

Digital Heritage and Avatars of Stories

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Media annotation

- Successful efforts in access to large amounts of materials (e.g., Europeana)
- However, restricted amount of metadata (short descriptions, no contextual info)
- Abstraction of annotation



Free annotation of drama media objects in public repositories



Keyword: "North by northwest", first 100 results (41%)
299 tags, in 11 categories, 2 macro cat



Category: Film and animation
Tag: Alfred Hitchcock
North by Northwest
matchbox

Resource-based tags, 268

Title	Actor	Director	Production	Editing	Publish	Genre
68	102	28	31	28	6	5

Content-based tags, 31

Agent	Object	Environment	Action
11	9	9	2
blonde, drunk, Eva, girl, mother, Philip, police, Roger, searchers, secretary, woman	bourbon, box, dress, matchbox, peak, plane, skirt, suit, tunnel	auction, boulevard, city, Mount Rushmore, office, station, studio, sunset, waterfront	opening, driving

No interoperability of annotations. No structure/relation over tags.



Story and its avatars

- Concerning dramatic media
- Consequences for drama studies:
performance same relevance of the text
- Primary notion is the story, different texts as
avatars (Ryan), sharing dramatic qualities



Evidence from drama/narration studies

- Ryan: “story / avatars of story”
- Elam: “fabula / sujet(plot)”
- Pfister and Halliday: “different texts in different media based on one and the same story”
- UNESCO Convention for the Safeguarding of Intangible Cultural Heritage



Related work on media indexing and metadata

- Enrichment of items by retrieving descriptions and links from Wikipedia
- Automatic/manual semantic annotation of documents (e.g., MyStoryPlayer)
- Formal encoding of story elements: Story Intention Graph, single layer
- Stories ontology (with BBC), event-based, for timeline design and visualization



Our proposal

- Formal ontology on drama issues / commonsense vocabularies
- Linguistic interface for annotation
- Visualization of interpretation



Project CADMOS

Character-centred Annotation of Dramatic Media Objects

<http://cadmos.di.unito.it>



CADMOS dramatic media objects

Clips from cultural heritage



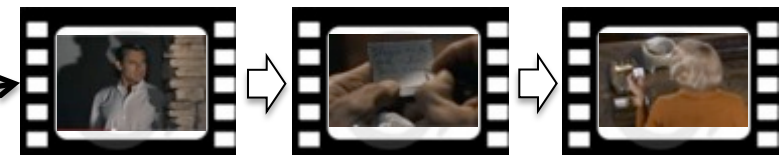
Annotation
of cultural
heritage items

DMO's from segmentation



Suddenly Thornhill glances back toward the open window, alarmed at what he HEARS -- THE FIRST FAINT DRONE OF AN APPROACHING PLANE. He looks about desperately, not knowing what to do. His eyes fall on the handkerchief still held in his hand. He sees his monogram: "ROT" on the cloth. He glances toward the doorway, and an idea is born. He feels in his side pocket and takes out a match folder. (In an INSERT, we see that the match folder is the same one he and Eva discussed at dinner on the train. It bears his personal trademark: ROT.) He takes a pen from his pocket, opens the match folder and writes a message on the inside of the cover: "THEY'RE ON TO YOU! COME UP TO YOUR ROOM!" He closes the folder, goes to the doorway and moves cautiously out to the balcony.

Filling the
semantic gap
in production



DMO's from production

Screenplay for production



CADMOS structured annotation

- Characters/agents with structured goals and actions
- Objects involved and Unintentional events



Agent: **Hamlet**

Agent: **Ophelia**

Object1: **arrangement**
Polonius-Ophelia

Object2: **message1**
"Where is your father?"

Object3: **Polonius' room**

Location: **interior**

Place: **A room in the castle**

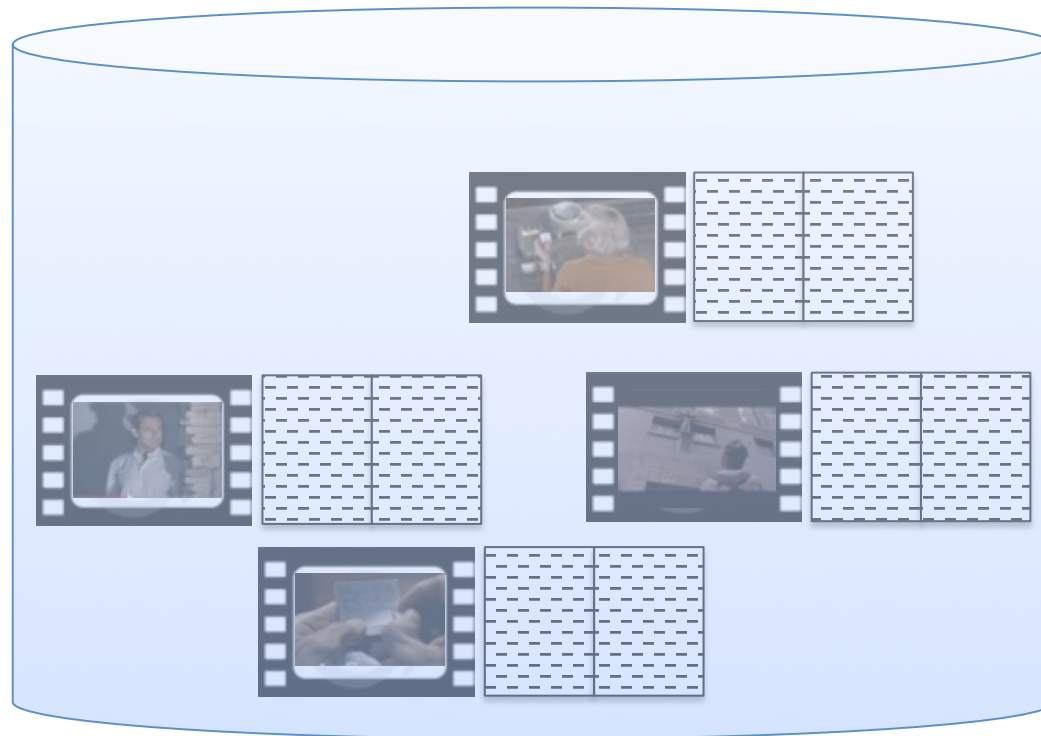
Goal: **Hamlet wants**
Ophelia to confess the
arrangement with Polonius

Action: **testing**
Speaker/**Hamlet**
Addressee/**Ophelia**
Topic/**Object1**
Message/**Object2**

Semantic structure in CADMOS



CADMOS annotated repository of videos





CADMOS impacts

Agent: **Roger**

Goal: **warn**

WHOM/**Eve**

Action: **write**

TEXT/**message**

ADDRESSEE/**Eve**

MEDIUM/**matchbook**

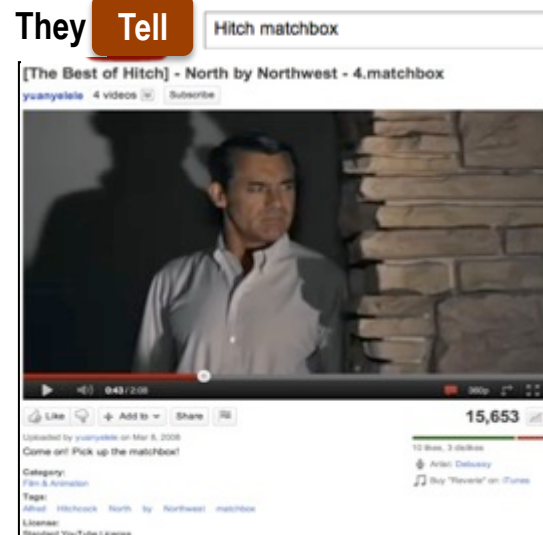
Knowledge
acquisition of
libraries of
agents' plans



