



# AFFIMO

## Vers un système *open-source* de détection textuelle des AFFinités et éMotions de l'utilisateur

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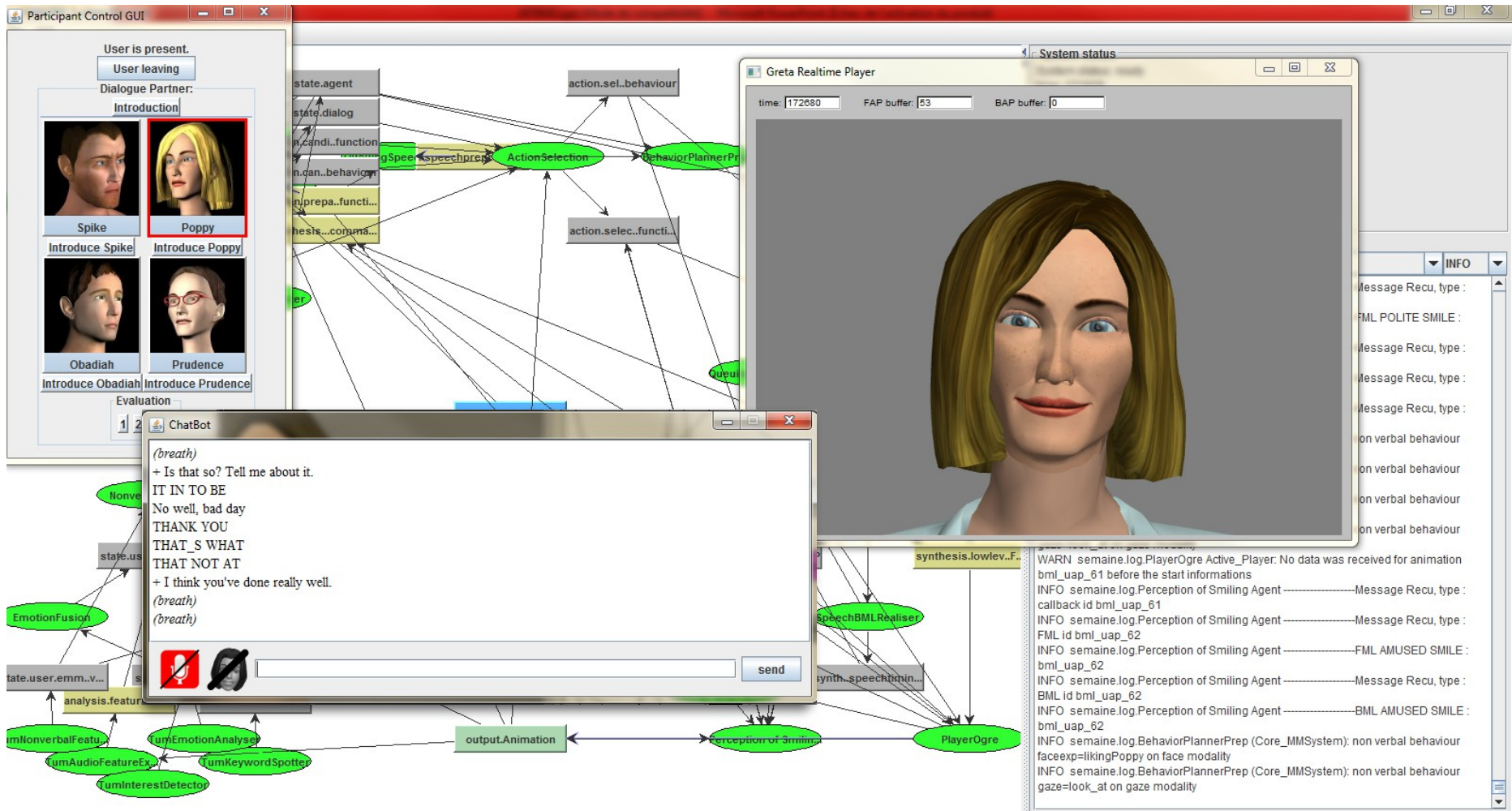


