

Tatiana

Trace Analysis Tool for Interaction Analysts

Gregory Dyke, Ecole des Mines de Saint-Etienne

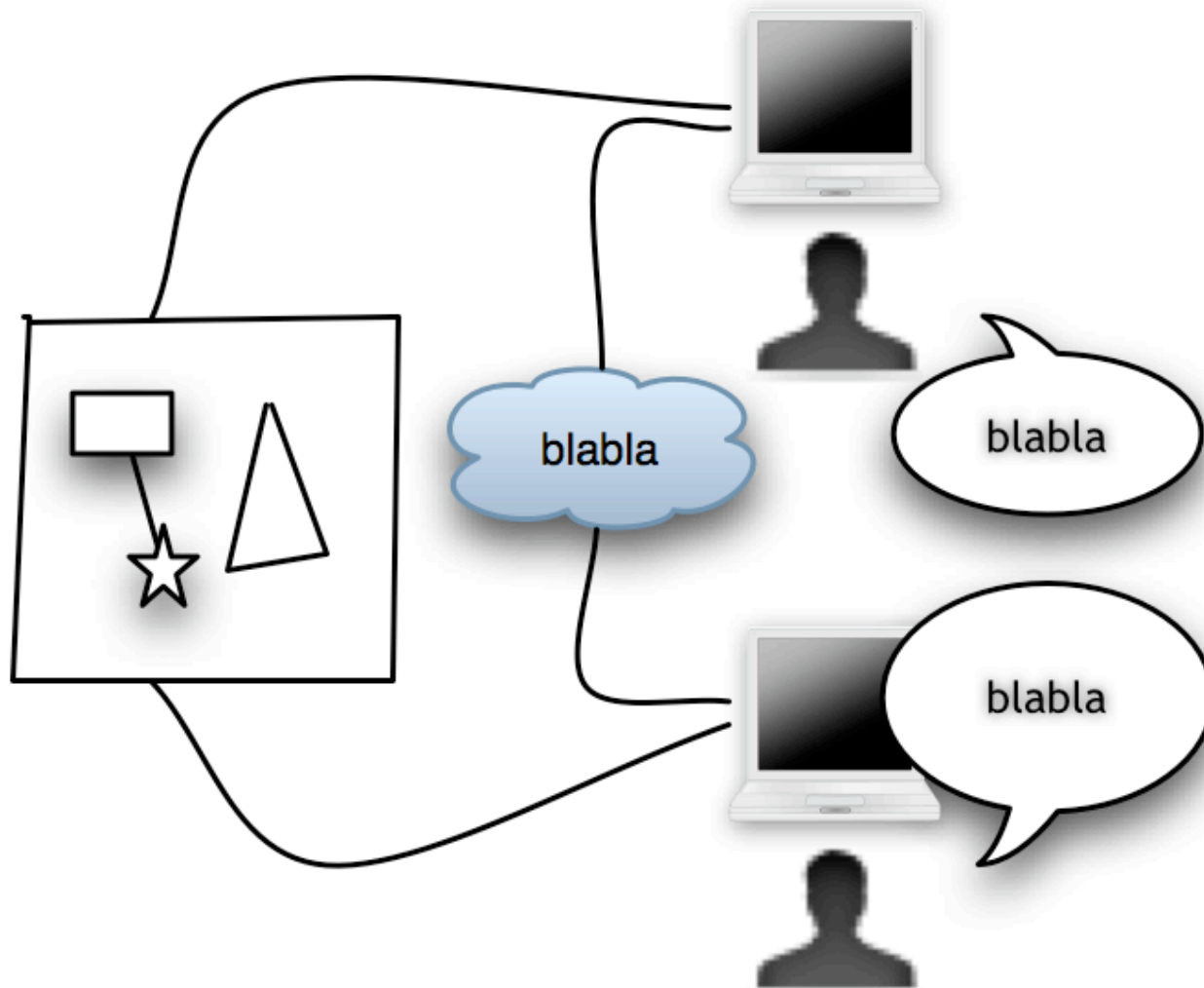
Kristine Lund, umr ICAR, CNRS, Université de Lyon)

Jean-Jacques Girardot, Ecole des Mines de Saint-Etienne

Contents

1. Presentation of Tatiana
 1. Context - why is analysis difficult?
 2. Artefacts created by researchers
 3. Example of such artefacts in Tatiana
 4. Global overview of the model behind Tatiana
2. Two perspectives on analysis
 1. Social Sciences
 2. Computer Science

Multimedia and Multimodality



How do you record this?
How do you analyse the recording?

