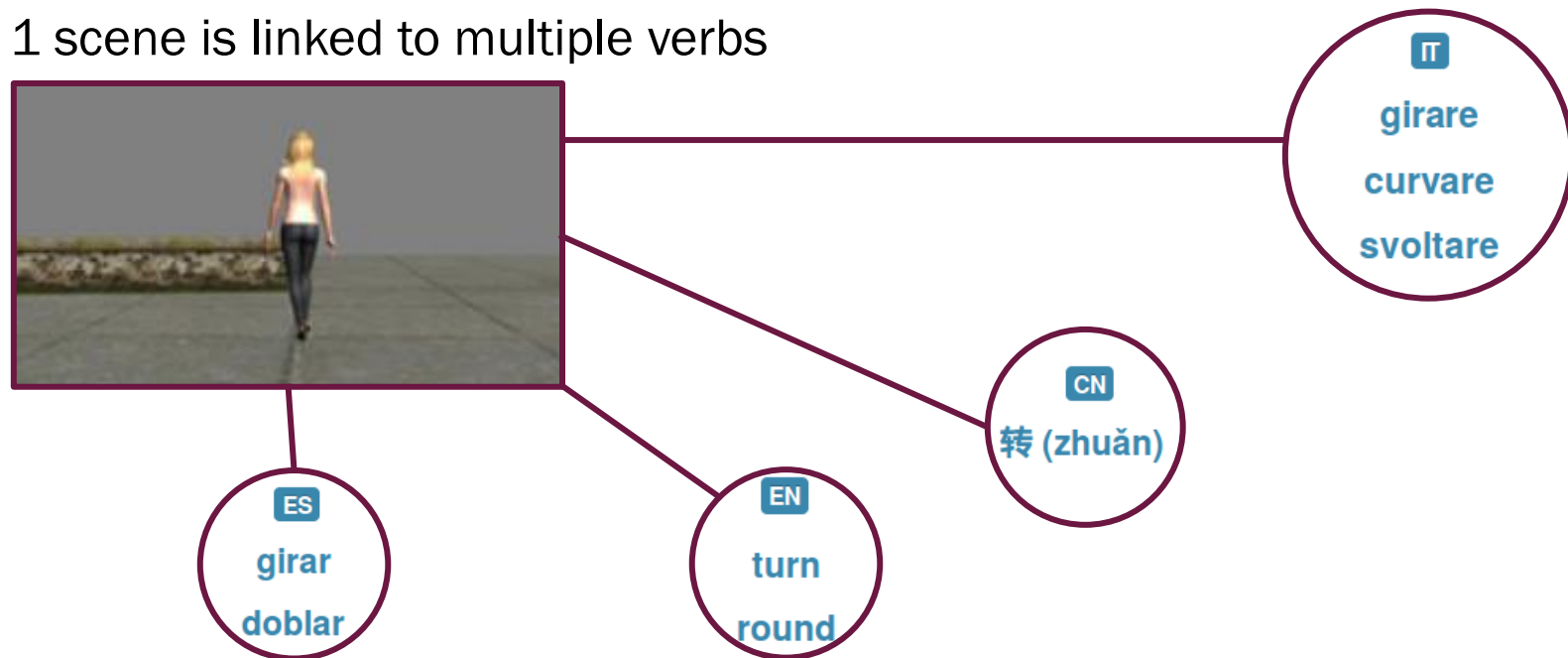
The action type discrimination is a way to reach a correct translation.