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# I. Problematic



# II. Approaches

## ➤ Keywords spotting / Lexical affinity

- *Method*: detection of affective terms
- *Resource*: dictionary of affective terms
- *Pros*: simplicity of the method
- *Cons*: no recognition of affective sentence without affective terms

Ex. “I’m happy” - “My husband just filed for divorce”

++ *others rules (grammar, syntax, symbols, ...)*

## ➤ Statistical methods / Machine learning techniques

- *Method*: machine learning algorithm trained on annotated corpus
- *Resource*: large corpus of affective annotated text
- *Pros*: good method for large text input (paragraph)
- *Cons*: no semantic consideration

++ *Combinations keywords spotting + machine learning*

# III. Examples: Classical text / messages

## ➤ Emologus (LeTallec et al., 2010)

- *Domain*: children emotions (specific dictionary of affective terms)
- *Method*: Keywords spotting + semantic relations rules (verbs and adjectives)

Ex. “to break” :  $(x,y) \rightarrow -y$ ”

“break a jewelry”  $\rightarrow$  negative

“break a monster's leg”  $\rightarrow$  positive

## ➤ EmoText (Osherenko and André, 2009)

- *Domain*: movies (neutral concept + WordNet-Affect)
- *Method*: Keywords spotting + grammatical rules

Ex.

Intensifiers rules on interjections, exclamation, adverbs, repetitions:

“Oh, what a beautiful present!”  $\rightarrow$  beautiful ++

“We are *utterly* powerless”  $\rightarrow$  powerless --

Negation rules: “I’m not happy”  $\rightarrow$  change valence

# IV. *Examples: Informal text / messages*

## ➤ **EMMA – Emotion Metaphor and Affect (Li Zhang, 2009)**

- *Method:* Keywords spotting + syntactic detection of affective metaphor
- *Domain:* specific metaphor (emotions as physical objects or events)

*Ex.* “joy ran through me”, “my anger returns in a rush”

## ➤ **EmoHeart (Neviarouskaya et al., 2007)**

- *Method:* Keywords spotting + symbolic rules
- *Domain:* Internet chat (WordNet-Affect + emoticons & abbreviations dictionaries)

*Ex.* “;-)” “:-(“ “wow” “BL” for “belly laughing”

# V. Example: Machine learning technique

## ➤ Empathy Buddy (Liu *et al.*, 2003)

*Method:* Keywords spotting + machine learning

### ➤ *Knowledge base of commonsense*

- **Annotation of affective sentence using keywords spotting**

- **Concepts associated to emotions**

  - ex. “car accident is scary” -> “car accident”: fear

- **Propagation of the affective annotation with two or three pass**

  - ex. “Something exciting is both happy and surprising”

    - “Rollercoasters are exciting”

