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Learning false friends across contexts

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ABSTRACT: False friends are words in two languages that look or sound similar but differ significantly in meaning in some or all contexts. False friends are confusing for language students and could result in frustration and communication problems. This paper proposes a method to diagnose and prevent false friends mistakes based on students' past learned words, current location and time. The proposed method uses records from the SCROLL system (System for Capturing and Reminding Of Learning Log) to analyze the previous activity of students. We assume that the past activity of a student can be used to predict the meaning intended by the student when looking up a polysemous word. The identification of the intended meaning in the student's current context is then used to provide the student with the appropriate translation, warnings and quizzes, possibly improving the learning process and avoiding false friends future mistakes.

Keywords: Learning Analytics, Ubiquitous learning, False Friends, Computer Supported Language Learning

1 INTRODUCTION

When learning a second language, students can take advantage of the vocabulary of their first language using cognates (Nation, 2003). Cognates are words that sound or look similar in the two languages, have similar meanings, and help students expand their vocabulary by playing the role of 'true friends'.

However, we can all imagine the awkward situations that could arise if the French word *promiscuité* (lack of privacy, crowding) is interchanged with the English word *promiscuity* (i.e., having a lot of different sexual partners) in a sentence. We can also imagine flirting going wrong when a French speaker compliment their English crush using the word *formidable* (i.e., inspiring fear or respect through being impressively large or powerful), when what she actually meant is *formidable* (i.e., inspiring awe). We can understand how strange a Japanese speaker will sound when saying 'My mansion is on the second floor', when what he had in mind was マンション (mansion, i.e., flat,

apartment). The previous situations are faced by language learners and are caused by a tricky category of words: false friends.

False friends are words in two languages that look and sound similar, but differ significantly in meaning in some or all contexts. The degree of complexity of learning false friends depends on whether they are total false friends or partial false friends. Total false friends have completely different meanings in both languages (e.g.: Eng.: *Attend* (to be present); French: *Attendre* (wait)), whereas partial false friends are polysemous words, one of whose meanings is a false friend while others are true cognates (e.g.: Eng.: *Demand* (i.e., request made as of right); French: *Demander* (i.e., to ask; to be looking for; to demand). Figure 1 shows the types of 'friends' that a student will encounter when learning the target language.