Automatic segmentation
of drama units



Advanced search of units
Cultural heritage exploitation



Automatic storyboarding
and previsualization



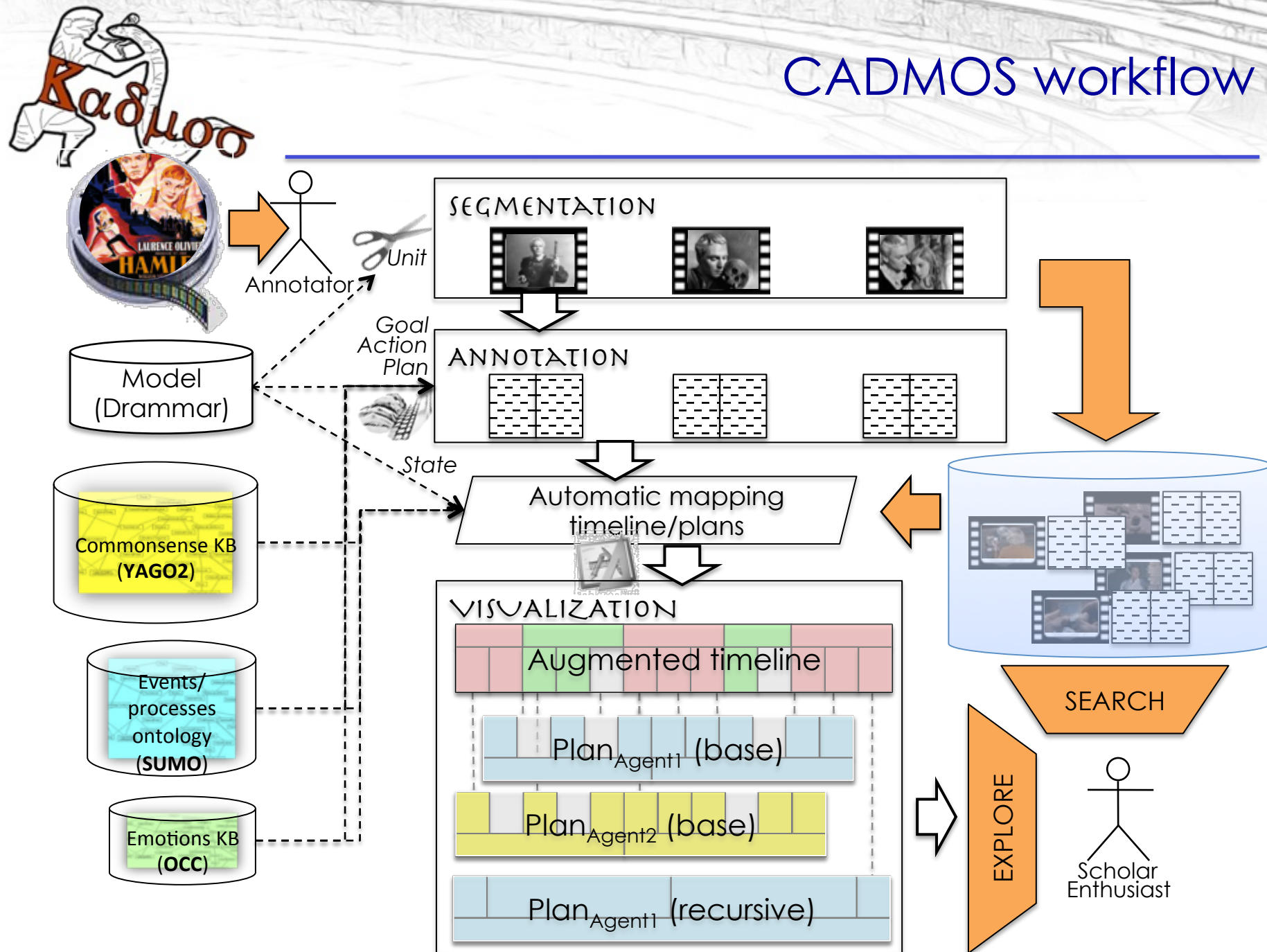
Re-use of segments





The CADMOS approach

CADMOS workflow

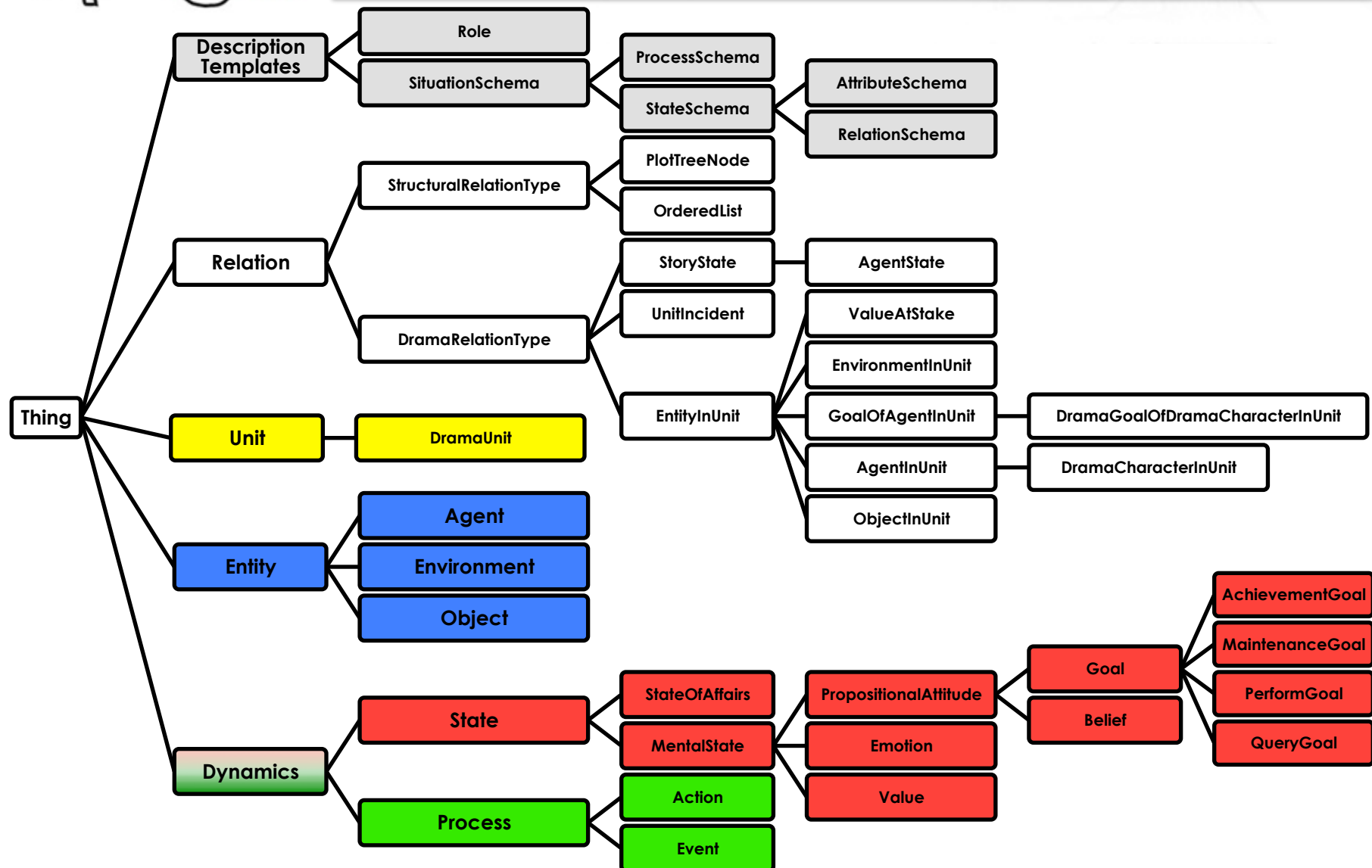




Ontology-based annotation schema

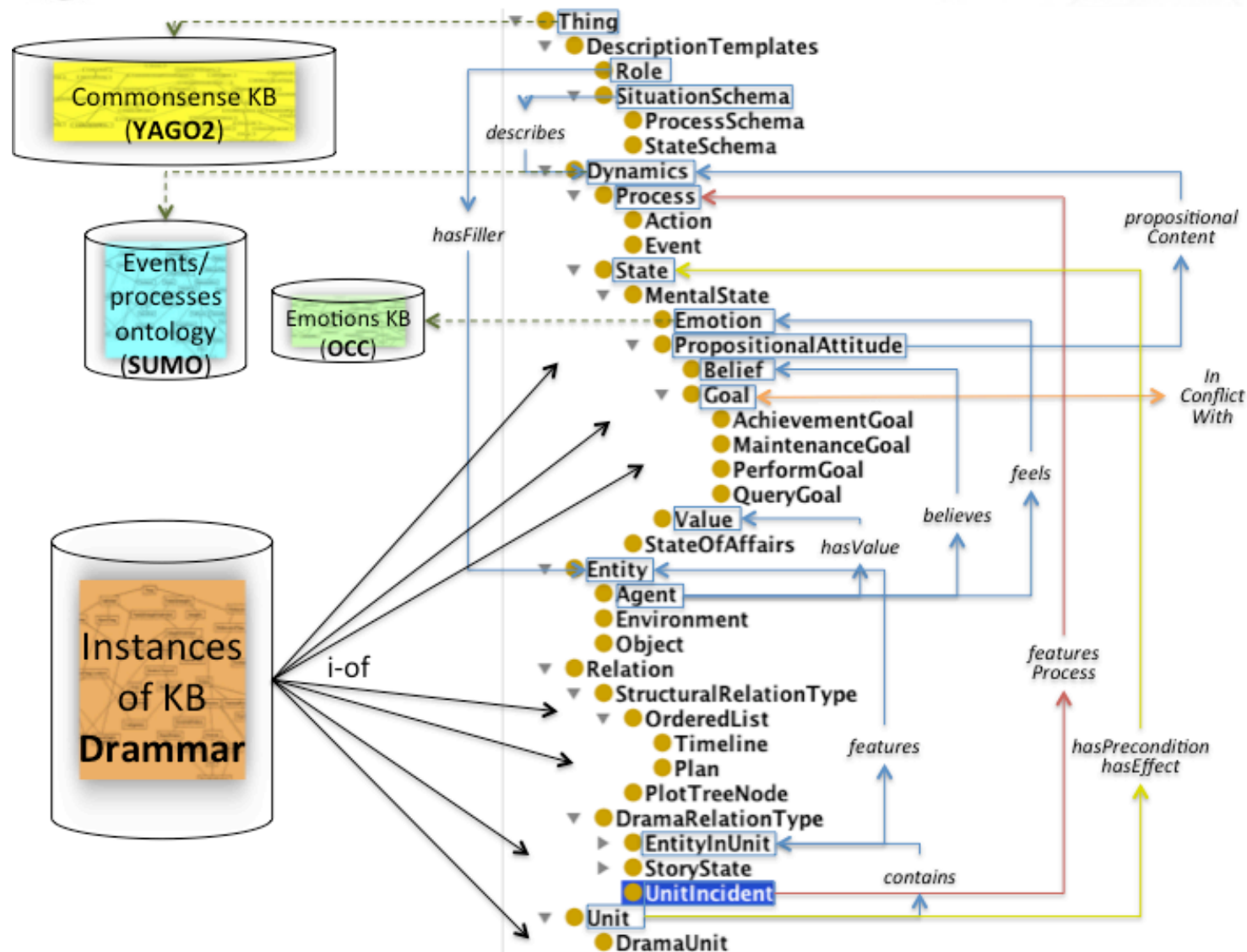


The drama ontology DRAMMAR: subclass relations



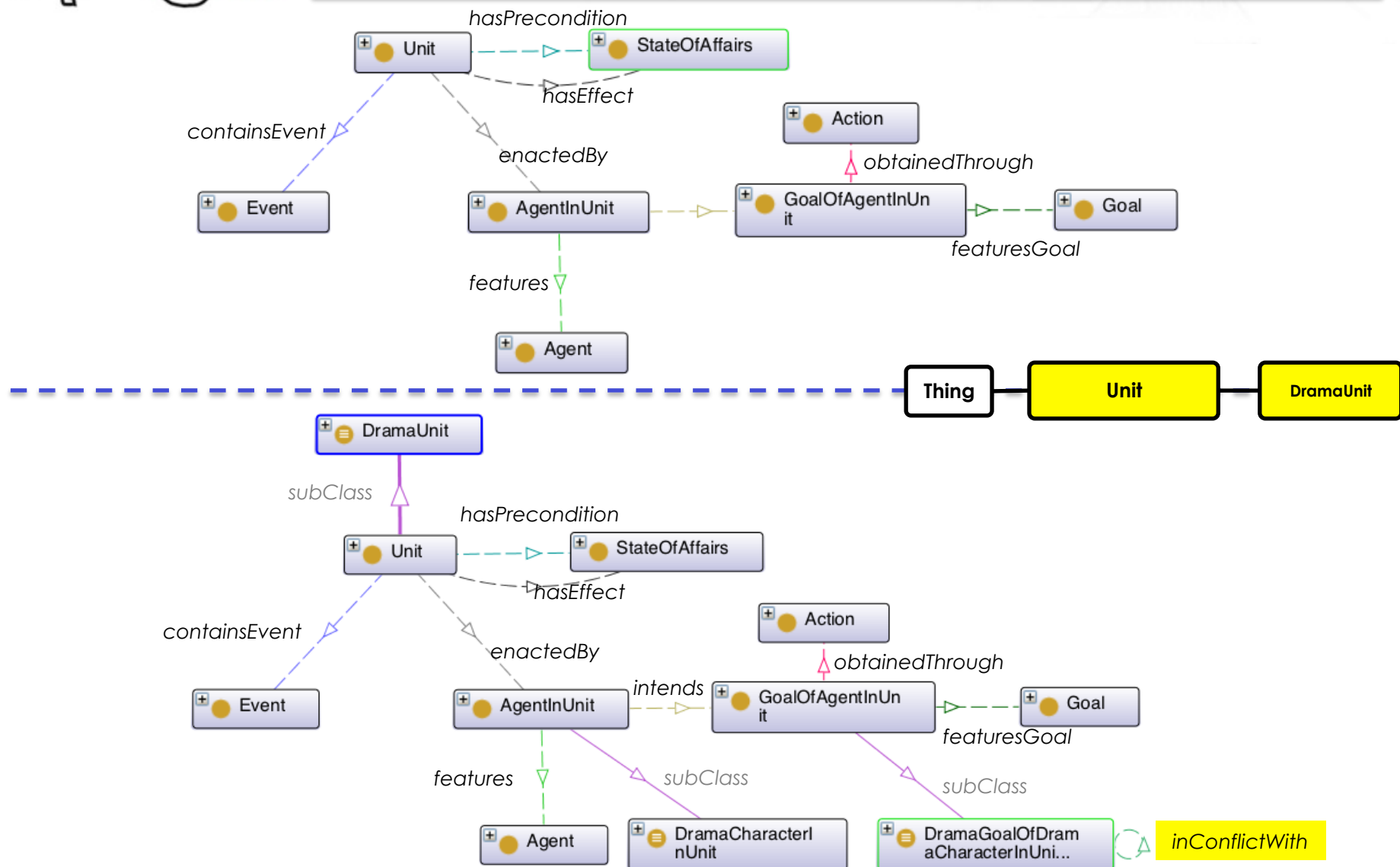


Drammar: classes, instances, relations, external KB's





Drammar properties: Units and Drama units





Example Nunnery scene Hamlet, Act 3, Scene 1





CADMOS segmentation

Project ▾ DMO ▾ Unit ▾ Structure ▾ Administration ▾ Help Disconnect Prova Pizzo Unit: Ophelia tries to return gifts

Units: Ophelia tries to return gifts Save Unit

Generics Agents Actions Objects Environments Events States M-e-s

Generics

Unit Name: Ophelia tries to return gifts

Free comment:

Description: Nunnery scene

Tags: inery, Hamlet, Ophelia, gifts

DMO: All Hamlet_Nunnery_DMO_03_giftReturn Bound
Hamlet_Nunnery_DMO_03_g

Creator:

Publisher:

Part of Clip: Amleto e Ofelia

Start At 114 Stop At 157 00:01:54

Generics Agents Actions Objects Environments Events States M-e-s Search Unit

Work Area

Chiudi

Work Area

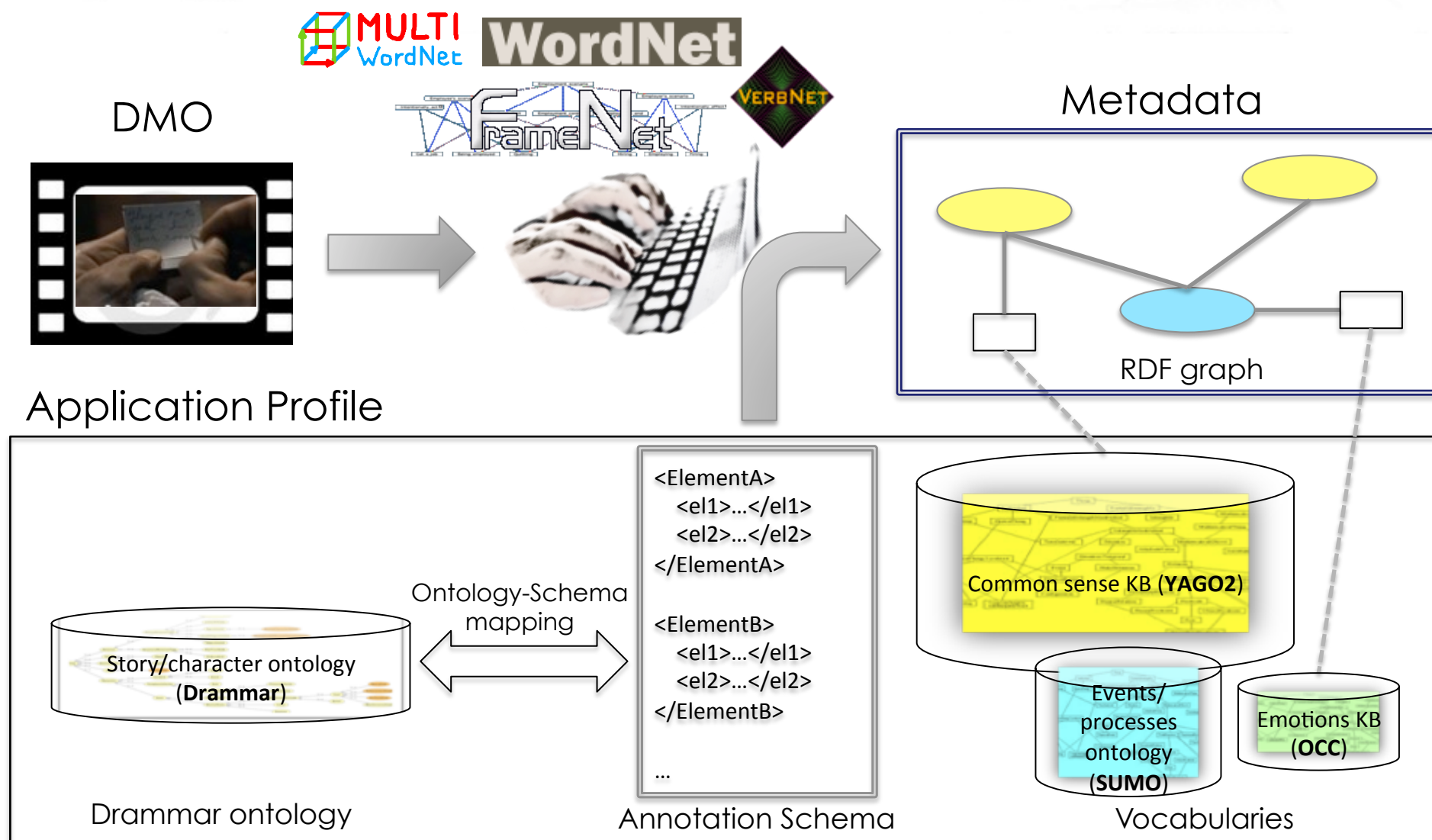
Expand Work Area

Open Imported



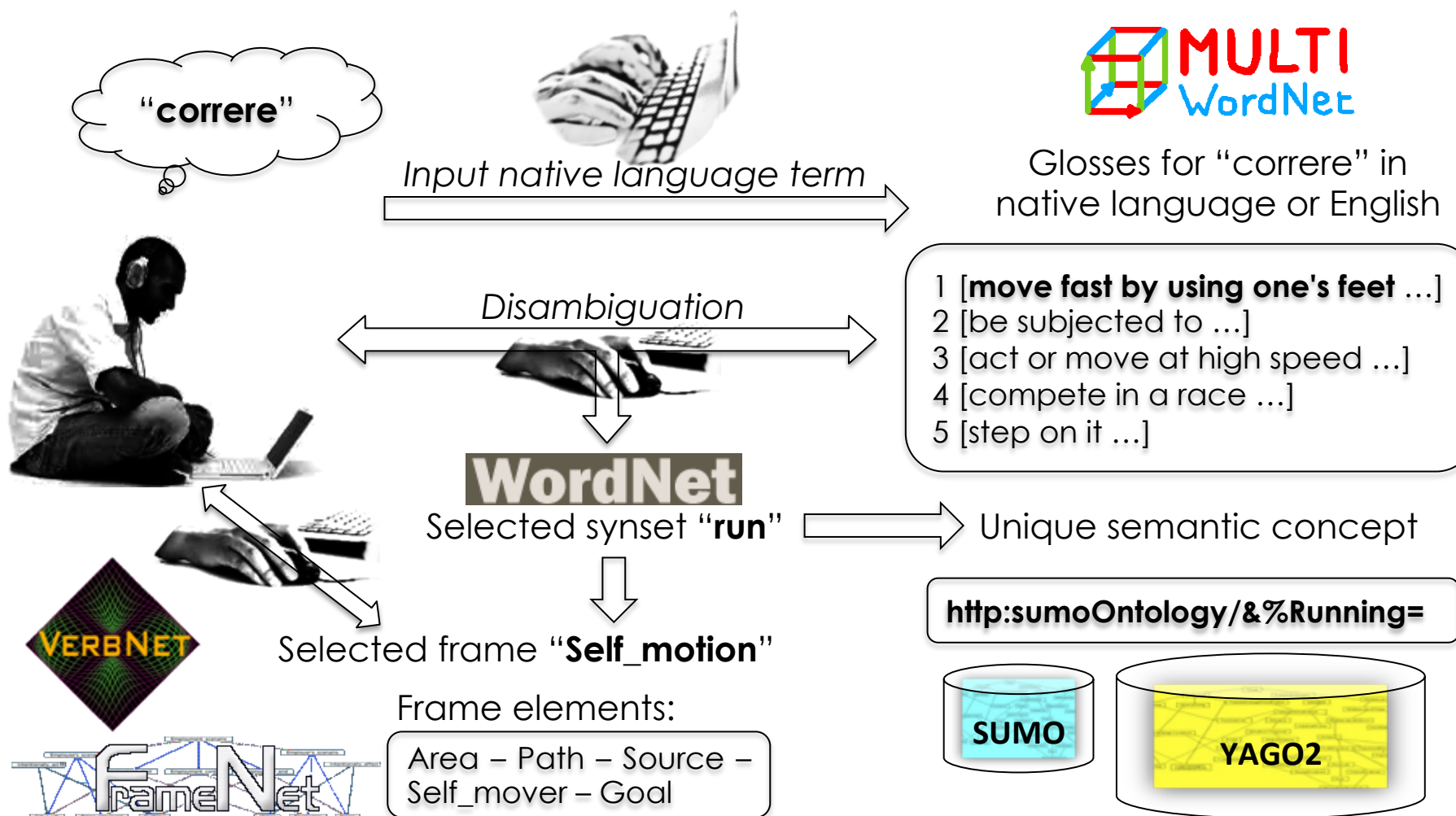
CADMOS Annotation

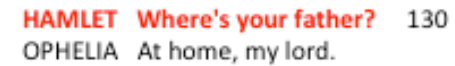
