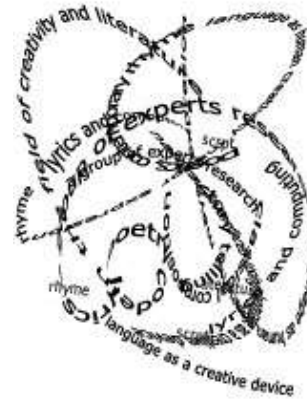# Interpreting Narrations of Events Witnessed: Relying on Location Data to Help Place Embedded Stories
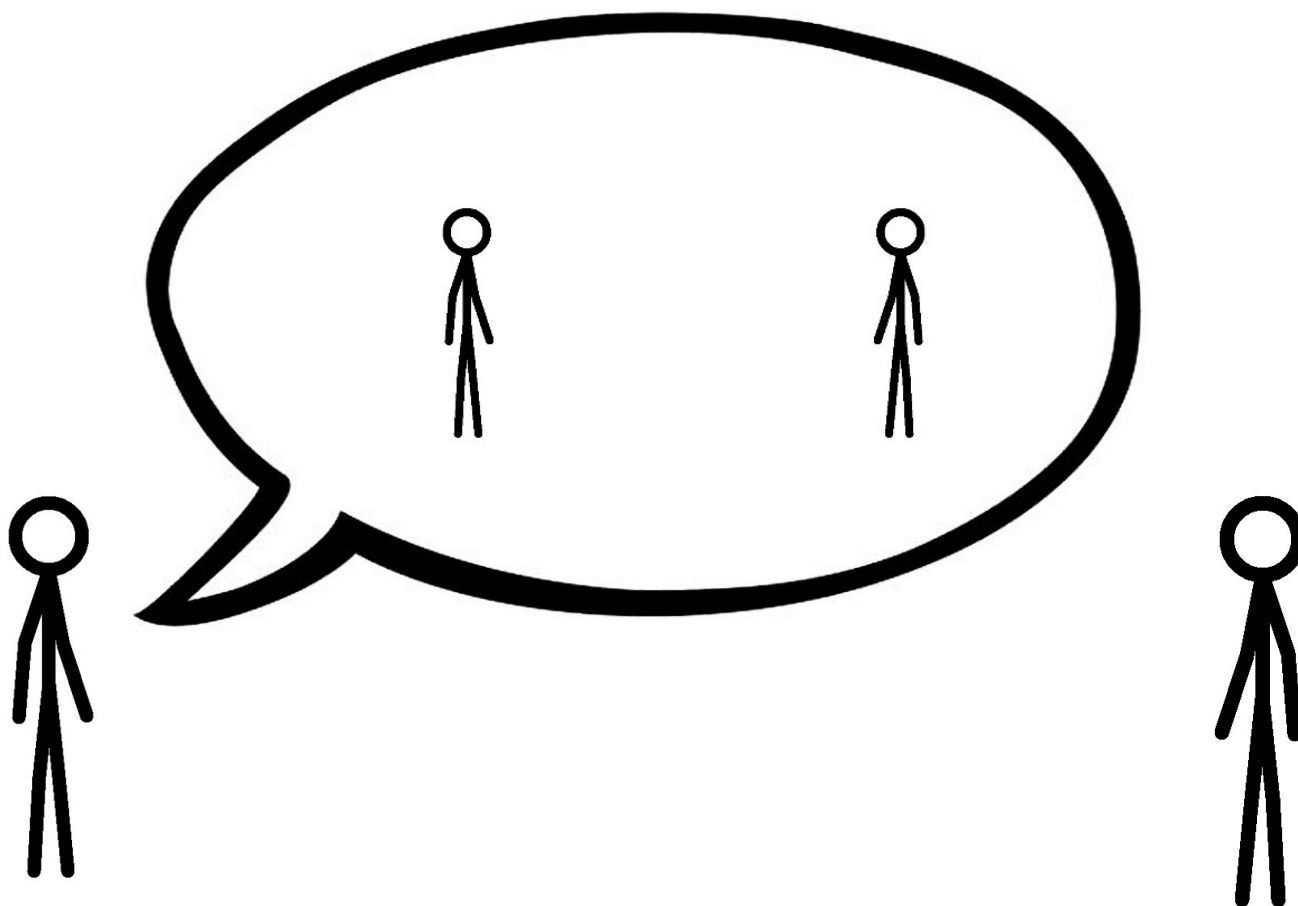
Pablo Gervás