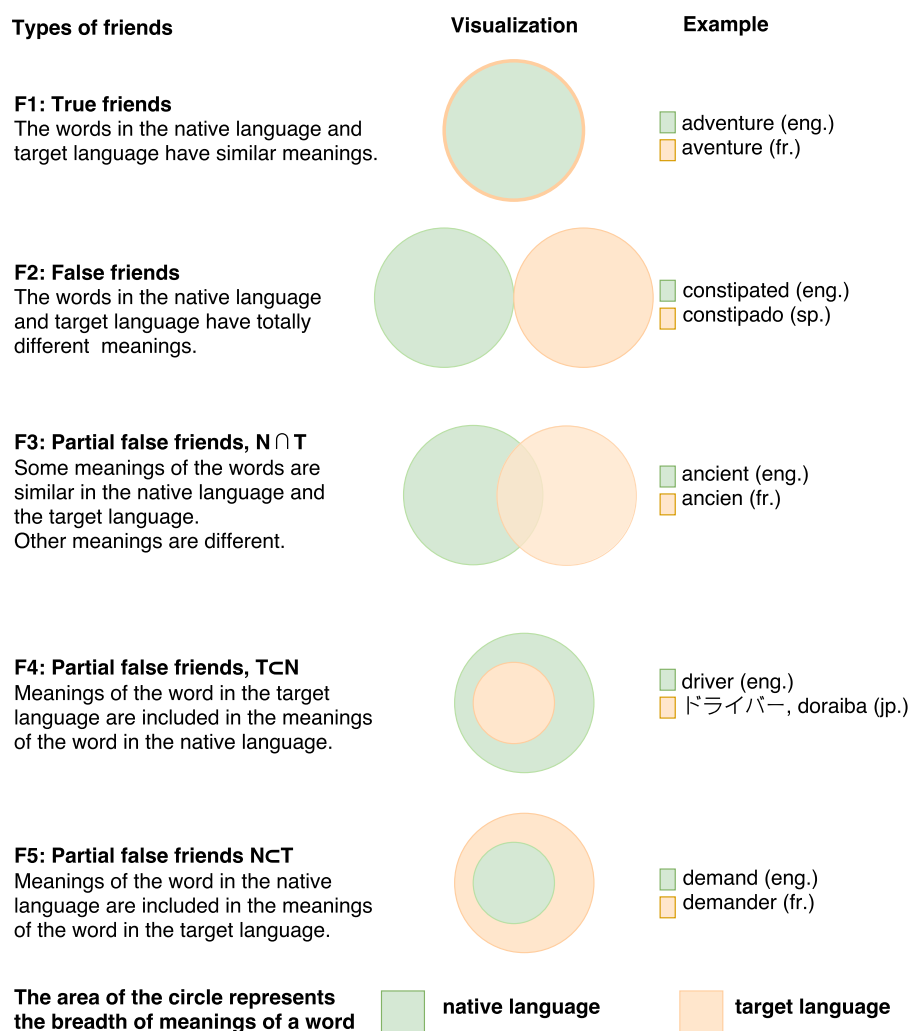


Figure 1: Types of false friends between a student's native language and the learned target language.

Depending on the context, partial false friends play the role of a true or a false friend. This paper proposes a method to diagnose and prevent false friends mistakes based on students' past learned vocabulary, current location and time. First, we analyze the factors that lead to false friends

confusions while learning the target language. We also analyze the types of assimilation problems that could then arise, depending on the type of false friend. In order to prevent false friends confusions, we use the student's past learning logs (previous looked up words, locations, time) to predict the meaning intended by the student when looking up a polysemous words. The identification of the intended meaning is then used to provide the student with the appropriate translation and warnings, possibly improving the learning process and avoiding future mistakes. In order to fortify the learning the student knowledge will be tested. The language learner will get quizzes about the meaning of learned polysemous words in different contexts (Location, time).

2 DIFFICULTIES AND PROBLEMS OF FALSE FRIENDS LEARNING

From the pedagogical perspective, intrinsic and extrinsic factors determine the degree of false friends' difficulty for language (Beltran, 2006). The intrinsic factors contributing to a higher level of difficulty of false friends learning are:

- IF1:* The confusing nature of false friends, and particularly the partial false friends. Some false friends have always a deceptive meaning, whereas some others have deceptive meanings in certain contexts only. This creates uncertainty for students as they could fail to recognize in which contexts the word is a false friend, and in which contexts it is not.
- IF2:* Semantic fields may overlap. Words can have different meanings in both languages, but belong to the same semantic field (e.g.: Japanese: フイルム. firumu means camera film roll).
- IF3:* Because of the large number of true friends, students have a tendency to overgeneralize the words that they come across.

The extrinsic factors contributing to the complexity of false friends learning are:

- EF1:* Language learners are usually encouraged to take advantage of true cognates without being warned of the existence of false friends. This could lead to frustration for the language learner when they notice the actual complexity of the cognates.
- EF2:* Oversimplification of dictionaries by lexicographers where translations sometimes lack of nuances and contexts.

Depending on the type of false friend, the previous factors influence differently the difficulty in learning them. In order to improve false friends teaching, it is important to understand which type of factors influence false friends learning. Table 1 shows which factors affect which type of false friends learning as well as the overall learning difficulty. X is displayed when a type of false friends learning is not affected by a factor. O is displayed when a type of false friend is affected by a factor.

Table 1: Factors affecting False Friends learning and learning difficulty.

	F2: False Friends	F3: Partial False Friends N∩T	F4: Partial False Friends TCN	F5: Partial False Friends NCT
IF1	X	O	O	X
IF2	O	X	X	X
IF3	O	O	O	X
EF1	O	O	O	O

EF2	X	O	O	O
Difficulty	Medium	High	High	Low

False friends are rarely incorporated into language classes despite the difficulties faced by language students when dealing with them. When they are pointed out by the teachers, the words' nuances are often over-simplified and downgrade the accuracy and assimilation of the meaning of the word (Hayward, 1984). In the case of partial false friends, this lack of accuracy can lead to two different situations:

- a loss of some meanings of the word in the target language.
- an addition of some meanings to the word in the target language by projecting the meaning of the word in the native language to the word in the target language.