IMAGACT: the Ontology of Actions

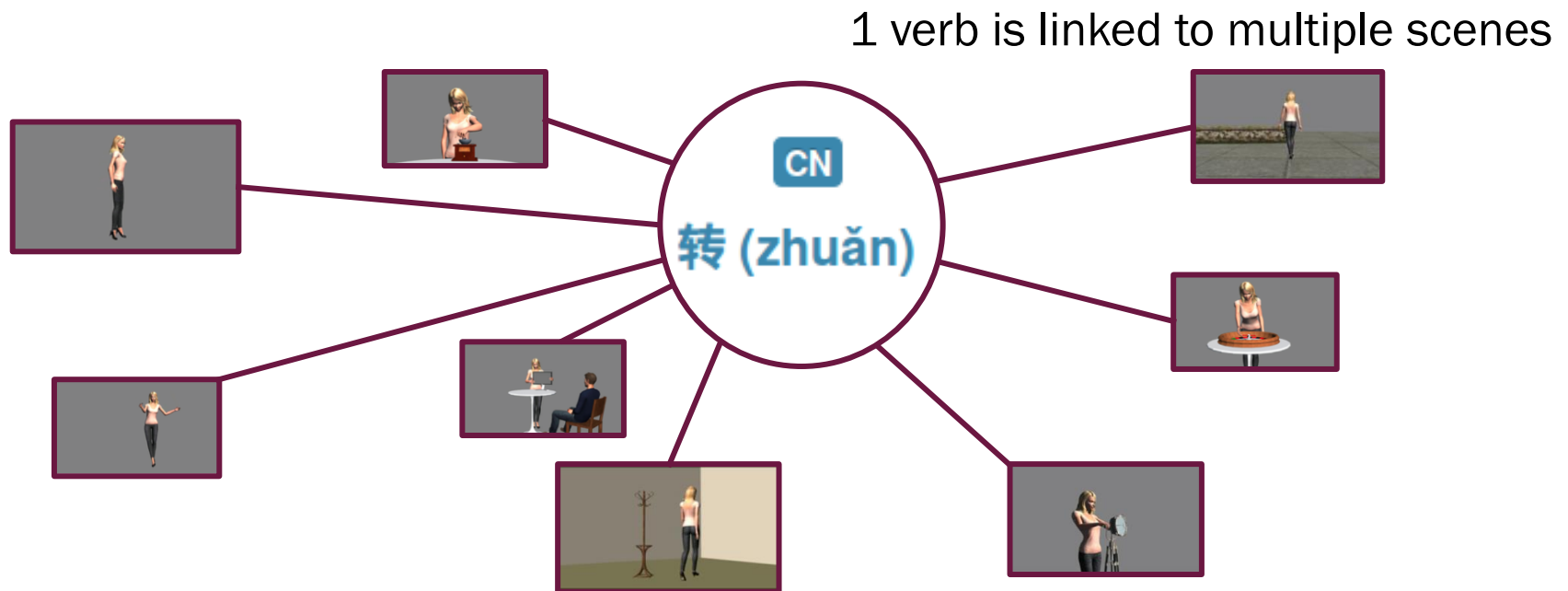
- 1,010 scenes
- 9 fully mapped languages, 13 in-progress
- Verbs in different languages are connected to the scenes they can predicate

1 scene is linked to multiple verbs



IMAGACT: the Ontology of Actions

- 1,010 scenes
- 9 fully mapped languages, 13 in-progress
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IMAGACT-BabelNet linking: The Test Set

- 7 English verbs with
 - High frequency of use in spoken language;
 - High degree of referential ambiguity;
 - High level of action referring possibilities.

put

move

take
- 25 IMAGACT scenes and 30 BabelSynsets selected among the ones connected to the verbs