Universidad Complutense de Madrid
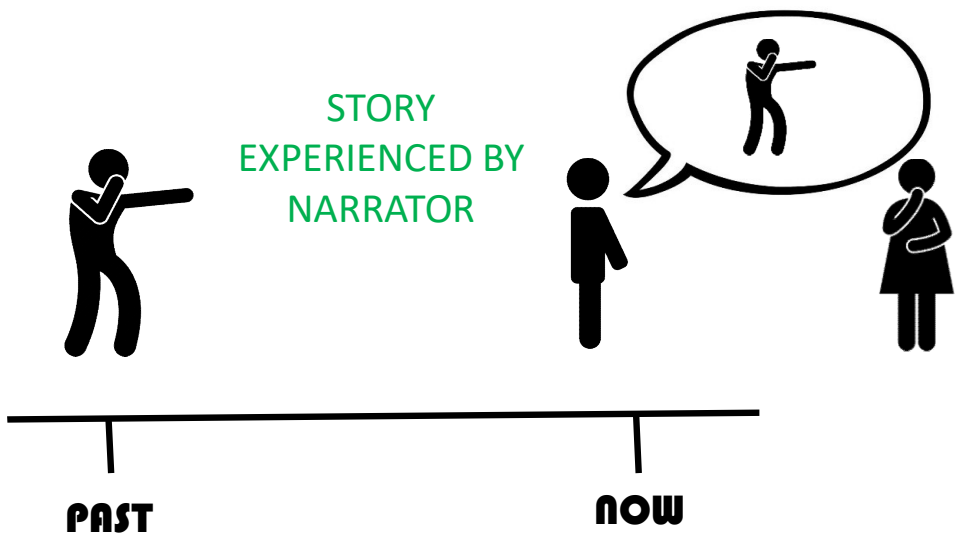
natural interaction based on language

nlL

Embedded discourse

STORY EXPERIENCED BY NARRATOR

PAST
NOW

STORY WITNESSED BY NARRATOR

PAST
NOW

PAST
NOW

PAST
NOW

PAST

NOW (1)

NOW (2)

PAST

NOW(1)

PAST

NOW(1)