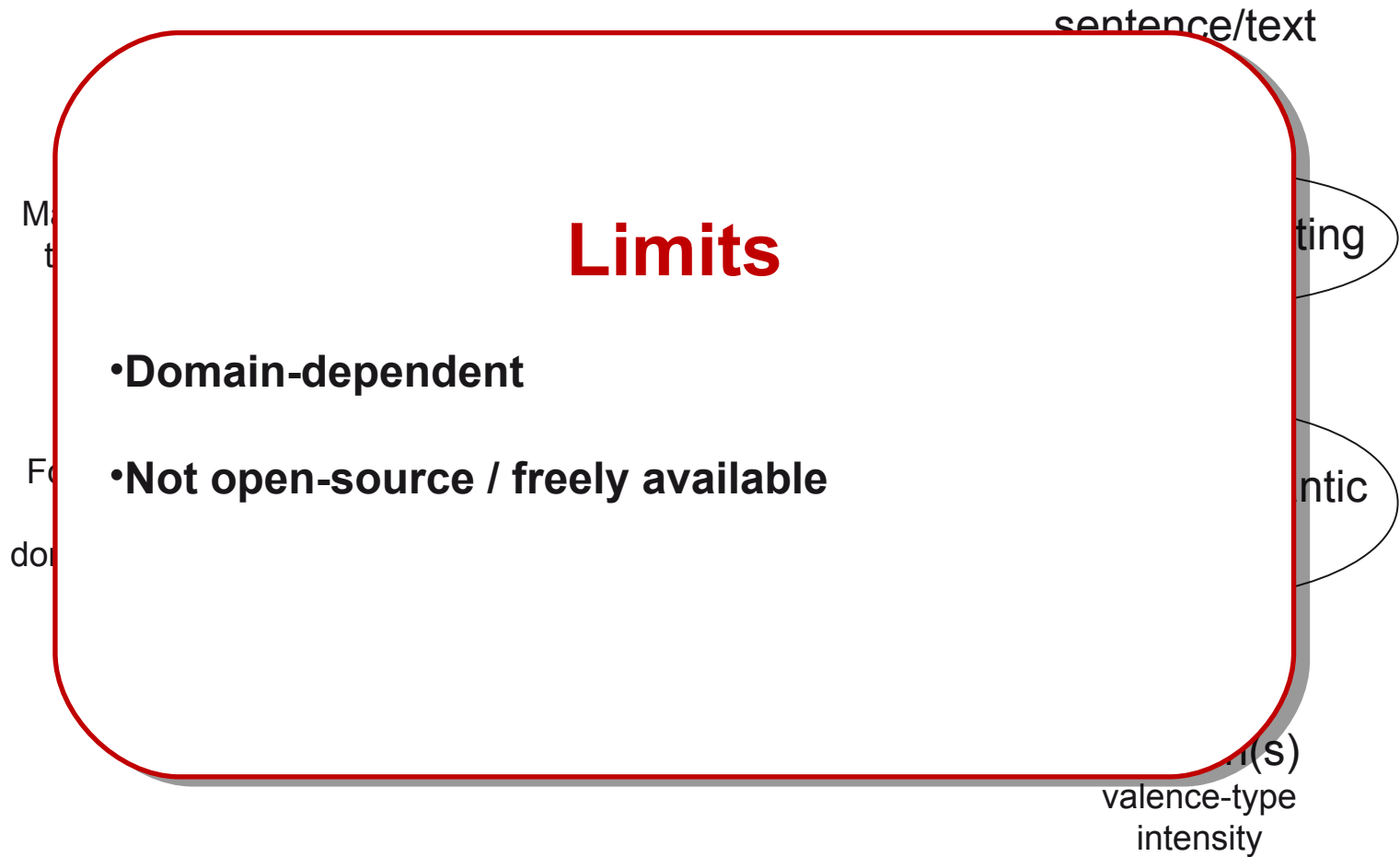
    - “Rollercoaster are typically found at amusement parks”