Figure 2 shows the situations where the oversimplification leads to the loss or addition of meanings.

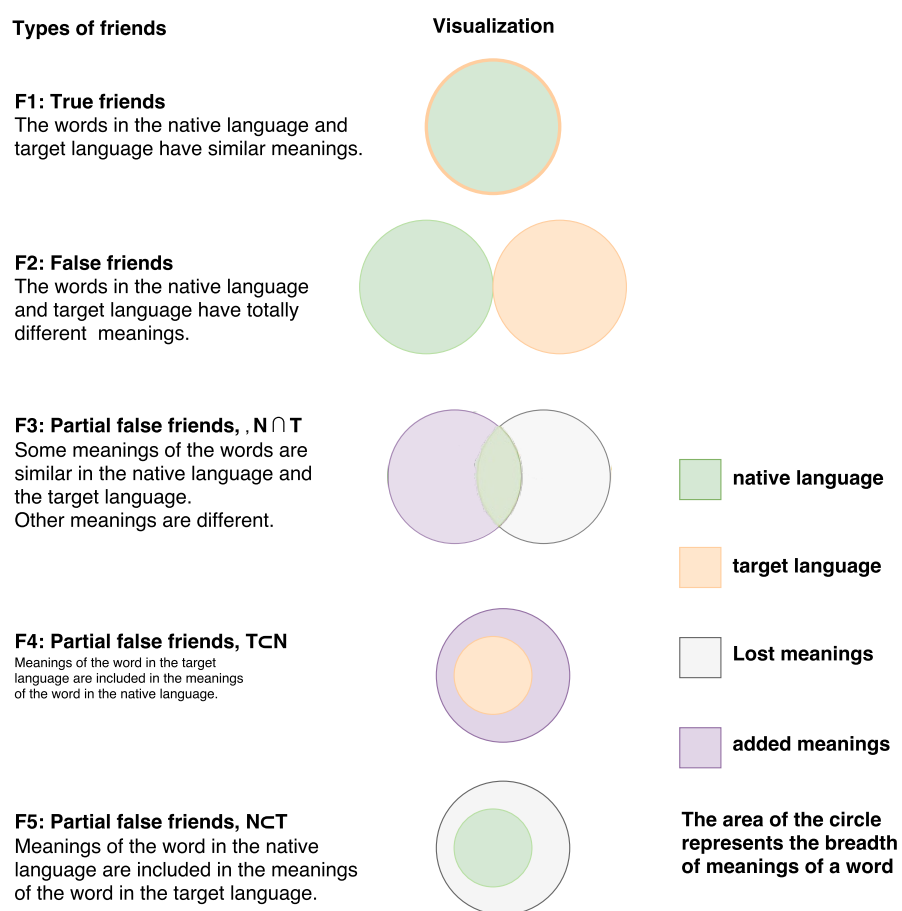


Figure 2: Loss or projection of meanings due to oversimplified teaching of false friends, depending on the type of false friend.

In order to avoid this kind of mistakes, false friends need to be pointed out by the teachers and the correct translations should be given (August, 2005). Moreover, the meanings should not be

presented as one bloc to the student but should be put in a context and restricted to a particular area (Hayward, 1984).

However, in a self learning environment, teachers have less or no control over the learned content. With the rise of smart phones, the use of mobile devices in language learning is a growing trend (Godwin, 2016). Student have more control over their learning pace (Benson, 2005) and the vocabulary they want to learn, but don't have opportunities to communicate which meaning of the word they are looking for.

This paper proposes to take advantage of student past learned words to understand the particular meaning queried by the learner and provide them with the correct translation in their intended context. Moreover, we aim at minimizing the effect of the intrinsic and extrinsic factors affecting false friends learning by showing the learner the different meanings and nuances of the words. The assimilation of the student will be then tested in the context of usage of the word in order to fortify their knowledge.

3 METHOD

3.1 SCROLL system

During this study we use records from the SCROLL System (System for Capturing and Reminding Of Learning Log). Scroll is a digital record of what language students have learned in daily life. It allows the learners to log the new words or sentences they learned along with photos, audios, videos and location (Ogata, 2011). SCROLL captures what learners are learning as well as its contextual data. The users are then reminded of what they learned in the right place and the right time. Moreover, students receive personalized quizzes to fortify the learning. Figure 3 is a screenshot from the SCROLL system that shows a log inserted by a student for the word *Karaoke*. The student appended a picture and a location when creating the log. A Japanese translation of the word *Karaoke* is automatically provided to the student, and the time is automatically registered.