Complex data formats

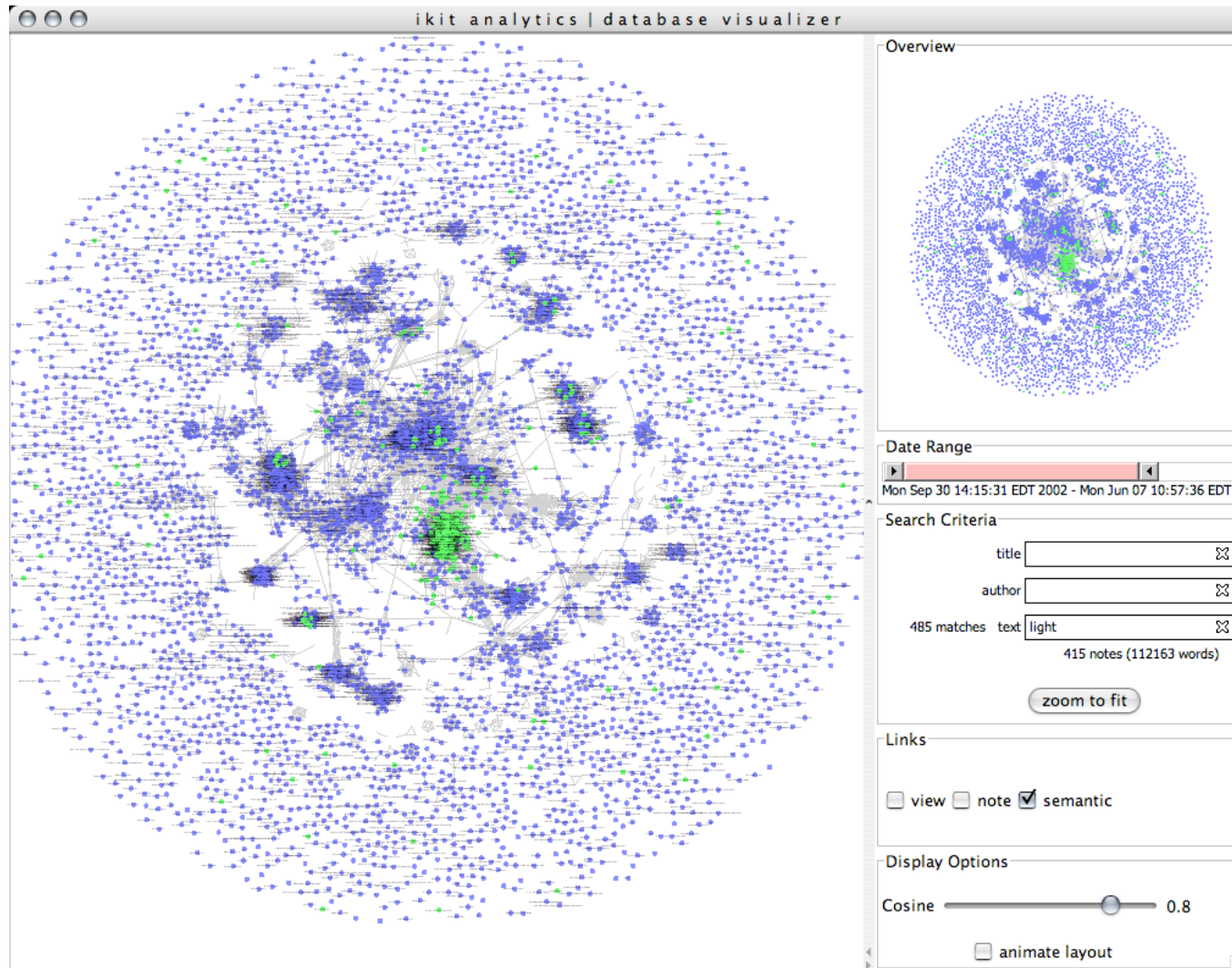
```
ark="http test step 1" user="jj" room="Hall"><time><date>1193316177005</date></time><server><connection state:
lall"/><type event="room"/><subject>trace.utf8</subject><language lang="en"/></connection></server></event>
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ark="http test step 1" user="Armand" room="Hall"><time><date>1193316233077</date></time><server><connectio
lall"/><type event="room"/><subject>trace.utf8</subject><language lang="en"/></connection></server></event>
ark="http test step 1" user="Armand" room="Hall"><time><date>1193316233206</date></time><server><syn/></se
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lall"/><type event="room"/><subject>trace.utf8</subject><language lang="en"/></connection></server></event>
ark="http test step 1" user="francois" room="Hall"><time><date>1193316235722</date></time><server><syn/></se
ark="http test step 1" user="jj" room="Hall"><time><date>1193316239320</date></time><server><list/></server></ε
ark="http test step 1" user="Armand" room="Hall"><time><date>1193316259964</date></time><textboard><text lar
```

Much better to understand once parsed ?