- **Dynamics of emotions**

  - ex. *decay technique: sentence-emotional; sentence-neutral*

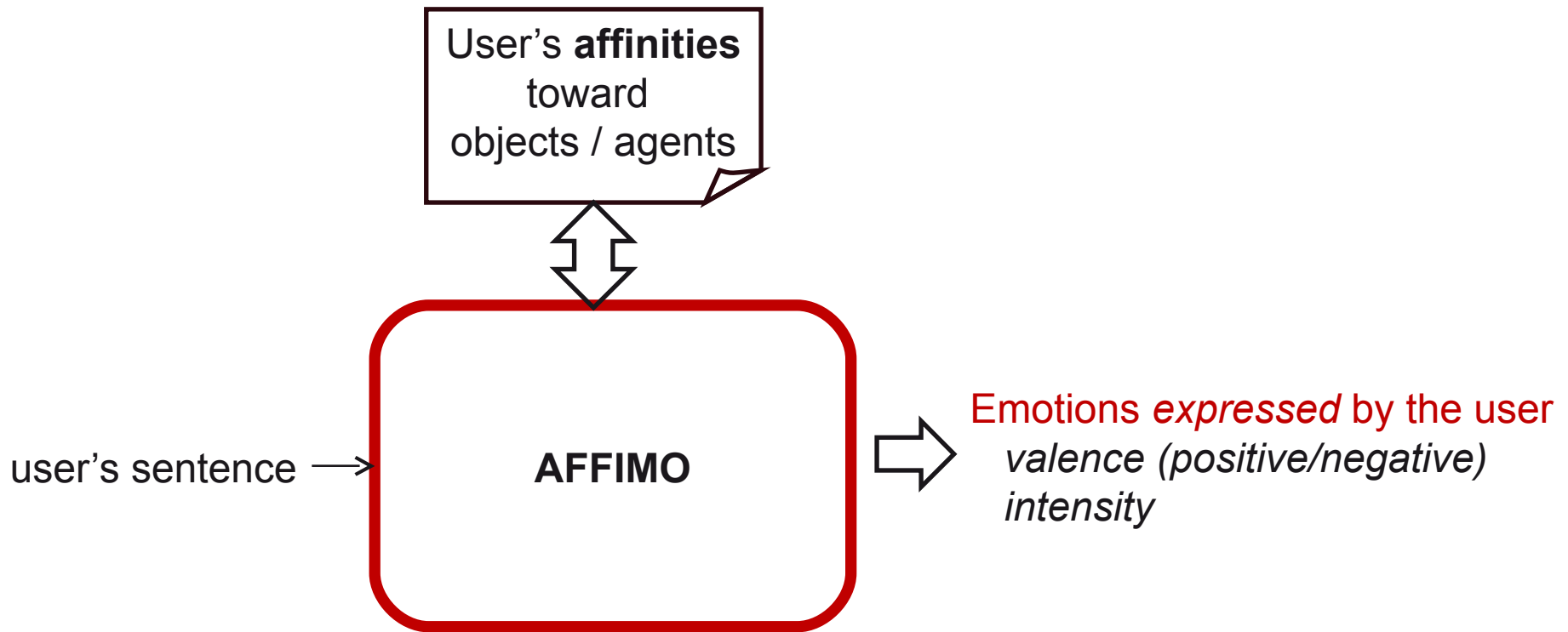
    - meta-emotions: Relief: Fear followed by happy*

# V. Existing models



## 6. AFFIMO: AFFinities and eMotions

- To start to develop an open-source system to detect user's emotions in written sentences





# 6. AFFIMO: AFFinities and eMotions

## ✓ **Lexical analysis** of user's message

- Analyze of the *valence* of words in the message
- Dictionary of *emotional terms* (SentiWordNet) + smileys

## ✓ **Syntactic analysis** of user's message

- Keywords spotting to detect *negations and intensifiers*
- Database of *intensifiers* (Brooke, 2001)

## ✓ **Semantic analysis** of user's message

- Lemmatization of the sentence using TreeTagger (Schmid, 1995)
- Definition of effects of verbs on subjects and objects

ex. *eat* : subject +, object –

“the dog eats the mouse” :

positive for the dog, negative for the mouse

# 6. AFFIMO: AFFinities and eMotions

## ✓ Affinities detection based on the structure

<adjective, noun> <subject, hate/like, object>

- Analyze of the *positive and negative emotional connotations* of adjectives preceding nouns (based on SentiWordNet)
- Positive adjective : increase the **degree of liking** toward *noun*
- Negative adjective : decrease the **degree of liking** toward *noun*

## ✓ Affinities file

- Contain all the affinities detected in the text
- Automatically updated
- Default affinities can be setup
- Affinity used to compute the user's emotions

ex. "The lovely dog eat this nasty cat"  
lovely dog      nasty cat  
*like(user,dog)*      *dislike(user,cat)*



*eat: subject +, object -*

➤ **User: emotion +**

# 6. AFFIMO: AFFinities and eMotions

✓ Ongoing open-source project

✓ Limits

- *Utility* of the object to compute user's emotions
- Grammatical rules (repetitions, exclamations, ....)
- Comparison with other affective dictionaries (ex. WordNet-Affect)
- Conflicts in affective dictionaries (Serban et Pauchet, WACAI 2012)
- Emotion types
- History of dialog
- Evaluation on corpus & with users
- Not real-time ...





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