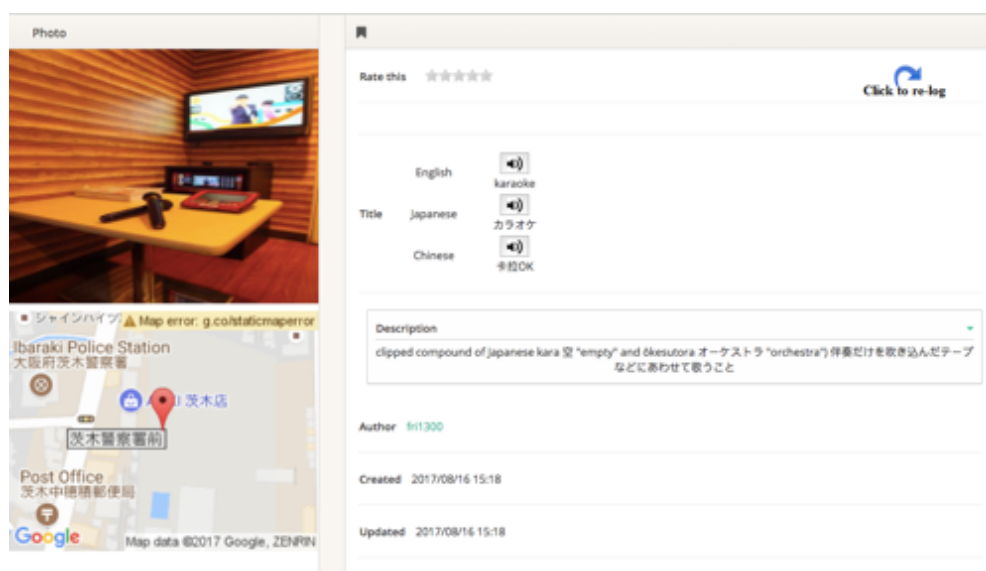


Figure 3: Screenshot from the SCROLL system showing a log inserted by a student.

The logs we will be using include meta-data such as:

Knowledge: words that students have learned in the past

User: author identification

Place: place where the learning happened (cinema, restaurant)

Time: time when the learning took place

Currently SCROLL has 1648 users and contains 24355 logs. The system is used mainly by students learning Japanese.

3.2 Contextual false friends learning

When using the SCROLL system, Japanese language learners insert logs containing a word in English and learn its Japanese translation. However, if the word is a false friend, students get a translation that does not usually reflect the context, the different meanings and the nuances of the word. In order to provide learners with the right translation in the right context, we have to understand their intended meaning. We propose to analyze the past activity of students to extract the meaning they are looking for. We assume that the past activity of a student gives a context that can be used to extract the meaning intended by the student when looking up a polysemous word. The following meta-data are used to predict the meaning the student is looking for:

Past knowledge (words): to measure the similarity between the current word the student is looking up and past words the student looked up in the system.

Time: to measure the similarity between the current word the student is looking up and the set of words the student looked up at the same period of time.

Location: to measure the similarity between the word the student is looking up and the set of words the student looked up at the same location.

We propose to measure the similarity using Jiang similarity measure. Jiang similarity measure based information content of each concept in WordNet. It assumes that each concept includes information in WordNet and the more common information two concepts share, the more similar the two concepts are (Meng, 2013). Previous studies where semantic distance measures were compared experimentally found that Jiang's measure gave the best results overall (Budanitsky, 2001).