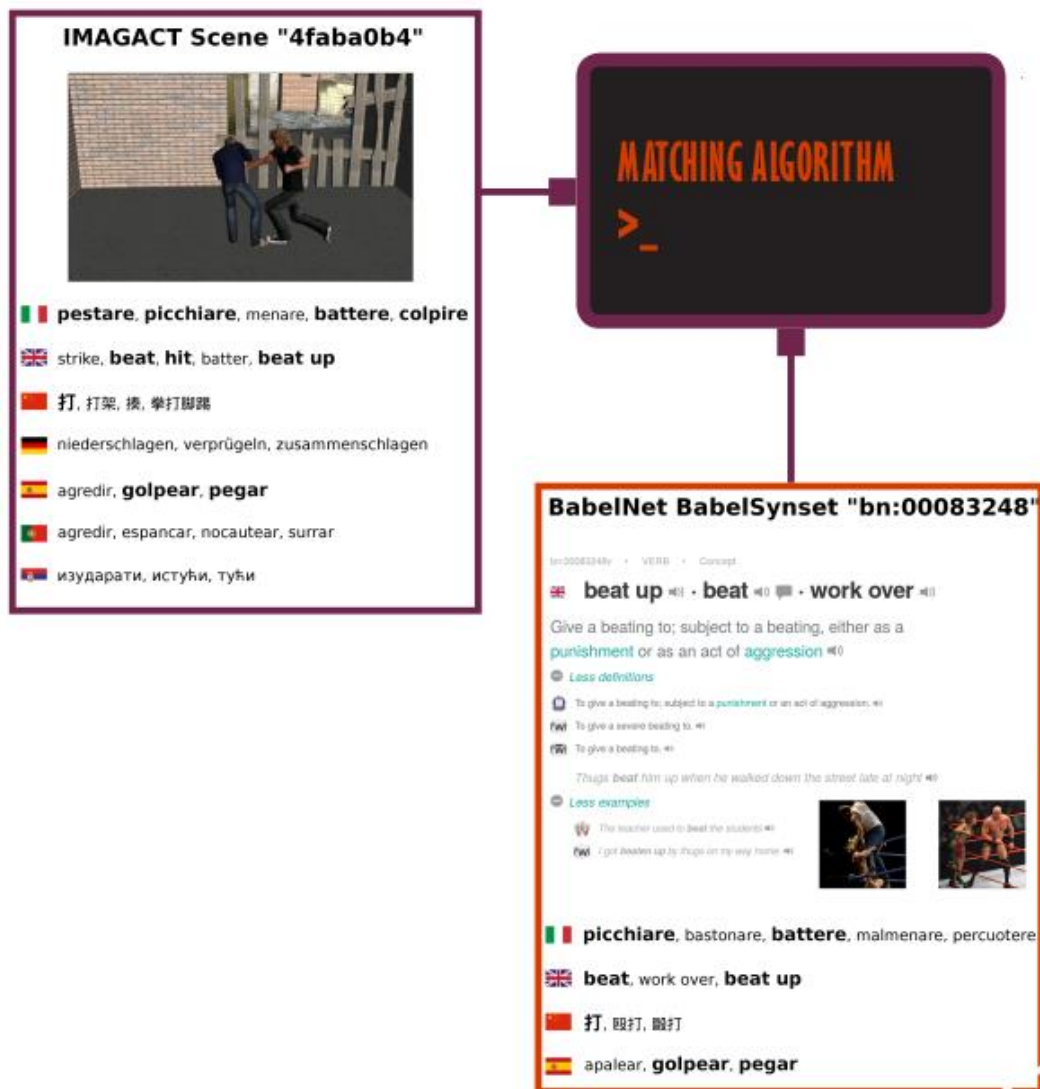
insert

press
- 750 binary judgments (25 scenes x 30 BS) expressed by human annotators

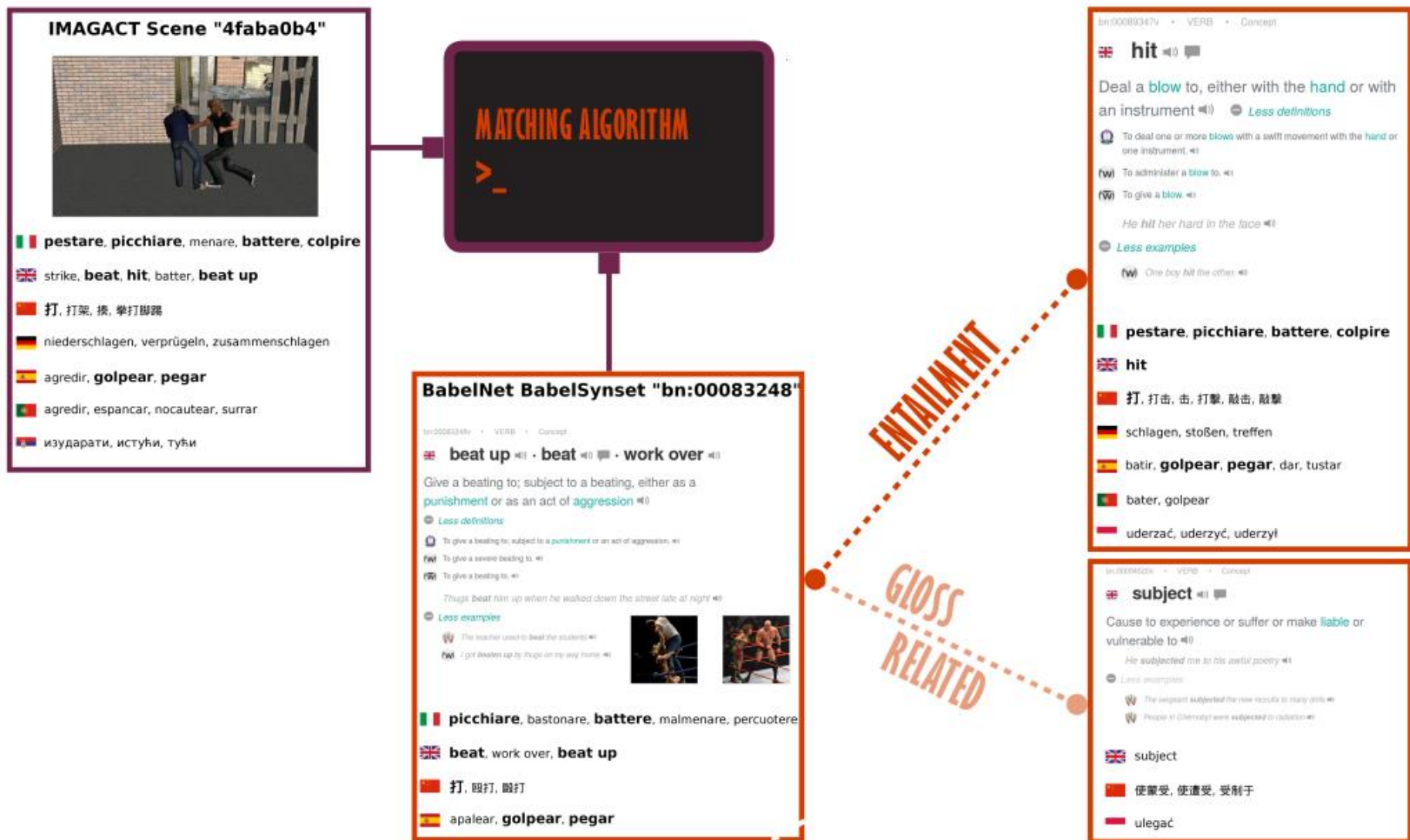
give

strike

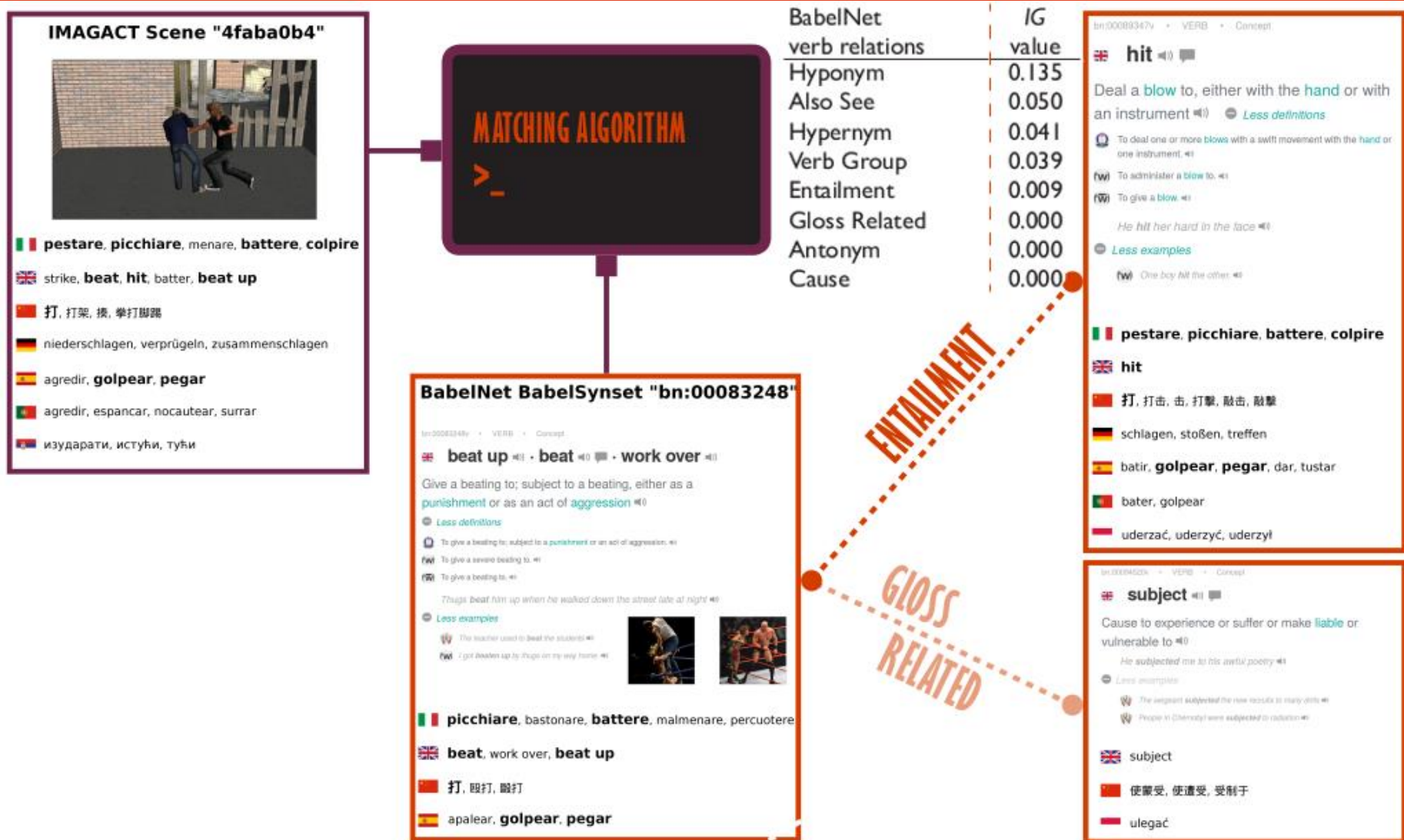
IMAGACT-BabelNet linking: The algorithms



IMAGACT-BabelNet linking: The algorithms



IMAGACT-BabelNet linking: The algorithms



IMAGACT-BabelNet linking: Results

With both the algorithms the first chosen BS is always good to be linked with the scene

BS x scene	Base Alg.	Improved Alg.
% right (n = 1)	100%	100%
% right (n = 2)	84%	88%
% right (n = 3)	76%	83%

This is a preliminary test, a bigger test set is required to

- Make a fine-tuning of the algorithm parameters;
- Use the annotated dataset to train a machine learning algorithm.

Linking advantages for BabelNet

A more informative visual representation of actions inside the BabelSynset by using the IMAGACT scenes in addition to static images.

bn:00083248v • VERB • Concept

EN **beat up** • **beat** • **work over**

Give a beating to; subject to a beating, either as a **punishment** or as an act of **aggression**

— **Less definitions**

Ω To give a beating to; subject to a **punishment** or an act of aggression.

(W) To give a severe beating to.

(W) To give a beating to.