NOW (2)
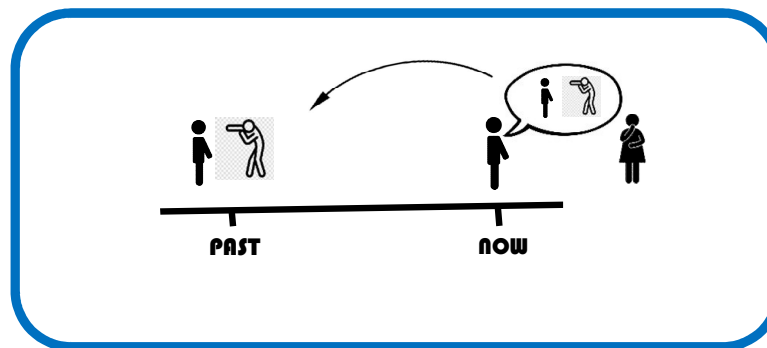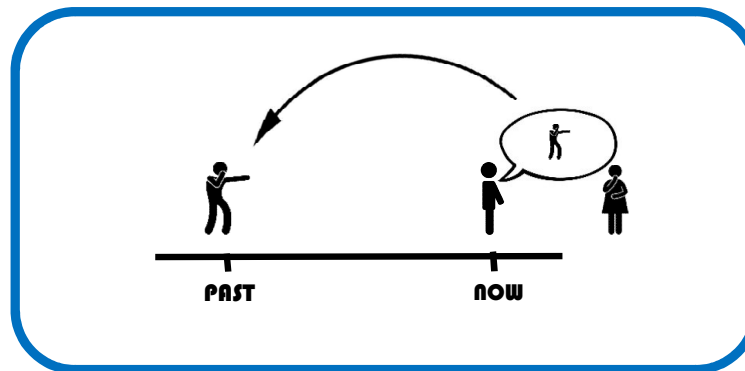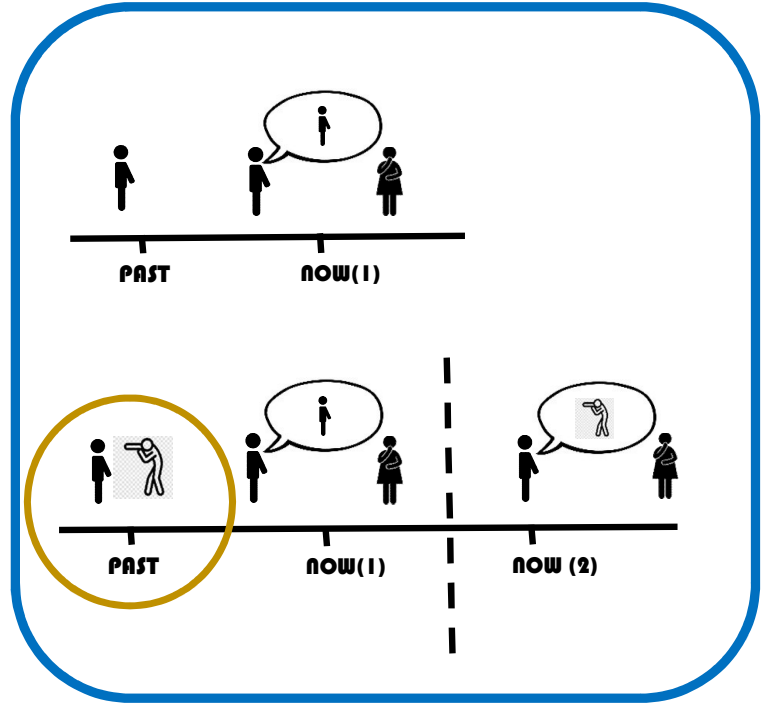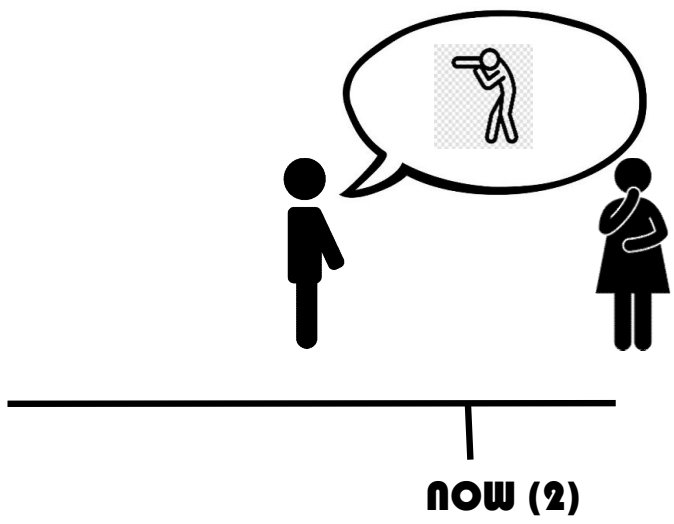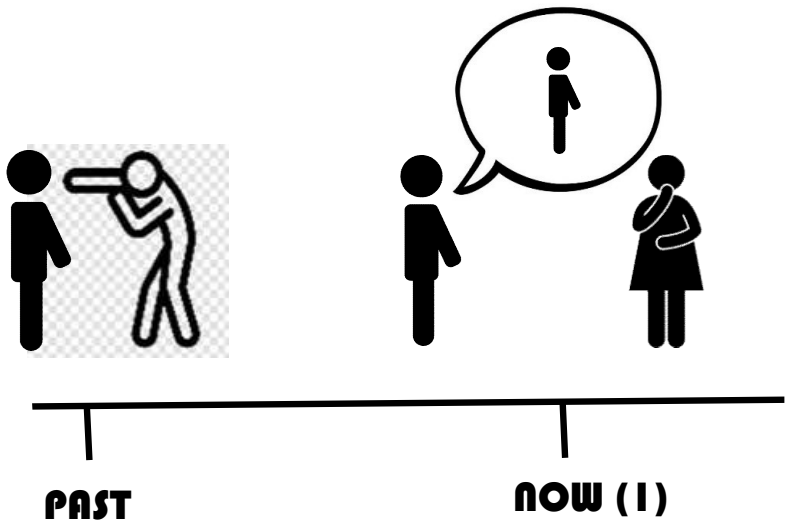
Basic algorithm for interpretting embedded stories.