Linked data via URI's of external KB's





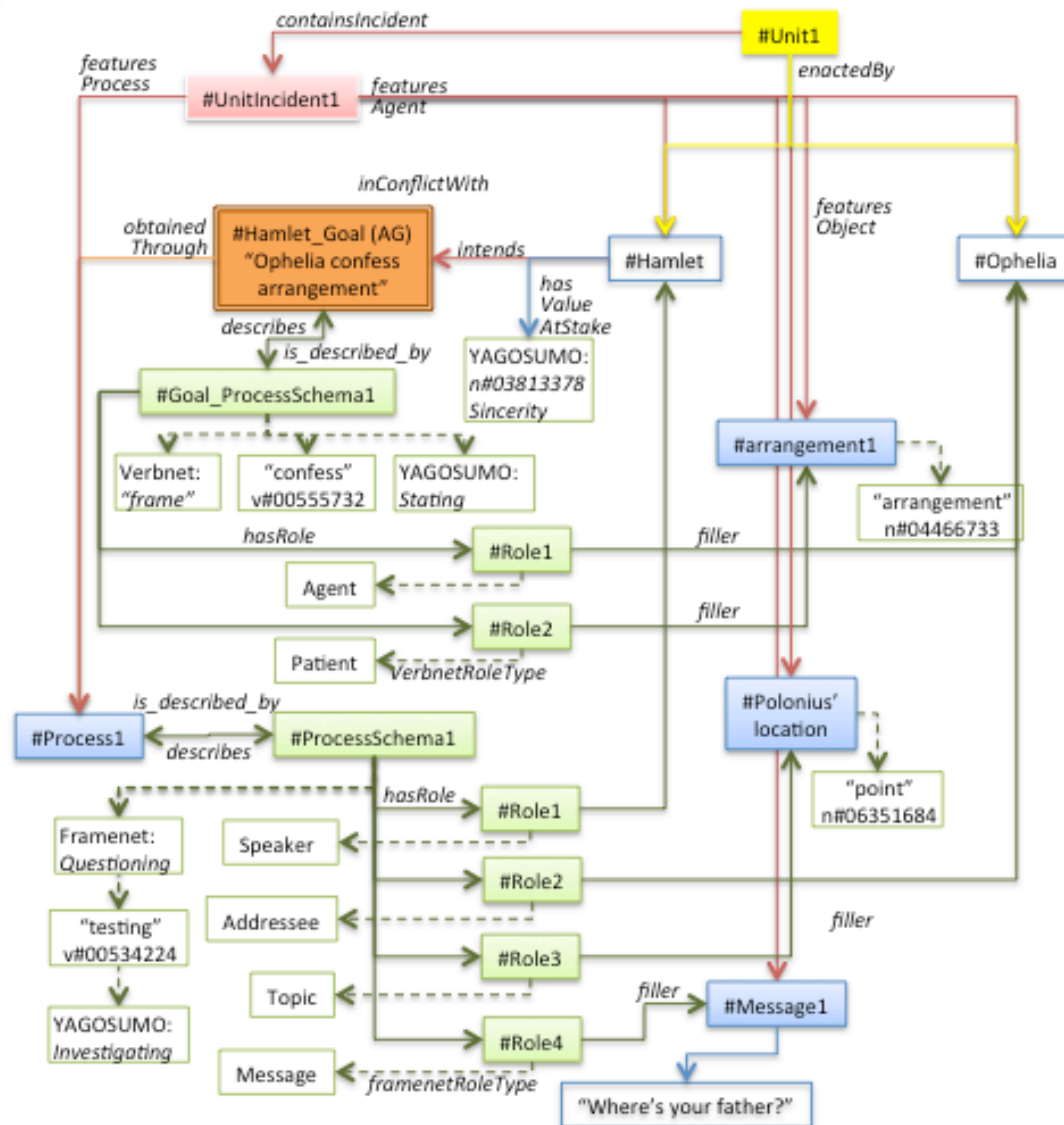
Linguistic interface for annotation



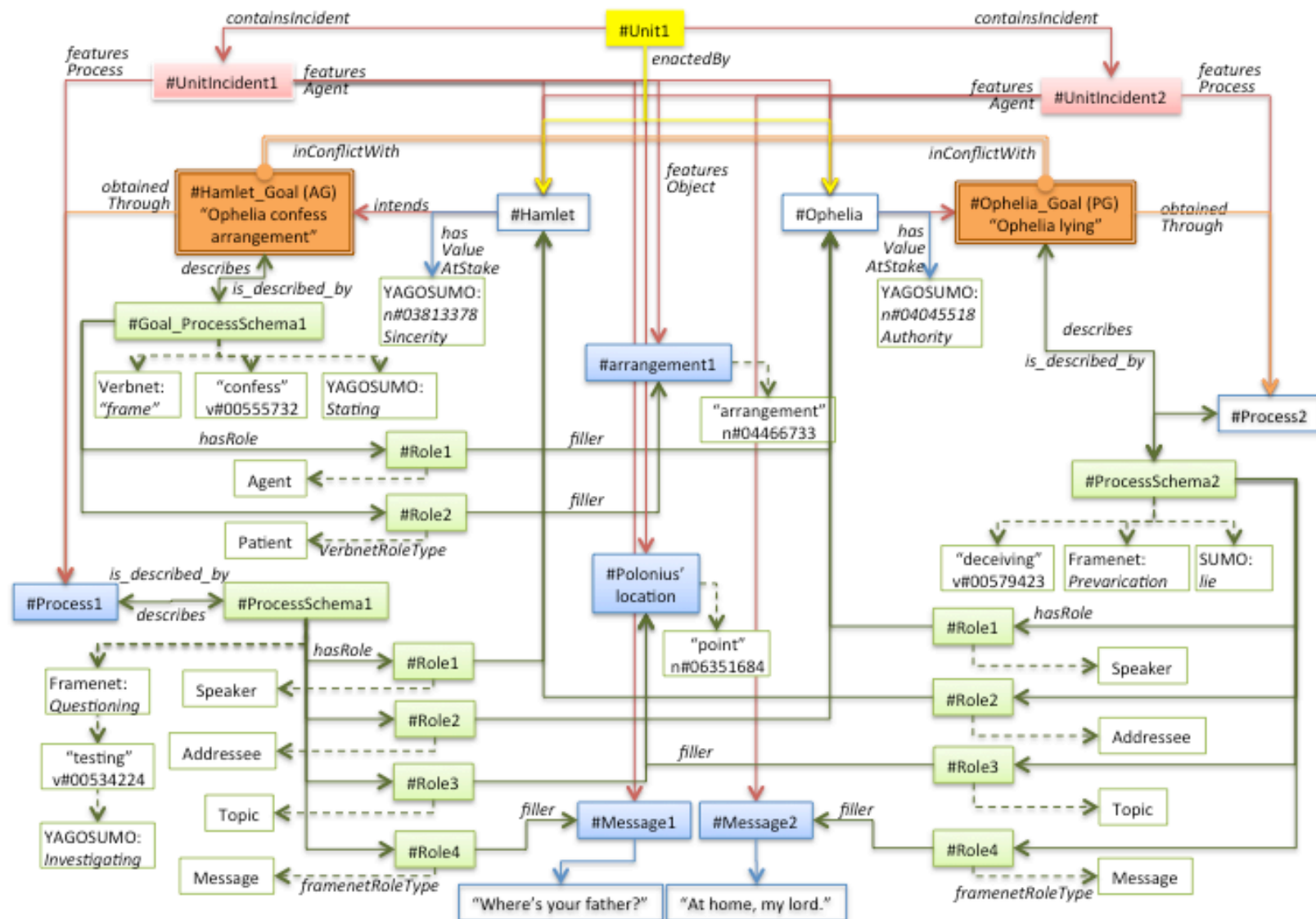
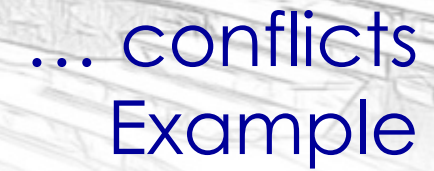


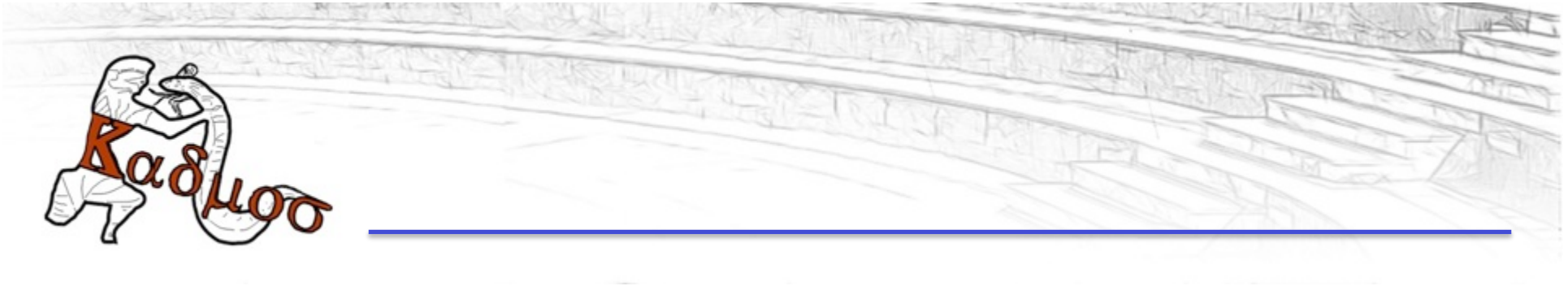


... goals, ... Example



HAMLET Where's your father? 130
OPHELIA At home, my lord.