Thugs **beat** him up when he walked down the street late at night

— **Less examples**

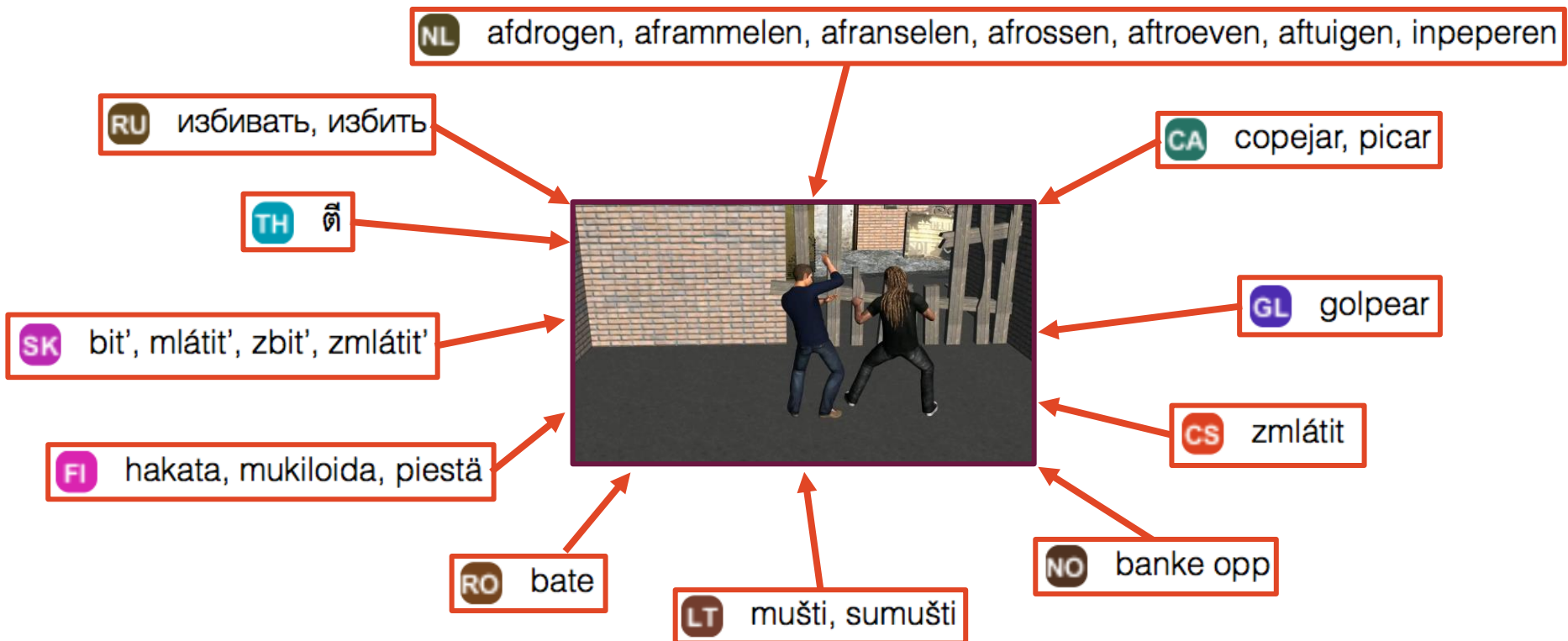
 The teacher used to **beat** the students

(W) I got **beaten up** by thugs on my way home.



Linking advantages for IMAGACT

IMAGACT can exploit the BabelNet semantic network to increase the number of mapped languages and lemmas



General action verbs are a lexical class that have a strong impact on the languages, but it's also very difficult to process automatically:

- high level of ambiguity;
- high frequency in the language usage.

It's hard to perform some Natural Language Processing tasks like:

- Word Sense Discrimination;
- Automatic Translation.

IMAGACT provides a **fine-grained categorization of action concepts** in a language-independent environment. A linking between these two resources is desirable to develop complex disambiguation and ontology-based translation tasks.

Thanks for
your attention