Figure 4 shows an example. The student looked up the word *driver*. However, the word *driver* has different meanings and different translations in Japanese for each of those meaning:

Person who drives a vehicle: ドライバ (doraiba)

Train driver: 運転士 (untenshi)

Mass driver : マスドライバー (masu doraiba)

Computing : 仮想デバイスドライバー (kasoo debaisu doraiba)

Golf club: ドライバー (doraiba)

Screwdriver (British English): ドライバー (doraiba)

	English Magazine Japanese 雑誌
shin 2014/02/16 06:10	
	English Stepladder Japanese 脚立
shin 2014/02/16 06:09	
	English Driver Japanese ドライバー
shin 2014/02/16 06:09	

Figure 4: Screenshot from the SCROLL system showing the student past knowledge of a student looking for the meaning of the word driver

In order to understand which meaning the student is looking for, we look at the previous knowledge, the words looked up at the same period of time than the word *driver* and the words looked up at the same location of the word *driver*. In this case, the word looked up just before the word *driver* is *stepladder*. The semantic distance between the words *screwdriver* and *stepladder* is smaller than the semantic distance between the word *stepladder* and each of the words: *car driver*, *train driver*, *computer driver*, *mass driver* and *golf club*. We can conclude that the meaning the student is looking for is *screwdriver*, and that the translation that should be given is ドライバー (*doraiba*).

3.3 Preventive false friends learning

As stated previously, students face intrinsic and extrinsic factors that make false friend learning more difficult. We propose to tackle the factors by providing preventive false friends learning. Upon the encounter of a new false friend, the student will receive a warning that shows a comprehensive list of translations in different contexts. The displayed warning is different for each type of false friends as shown in table 2.

Table 2: Warning for different type of false friends..

False Friend Type	Type of warning received
F2: False Friends	Warning stating that the word is a false friend.
F3: Partial False Friends N∩T	Warning that: <ul style="list-style-type: none"> states that the word is a partial false friend.

- lists the different translations for the different meanings of the word.
- lists the cognates of the word in the target language that have meanings that are non-existent in the native language.

Warning that:

F4: Partial False Friends
TCN

- states that the word is a partial false friend.
- item lists the different translations for the different meanings of the word.

Warning that:

F5: Partial False Friends
NCT

- states that the word is a partial false friend.
- lists the cognates of the word in the target language that have meanings that are non-existent in the native language.

The expected consequences of displaying warnings are:

Consequence1: Awareness that the words are used differently in different contexts: The warning states the false friend type.

Consequence2: Knowledge that avoids over-generalization (addition of meanings) : The warning lists the different translations in different contexts.

Consequence3: Knowledge that avoids over-simplification (loss of meanings): The warning lists the different translations in different contexts.

Table 3 shows how the different consequences reduce the effects of the intrinsic and extrinsic factors depending on the type of false friends.

Table 3: Consequences affecting the reduction of intrinsic and extrinsic factors depending on the type of false friends.

	F2: False Friends	F3: Partial False Friends $N \cap T$	F4: Partial False Friends TCN	F5: Partial False Friends NCT
IF1	X	Consequence1	Consequence1	X
IF2	Consequence1	X	X	X
IF3	Consequence1	Consequence1	Consequence1	X
EF1	Consequence1	Consequence1	Consequence1	Consequence1
EF2	X	Consequence2, Consequence3	Consequence2, Consequence3	O

In the previous example, the student looked up the word driver. After predicting the intended meaning of the student, the student will be provided with the word ドライバー (doraiba) as a translation. However, *driver* and ドライバー are partial false friends of type 4 (F4). In this case, the student might use the word ドライバー (doraiba) as they would have used the word driver in English to express *Train driver*, *mass driver* or *driver in computing*. To avoid this mistake, we propose to display a warning to the student showing the different translations of the word driver, depending on the meaning (as shown in Figure 5). The warning gives the student awareness about the complexity of the word, and consciousness that the translation provided by the system can be used in particular contexts only.

