A semantic representation of spatial relations in literary texts

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Outline of paper

1. Background
2. Method
3. Trajectories of Threading
4. Focusing and Threading
5. Character Description and Threading
6. Some Conclusions
Human linguistic processing of spatial relations is complex and varied
Human linguistic processing of spatial relations is complex and varied

Example
the bee is on your north/right shoulder (Pederson et al., 1998:565)
Background

Two perspectives:
- internal (spatial framework)
- outside perspective (map)
Background

Two perspectives:
- internal (spatial framework)
- outside perspective (map)

Narratives tend to elicit the internal perspective (Bryant and Tversky, 1999)
Immediacy with respect to point of view of protagonist (Rinck and Bower, 2000)
Background

Immediacy with respect to point of view of protagonist (Rinck and Bower, 2000)

- readers focus on point of view of protagonist
- items closer to protagonist are more salient
Background

But...
Background

But... literary narrative worlds are highly underspecified (Pavel, 1986)
Background

But... literary narrative worlds are highly underspecified (Pavel, 1986)

Example

ACT I
SCENE I. Elsinore. A platform before the castle.
FRANCISCO at his post. Enter to him BERNARDO
But... literary narrative worlds are highly underspecified (Pavel, 1986)

Example

**ACT I**
**SCENE I.** Elsinore. A platform before the castle.
**FRANCISCO** at his post. Enter to him **BERNARDO**

Example

Jeanne, ayant fini ses malles, s’approcha de la fenêtre, mais la pluie ne cessait pas.
[Jeanne, having finished her bags, approached the window, but the rain was still falling.]
”...narrative space remains a largely unexplored territory...” (Ryan, 2012)
"...narrative space remains a largely unexplored territory..." (Ryan, 2012)

Some distinctions:

- spatial frame (immediately surrounding locations and events)
- setting (socio-historical-geographical setting)
- story space (spatial frames plus mentioned spaces)
- narrative world (including reader’s imagination)
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6. Some Conclusions
An Onomasiological Perspective

- corpus data
- semantic representation
- natural language generation
Based on topoi

A topos is:
- a narrative sequence
- of variable length
- recognizable as recurring and therefore conventional
Some examples of topoi

Two brothers fall out
A guy walks into a bar
Boy meets girl
Father favours younger son (think of the Bible)
/etc.
<table>
<thead>
<tr>
<th>Author</th>
<th>Books</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. de Balzac</td>
<td>La fille aux yeux d’or, Le chef d’oeuvre inconnu, Le colonel Chabert, L’élixir de longue vie</td>
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<tr>
<td>G. Flaubert</td>
<td>L’éducation sentimentale, Salammbô, Un coeur simple</td>
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<tr>
<td>Th. Gautier</td>
<td>Arria Marcella. Souvenir de Pompéi</td>
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<td>V. Hugo</td>
<td>Notre Dame de Paris</td>
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<tr>
<td>J.-K. Huyssmans</td>
<td>À rebours</td>
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<tr>
<td>G. de Maupassant</td>
<td>Contes de la bécasse, La maison Tellier, Une vie</td>
</tr>
<tr>
<td>Pr. Mérimée</td>
<td>Colomba</td>
</tr>
<tr>
<td>G. de Nerval</td>
<td>La main enchantée</td>
</tr>
<tr>
<td>Stendhal</td>
<td>La Chartreuse de Parme, Le Rouge et le Noir</td>
</tr>
<tr>
<td>É. Zola</td>
<td>L’argent, Germinal</td>
</tr>
</tbody>
</table>
It was in Megara, on the outskirts of Carthage, in the gardens of Hamilcar. The soldiers he had commanded in Sicily were feasting to celebrate the anniversary of the battle of Eryx, and since the master was absent, and they were many, they ate and drank freely.
intro(megara)
intro(carthage)
intro(hamilcar)
intro(gardens)
near(megara, carthage)
possess(hamilcar, gardens)
in(megara, gardens)
A graphical representation of the semantic relations

exist(carthage)
near(megara, carthage)
exist(megara)
in(megara, gardens)
exist(gardens)
exist(hamilcar)
possess(hamilcar, gardens)

Figure: A Directed Acyclic Graph (DAG) for part of the Hamilcar passage
Figure: The threading as found in the text of the Hamilcar passage
An alternative threading

exist(megara) near(megara, carthage) in(megara, gardens) exist(carthage) exist(hamilcar) possess(hamilcar, gardens)

Figure: The threading for *Hamilcar possessed gardens near Megara*
Areas of focus here

- Physical scenes
- Humans
Outline

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Example

object ⇒ parts

Ses maisons blanches avec leurs toits pointus de tuiles rouges ...
[Its white houses with their pointed roofs covered in red tiles...]

Trajectories of Threading: some observed examples
Example

container ⇒ contents

...le canal Saint-Martin, fermé par les deux écluses étalait en ligne droite son eau couleur d’encre. Il y avait au milieu, un bateau plein de bois, et sur la berge deux rangs de barriques.