- start with empty story interpretation for frame story, empty stack for initial narrative level, and empty table of embedded stories
- on start of an embedded story (`start_story <story-name>`):
    - push to stack interpretation of frame story so far
    - create new empty story interpretation for embedded story
- process updates for embedded story onto story interpretation for embedded story
- on end of embedded story (`tell_story statement <narrator> <narratee> <story-name>`):
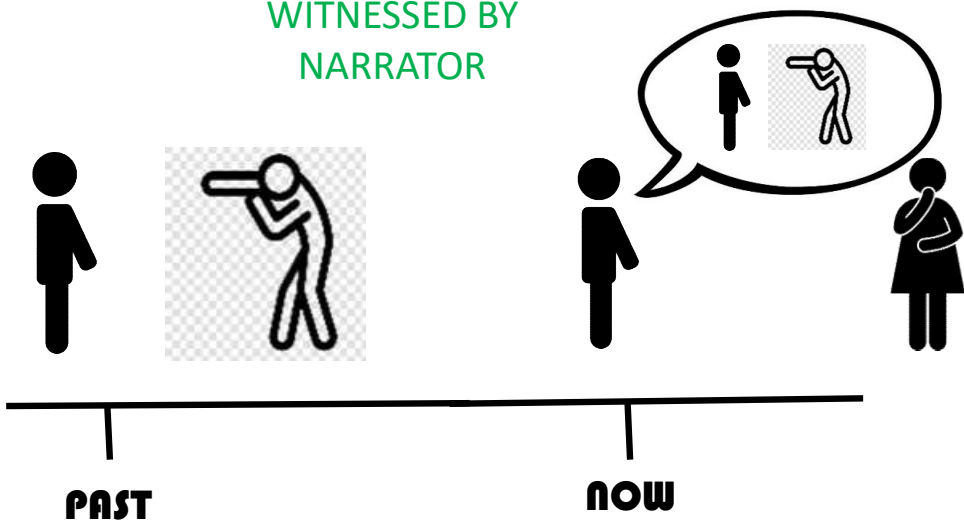   - store accumulated interpretation for embedded story in table for embedded sub-stories indexed by name of sub-story (`<story-name>`)
    - pop from stack interpretation for frame story acting as context, establish it as context for rest of frame story
    - add special `tell_story <narrator> <narratee> <story-name>` statement to interpretation of frame story to encode how telling of embedded story fits into frame story

Segmenting Discourse into Narrative Levels

interpretation   stack

finds brother3 another_kingdom

start_story princesses_abduction

kidnap dragon [princess1+princess2+princess3]

tells_a_story brother3 brother3 princesses_abduction
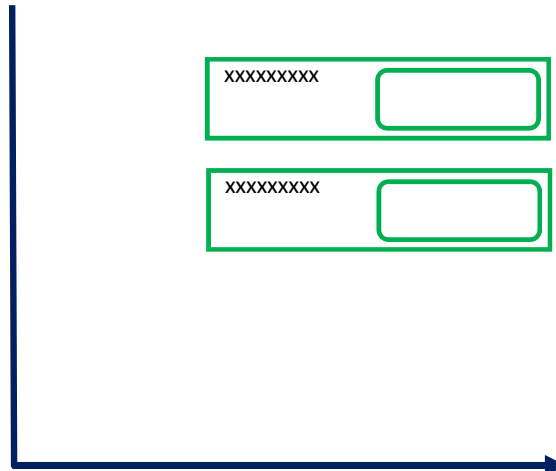
Algorithm for placing fabulae for embedded stories with respect to fabula from frame story.

- insert events from *frame story* into graph after preceding event in frame story
- on reaching embedded story:
    - if embedded story involves characters not present in frame story, mark as *unrelated story* and store separately
    - otherwise: search preceding spans of frame story for matches:
        * if match is found, mark embedded story as *conflicting story* and insert into graph before start of matching span and marked as conflicting view on events in the span
        * otherwise, mark embedded story as *preceding story* and insert into graph before start of frame story (it refers to a time before that point)

Pos.	Frame story	Pos.	Embedded story
1	sets_out brother1		
2	sets_out brother2		
3	finds brother1 kingdom		

Preceding stories	Alternatives

Frame story	Alternatives

Pos.	Frame story	Pos.	Embedded story
1	sets_out brother1		
2	sets_out brother2		
3	finds brother1 kingdom		
4	tells_story brother1 brother1 **abduction**	0	kidnap dragon princess
5	fight brother1 dragon		
6	defeats brother1 dragon		
7	releases brother1 princess		
8	gives princess brother1 ring		
9	arrives brother2 palace		
10	tells_story brother2 princess **false_claims**	0	fight brother2 dragon
		1	defeats brother2 dragon
		2	releases brother2 princess
11	asks_for princess ring		
12	gives brother1 princess1 ring		
13	recognises princess brother1		
14	exposed brother2 ∧ story_false **false_claims**		