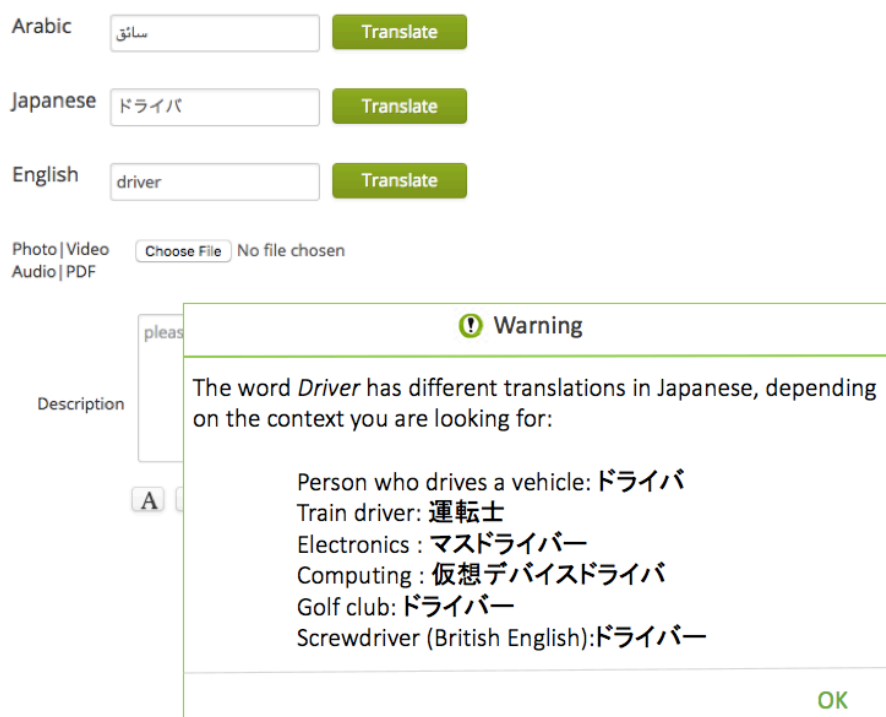


Figure 5: Warning displaying different meanings of the word depending on the context

3.4 Quizzes across contexts

In order to determine the effect of contextual translations and warnings on false friends learning, students will be given quizzes to test their acquired knowledge. SCROLL system offers the opportunity to give quizzes to students depending on their location. When the students will be present at a location related to one of the meanings of the word a quiz will appear asking the student about the translation of the word in this particular context as shown in figure 6. The quizzes will be given to the group of students that received the contextual translation as well as the warnings. Another group of students that didn't get the contextual translation and the warnings will play the role of a control group and be subjected to quizzes as well. The results will be compared to identify the effect of the previous method on false friends learning.



<p>At a train station</p> <p>What is the translation of the word: train driver</p> <p>a-ドライバ b-運転士 c-仮想デバイスドライバ</p>	
<p>On the road</p> <p>What is the translation of the word: car driver</p> <p>a-ドライバ b-運転士 c-仮想デバイスドライバ</p>	
<p>At a golf club</p> <p>What is the translation of the word: golf club</p> <p>a-ドライバ b-運転士 c-仮想デバイスドライバ</p>	

Figure 6: Quizzes displayed to the students depending on their location

4 DISCUSSION

We proposed a method to prevent false friends mistakes. The method is applied in the context of mobile learning. The main features of mobile learning are accessibility, immediacy, interactivity and situating of instructional activities (Ogata, 2004), benefit students during the learning process. However, mobile learning does not allow language students to share their intended meaning while looking up a polysemous word. The first part of our work consists of predicting the meaning intended by the student when they are looking up a polysemous word. In order to do so, the proposed method uses records from the SCROLL system (System for Capturing and Reminding Of Learning Log) to analyze the previous activity of students. We assumed that the students' past learned words, current location and time can be used to predict the meaning intended by the student when looking up a polysemous word. The identification of the intended meaning is then used to provide the student with the appropriate translation, based on the intended meaning. The second part proposes to display warnings and quizzes to the students. The warnings explain the meaning of the word and provide the student with different translations in the different contexts. The quizzes aim at fortifying the knowledge of the students, possibly improving the learning process.

This method puts into application the theoretical pedagogical approach of false friends learning. Future work will evaluate the accuracy of the prediction of the students' intended meaning. We will also evaluate the effects of the warnings by comparing the learning performance of the students

before and after receiving them. The impact of the quizzes will be evaluated by comparing the false friends recall rate of the student before and after the display of the quizzes.

5 CONCLUSION

This paper proposes a method to diagnose and prevent false friends mistakes based on students' past learning activity. The proposed method uses records from the SCROLL system (System for Capturing and Reminding Of Learning Log) to analyze the previous activity of students. We assumed that the students' past learned words, current location and time can be used to predict the meaning intended by the student when looking up a polysemous word. The identification of the intended meaning is then used to provide the student with the appropriate translation, warnings and quizzes, possibly improving the learning process and avoiding future mistakes.

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