[...the Saint-Martin canal, enclosed by two locks, spread out in a straight line its inky water. In mid-canal there was a boat full of wood, and on the bank two rows of barrels.]
Trajectories of Threading: some observed examples

Example

- event ⇒ setting ⇒ participants ⇒ actions

À cette époque, une fête était un merveilleux spectacle que de royales richesses ou la puissance d’un seigneur pouvaient seules ordonner. Assises autour d’une table éclairée par des bougies parfumées, sept joyeuses femmes échangeaient de doux propos...

[In those days, a feast was a marvelous spectacle that only the riches of royalty or the power of a seigneur could command. Seated around a table lit by perfumed candles, seven joyous women exchanged soft words...]
Research question

What threadings are used?
Which are the most frequent ones?
1 Background

2 Method

3 Trajectories of Threading

4 Focusing and Threading

5 Character Description and Threading

6 Some Conclusions
Boy meets girl:

Example (Introduction of Mme Arnaud)

Elle était assise, au milieu du banc, toute seule

[She was seated alone on the bench]
Boy meets girl:

Example (Introduction of Mme Arnaud)

Elle était assise, au milieu du banc, toute seule
[She was seated alone on the bench]
Figure: A coarse DAG representing the meeting of Frédéric Moreau and the still unnamed Mme Arnaud.
Focusing and Threading: *L’éducation sentimentale*

**Figure:** A finer DAG representing the meeting of Frédéric Moreau and Mme Arnaud
The context for the meeting...
The context for the meeting...

Example

Le 15 septembre 1840, vers six heures du matin, la Ville-de-Montereau, près de partir, fumait à gros tourbillons devant le quai Saint-Bernard. Des gens arrivaient hors d’haleine ; des barriques, des câbles, des corbeilles de linge gênaient la circulation ; les matelots ne répondaient à personne ; on se heurtait ;

[On September 15th, 1840, at around 6 a.m., the Ville-de-Montereau was about to depart, and large clouds of smoke rose from it as it stood in front of the Saint-Bernard dock. People were arriving out of breath; barrels, cables and baskets of cloth made movement difficult; the sailors answered no one; people were bumping into each other...]

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Focusing and Threading: *L’éducation sentimentale*

**Figure:** A DAG for the beginning of the dock scene
Focusing and Threading: *L’éducation sentimentale*
Focusing and Threading: *L’éducation sentimentale*

An alternative order

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Le 15 septembre 1840, vers six heures du matin, des gens arrivaient hors d’haleine au quai Saint-Bernard. La Ville-de-Montereau, près de partir, fumait à gros tourbillons. On se heurtait ; les matelots ne répondent à personne ; des barriques, des câbles, des corbeilles de linge gênaient la circulation...
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Introducing Madame Arnaud
Introducing Madame Arnaud

Example

*Elle était assise, au milieu du banc, toute seule;*
More details...
More details...

Example

Elle avait un large chapeau de paille, avec des rubans roses qui palpitaient au vent derrière elle. Ses bandeaux noirs, contournant la pointe de ses grands sourcils, descendaient très bas et semblaient presser amoureusement l’ovale de sa figure.

[She was wearing a large straw hat with pink ribbons which waved behind her in the wind. Her black curls passed close to the points of her thick eyebrows, and as they fell, seemed to caress the oval of her face.]
Figure: Part of the ‘library’ DAG of Madame Arnaud’s body
Character Description and Threading: Madame Arnaud

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Some tendencies... the dominance of the head
(cf. Frank, Vul, Johnson, 2009; Massardier-Kenney, 1988)

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Arcs</th>
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<tbody>
<tr>
<td>head</td>
<td>17</td>
</tr>
<tr>
<td>hands</td>
<td>4</td>
</tr>
<tr>
<td>body</td>
<td>4</td>
</tr>
</tbody>
</table>

**Table:** Number of thread arcs entering a body part zone
Character Description and Threading: Madame Arnaud

Table: Number of thread arcs within a body part zone

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Arcs</th>
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</thead>
<tbody>
<tr>
<td>within head</td>
<td>15</td>
</tr>
<tr>
<td>within hands</td>
<td>1</td>
</tr>
<tr>
<td>within body</td>
<td>0</td>
</tr>
<tr>
<td>Body Part to Body Part</td>
<td>Count</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>head to body</td>
<td>3</td>
</tr>
<tr>
<td>body to head</td>
<td>2</td>
</tr>
<tr>
<td>head to hands</td>
<td>1</td>
</tr>
<tr>
<td>hands to head</td>
<td>2</td>
</tr>
<tr>
<td>hands to body</td>
<td>1</td>
</tr>
<tr>
<td>body to hands</td>
<td>2</td>
</tr>
</tbody>
</table>

**Table:** Number of changes of zone by body part zone
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6. Some Conclusions
Some preliminary conclusions

- an argument for an onomasiological perspective
Some preliminary conclusions

- an argument for an onomasiological perspective
- the value of a formalism for description
Some preliminary conclusions

- an argument for an onomasiological perspective
- the value of a formalism for description
- subclasses of topoi:
Some preliminary conclusions

- an argument for an onomasiological perspective
- the value of a formalism for description
- subclasses of topoi:
  - DAG topoi
Some preliminary conclusions

- an argument for an onomasiological perspective
- the value of a formalism for description
- subclasses of topoi:
  - DAG topoi
  - threading topoi
Thank you!