Mapping

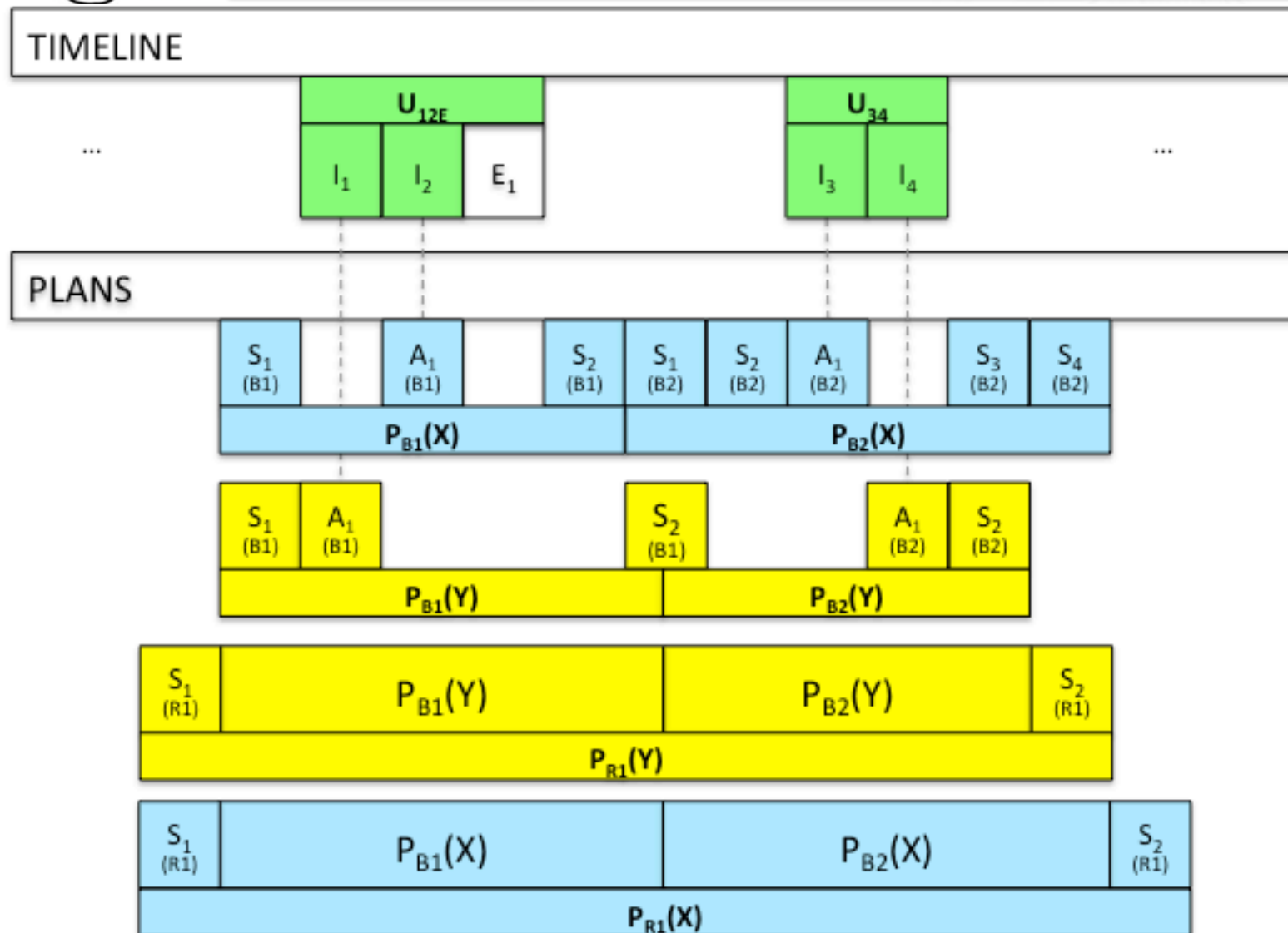


Plans and timelines

- Annotators record units, agents, objects, goals, actions, ... observed in the media
- Scholars / annotators work on agents' plans, to provide motivations
- Automatic mapping plans/timeline for displaying the coherence of the annotation



Mapping incidents, actions, plans





Example of plan

```
<plan id="P_H_007" ... print="Hamlet wants Ophelia to confess her plot with Polonius">  
  <sa id="B_0009" ... print="Hamlet believes Polonius is in the Room"></sa>  
  
  <sa id="A_ask_01" ... print="Hamlet asking Ophelia Where is your father"></sa>  
  <sa id="A_neg_03" ... print="Ophelia lying about Polonius"></sa>  
  
  <sa id="B_0010" ... print="Hamlet believes Ophelia lied about Polonius"></sa>  
</plan>
```




The mapping loop

Initialize Augmented Timeline to Timeline

Loop

 Matching

 incidents/plans in the Timeline

 to actions/subplans in the Plans

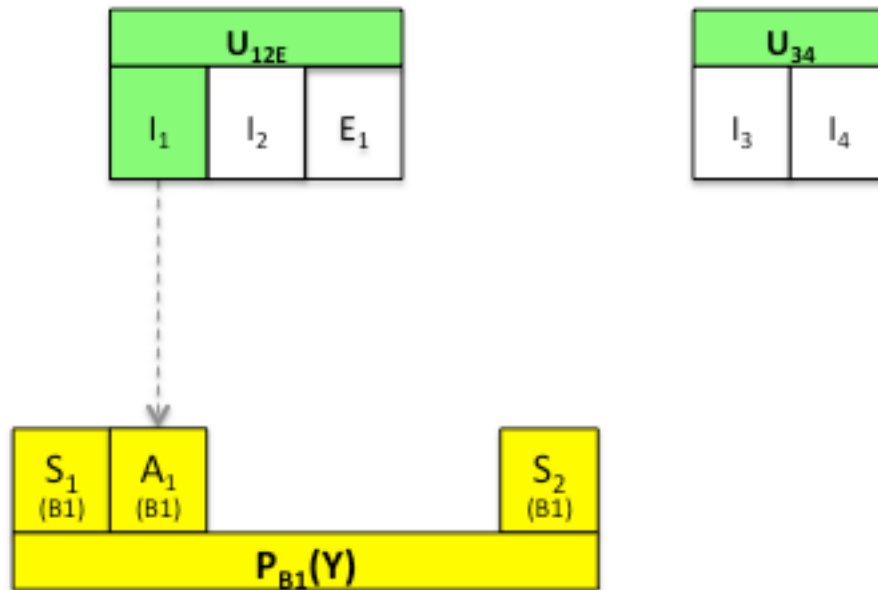
 Projecting states onto the Augmented Timeline

Return Augmented Timeline and matches

Implemented via
 Semantic relations in Ontology
 SWRL rules

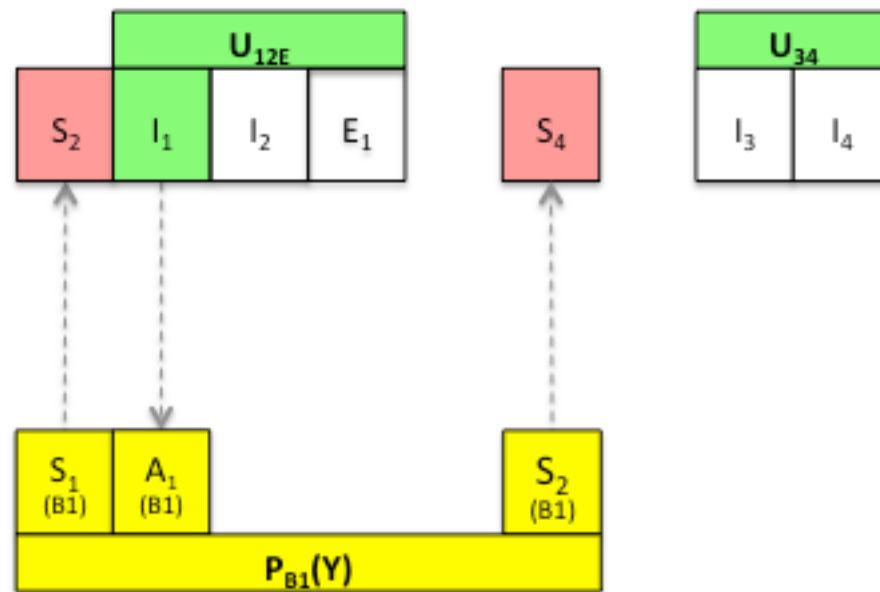


Mapping step by step (1)



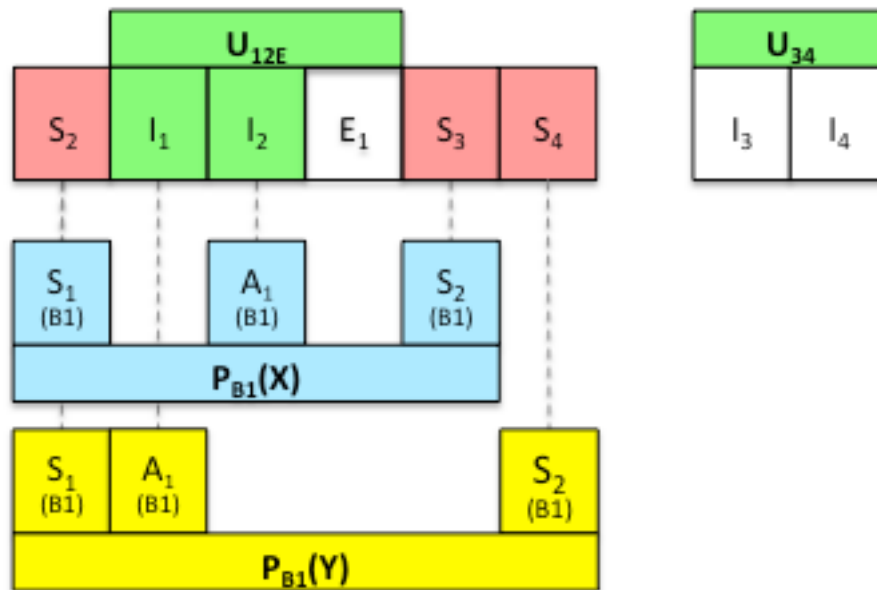


Mapping step by step (2)