	Preceding stories	*Alternatives*
	abduction	
0	kidnap dragon princess	
	Frame story	*Alternatives*
1	sets_out brother1	
2	sets_out brother2	
3	finds brother1 kingdom	
4	tells_story brother1 **abduction**	
5	fight brother1 dragon	*fight brother2 dragon*
6	defeats brother1 dragon	*defeats brother2 dragon*
7	releases brother1 princess	*releases brother2 princess*
8	gives princess brother1 ring	
9	arrives brother2 palace	
10	tells_story brother2 princess **false_claims**	
11	asks_for princess ring	
12	gives brother1 princess1 ring	
13	recognises princess brother1	
14	exposed brother2 ∧ story_false **false_claims**	

(…) The second brother sets out to rescue a princess kidnapped by a dragon. He fights the dragon and receives a wound in the process. He defeats the dragon. He liberates the princess. (…)

1	set_out brother destination dragonlair
2	fight brother dragon
3	wounded brother
4	defeat brother dragon
5	release brother princess
6	set_out princess destination palace

Story updates	Step 1: **WorldSnapshot**		Step 2: **Inferred Representation**		
	InitialLoc	**Destination**	loc-1	dragonlair	palace

John woke up at home and had breakfast. Then he went to school. He had a maths class in the maths classroom. He had lunch. He had an English class in the English classroom. He went to the soccer field to have soccer practice. Then he returned home. When he got home, he told his mother how Peter had released his pet rat in Maths class, the pet rat scared the teacher and Peter got punished. Then he told his mother how Mike had an accident during soccer practice, and how the coach helped Mike, who had to go to hospital.

1	at_location home wakes_up john
2	has john breakfast
3	sets_out john to_location school
4	at_location maths_classroom has john maths_class
5	has john lunch
6	at_location english_classroom has john english_class
7	sets_out john to_location soccer_field
8	has john soccer_practice
9	sets_out john to_location home
10	start_story peter_incident
11	releases peter pet_rat
12	fears teacher
13	punished peter
14	tells_a_story john mum peter_incident
15	start_story mike_incident
16	at_location soccer_field had_accident mike
17	decide_to_help coach mike
18	sets_out mike to_location hospital
19	tells_a_story john mum mike_incident

Preceding stories:

Peter's incident	Mike's incident
start_story peter_incident	start_story mike_incident
at_location maths_class	at_location soccer_field
releases peter pet_rat	had_accident mike
fears teacher	decide_to_help coach mike
punished peter	sets_out mike
	to_location hospital

Main plot line:
at_location home
wakes_up john
has john breakfast
sets_out john
to_location school
at_location maths_class
has john maths_class
has john lunch
at_location english_classroom
has john english_class
sets_out john
to_location soccer_field
has john soccer_practice
sets_out john
to_location home
tell_story john mum peter_incident
tell_story john mum mike_incident

Main plot line:
at_location home
wakes_up john
has john breakfast
sets_out john
to_location school

Main story + side story

John's maths class	Peter's incident
at_location maths_class	start_story peter_incident
has john maths_class	at_location maths_class
	releases peter pet_rat
	fears teacher
	punished peter

Main plot line (continued I):
has john lunch
at_location english_classroom
has john english_class
sets_out john
to_location soccer_field

Main story + side story

John's soccer practice	Mike's incident
has john soccer_practice	start_story mike_incident
	at_location soccer_field
	had_accident mike
	decide_to_help coach mike
	sets_out mike
	to_location hospital

Main plot line (continued II):
sets_out john
to_location home
tell_story john mum peter_incident
tell_story john mum mike_incident

Conclusions

Importance of including a construction of the physical model of the storyworld in narrative interpretation

Physical model of the storyworld can inform correct temporal placement of embedded stories with respect to the fabula for the frame story

Especially in cases where narrator of the embedded story is witness to rather than participant in the events in the story.

Algorithm proposed is a simple baseline intended to underline the importance of the task

Possible lines of future work:

   More refined heuristics for the task

   Further experiments with a wider range of examples of input stories

Thank you!

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