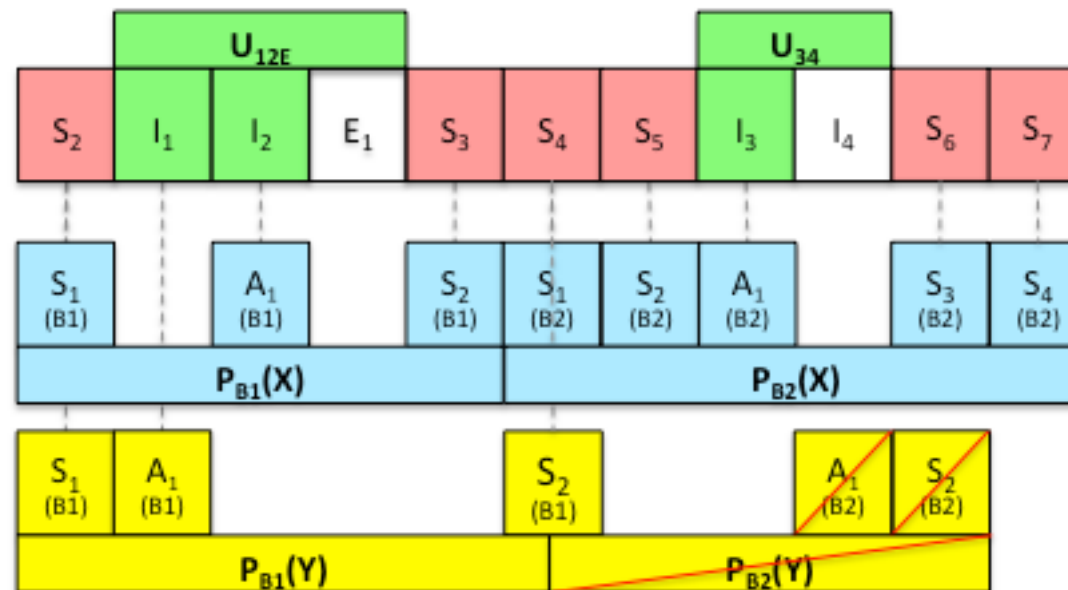


Mapping step by step (3)



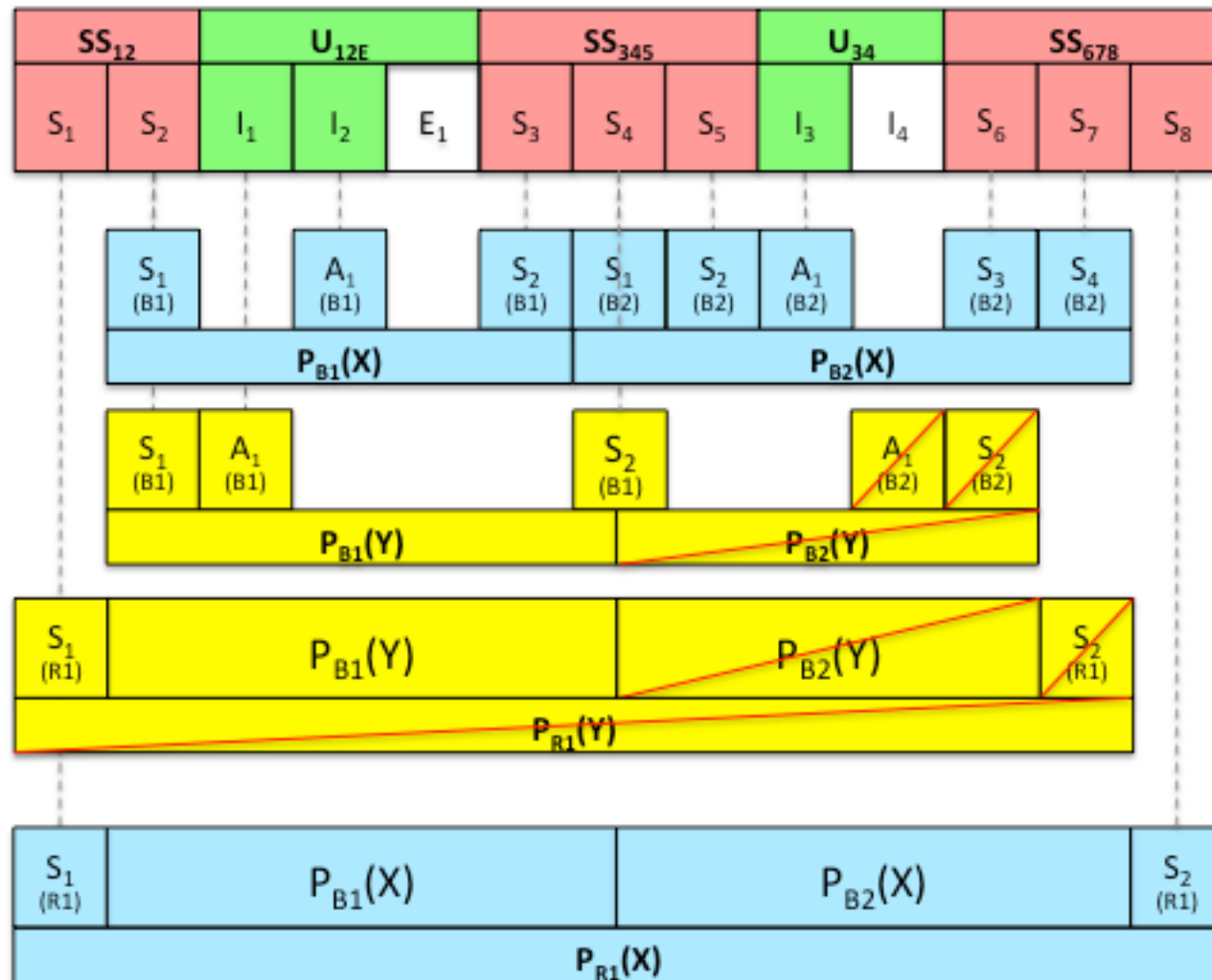


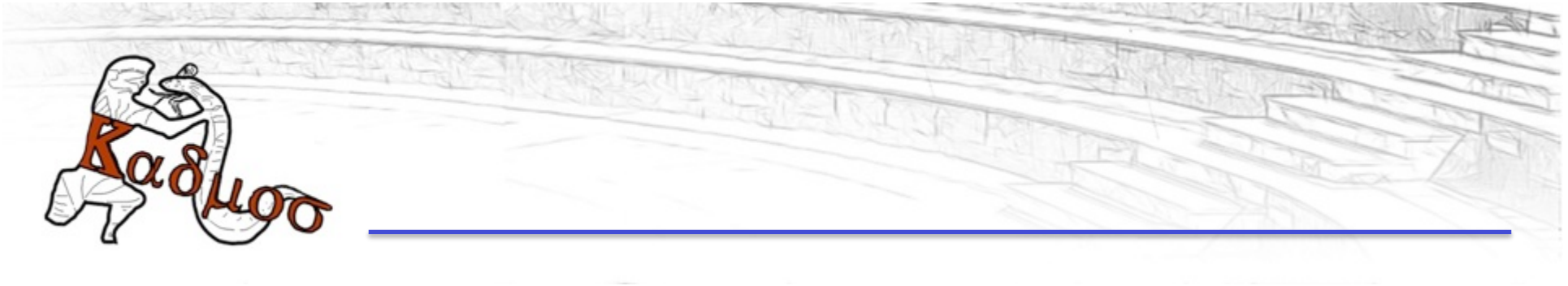
Mapping step by step (4) Mapping all base plans, one fails





Mapping step by step (5) Mapping recursive plans, higher fails





Visualization



Visualization algorithm

- Bottom up approach: from base to recursive plans
- Horizontal alignment for action/incidents and plans/subplans
- Vertical arrangement of layers

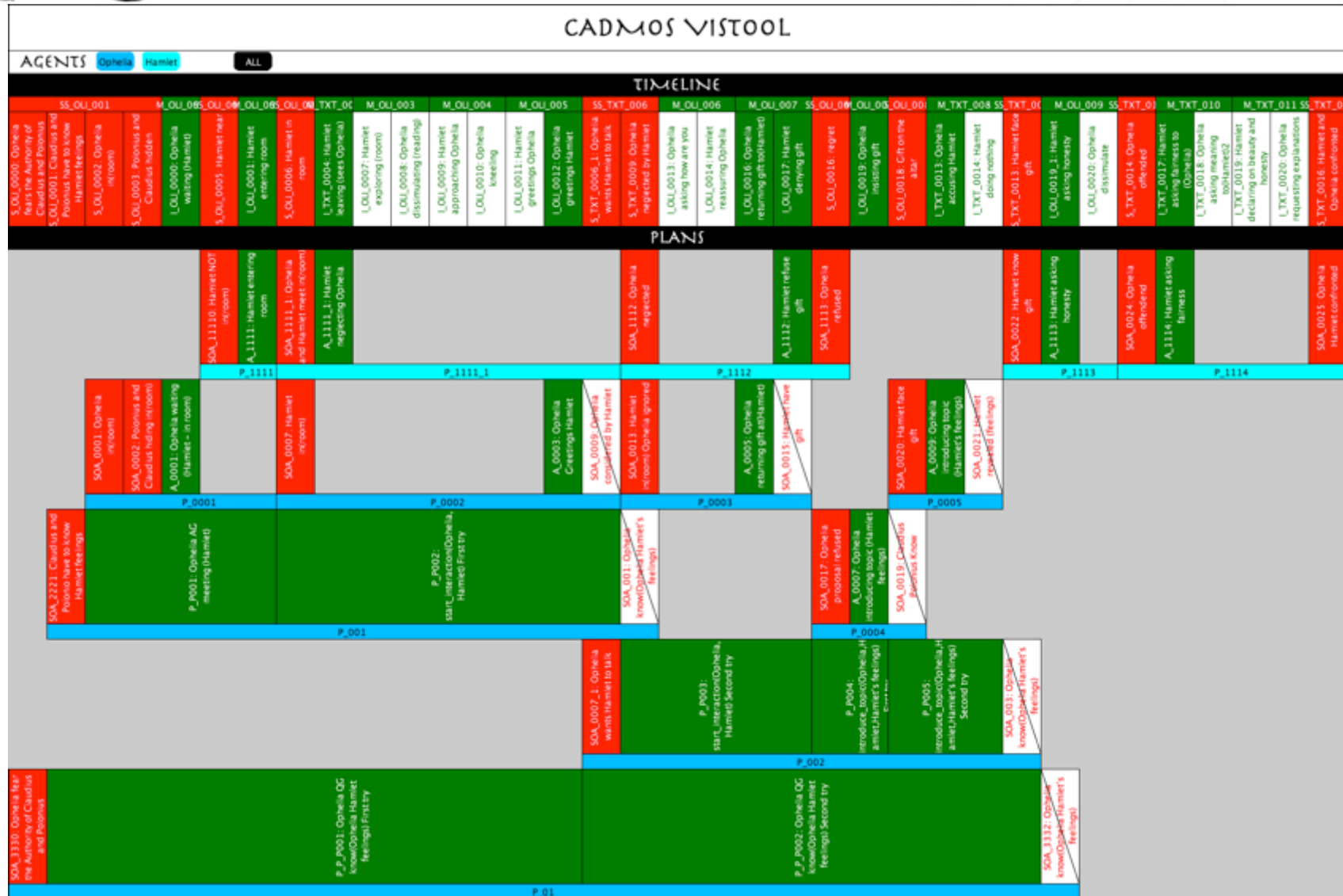


Visualization algorithm

- Implemented in Processing
- Input: XML file for timeline and plans + mapping
- Output: Static image or interactive visual
- Developing implementation in D3



Example





Evaluation issues



Qualitative evaluation

- Current areas
 - Teaching drama authoring and analysis
 - Research on drama analysis
- Future areas
 - Production



Fleshing out the dramaturgy of the performance

- Connect dramatic qualities to actions displayed on screen/stage
- CADMOS visualization
 - bridges gap between script and performance
 - shows how performance re-shapes the dramaturgy
- Agents' plans mapping timeline incidents
 - The more successful mappings, the more the narrative text of dramatic medium is bounded to character's deliberation





Orchestration of conflicts

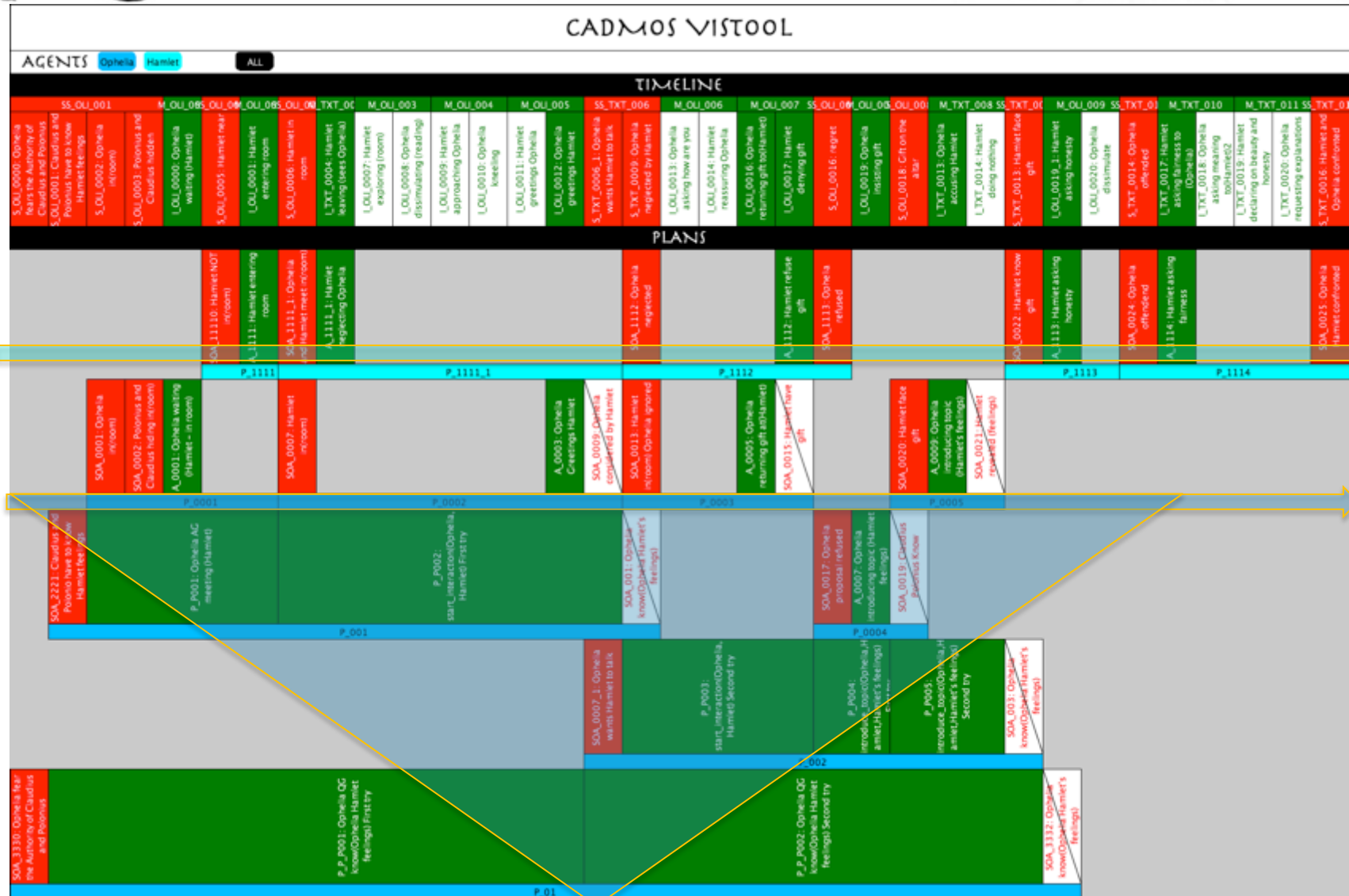
- Conflicts are the essence of drama
- Conflicts easily detected in the visualization
 - the stratification of agents plans that insist in mapping the same portion of the timeline
 - orchestration of conflicts and their synchronic execution on the vertical dimension

[illegible]



Character change

- The hierarchy/sequence of plans, both successful and failed reveal the characters' changes
- Character is key figure into the emotional engagement of the audience
- Visualization of successful and failed plans





Equivocals

CADMOS VISTOOL

AGENTS

Man

Brother

ALL

TIMELINE

SS_03	M_03	SS_04	M_04	SS_05	M_05	SS_06
S_03_2: Brother believes [SOA: Truck broken]	S_03_3: Truck broken	L_03: Man requesting_help	S_04_1: Man confident	S_04_2: Brother considers Man Victim	L_04: Brother stopping Car	S_05_1: Car stopped
S_05_2: Man believes [SOA: Brother willing]	L_05_1: Brother leaving with(Car)	L_05_2: Girlfriend awaking in(Car)	S_06: Man believes [SOA: Brother unwilling]			
PLANS						
B_04_05_1: Brother believes [SOA: Truck broken]		B_04_05_2: Brother considers Man Victim	A_04_05_1: Brother stopping Car	S_04_05_03: Car stopped	A_04_05_2: Brother leaving with(Car)	B_04_05_3: Man believes [SOA: Brother unwilling]
Brother AG making_joke to(Man) with(Car)						
SOA_03_04_1: Truck broken	A_03_04_1: Man requesting_help	SOA_03_04_2: Man confident	A_03_04_2: Driver responding	B_03_04: Man believes [SOA: Brother willing]	A_03_04_3: Man Driver fixing Truck	SOA_03_04_3: Truck fixed
Man AG fix Truck with(Driver)						





To be done

- Current status: prototype
- Ontology: to be polished and published
- Annotation: Populate the annotated repository
- Mapping: Working with non instantiated plans
- Visualization: interactivity with large structures
- Quantitative evaluation model



Conclusions

- Manual annotation of drama through agents' motivations and actions
- Vocabularies from very large scale, shared, commonsense ontologies
- Ontological terms accessed through a multi-lingual NL interface
- Visualization tool for exploring/navigating the drama structure



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visit

<http://cadmos.di.unito.it>