User	Message	Time
Cedric	2 characters added near he	10:20:40
Romain	3 characters added near good	10:20:43
Cedric	1 character removed near h	10:20:50
Romain	2 characters added near goodbye	10:21:07
Cedric	2 characters added near hi	10:21:22
Romain	1 characters added near goodbye	10:21:42
Cedric	3 characters added near hi all	10:21:51
Cedric	1 character added near hi all!	10:21:51

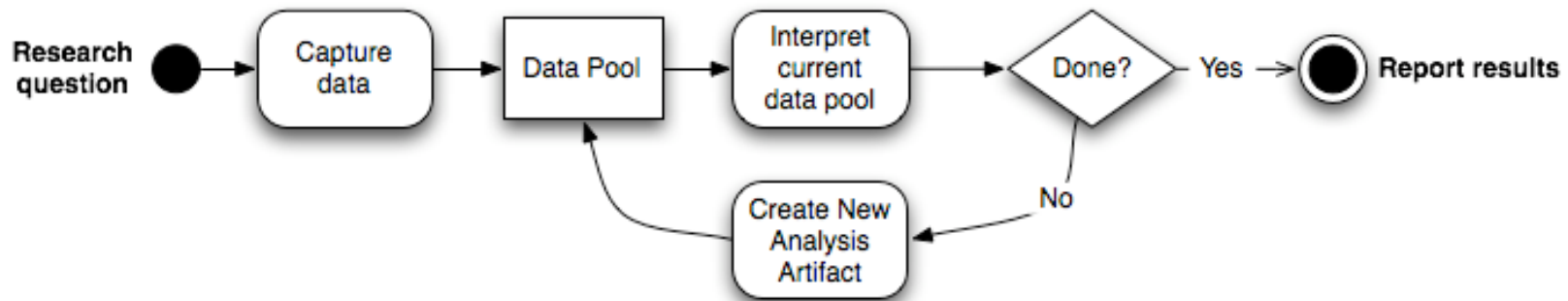
Maybe not!

Quantity of data



Analysis practices

- Gathered from
 - Case studies
 - Literature review (methodology)
 - State of the art (tools)



CoIAT (Avouris et al.)

Collaboration Analysis Toolkit v2.0.1 - Museum_15_of_April_2005 user: adrian

Analysis Project View Category Print Help

New Open Save Print Export Views Tasks Close Exit

Video 1

21. 3.05
19:45

Position 0:34:7 Total Time 42:24

Level1 Comments
At this point the tutor completes the general description of the Museum and the guidelines for the game to students PDA1 and PDA2

Observers notes

A...	Relative T...	Actor	Action
<input type="checkbox"/>	01:39:26	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:39:32	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:39:34	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:39:37	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:39:39	PDA 1	5.-Exit Application
<input type="checkbox"/>	01:39:39	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:39:40	PDA 4	8.-G1.-Send a sentence
<input type="checkbox"/>	01:39:43	PDA 3	9.-G1.-Accept a sentence
<input type="checkbox"/>	01:39:46	PDA 3	6.-G1.-Take a sentence from up to do
<input type="checkbox"/>	01:39:49	PDA 4	14.-G1.-Verify game
<input type="checkbox"/>	01:39:49	PDA 4	14.-G1.-Verify game
<input type="checkbox"/>	01:39:49	PDA 3	14.-G1.-Verify game
<input type="checkbox"/>	01:39:49	PDA 3	14.-G1.-Verify game
<input type="checkbox"/>	01:39:50	PDA 2	5.-Exit Application
<input type="checkbox"/>	01:40:08	PDA 3	11.-G1.-Change two sentences in the
<input type="checkbox"/>	01:40:10	PDA 3	14.-G1.-Verify game
<input type="checkbox"/>	01:40:10	PDA 3	14.-G1.-Verify game
<input type="checkbox"/>	01:40:26	PDA 1	0.-Connect
<input type="checkbox"/>	01:40:30	PDA 2	2.-Ask for a game
<input type="checkbox"/>	01:40:48	PDA 1	0.-Connect
<input type="checkbox"/>	01:40:51	PDA 1	2.-Ask for a game
<input type="checkbox"/>	01:41:00	PDA 2	18.-G2.-Change position
<input type="checkbox"/>	01:41:15	PDA 3	5.-Exit Application
<input type="checkbox"/>	01:41:22	PDA 4	5.-Exit Application
<input type="checkbox"/>	01:41:49	PDA 2	18.-G2.-Change position
<input type="checkbox"/>	01:41:57	PDA 2	18.-G2.-Change position
<input type="checkbox"/>	01:42:16	PDA 1	18.-G2.-Change position
<input type="checkbox"/>	01:42:32	PDA 1	
<input type="checkbox"/>	01:42:35	PDA 1	
<input type="checkbox"/>	01:42:36	PDA 1	
<input type="checkbox"/>	01:42:38	PDA 1	
<input type="checkbox"/>	01:42:40	PDA 1	18.-G2.-Change position
<input type="checkbox"/>	01:42:57	PDA 2	18.-G2.-Change position
<input type="checkbox"/>	01:43:00	PDA 2	18.-G2.-Change position

Level2

Entry Name	Entry Typolo...	Actor
Initializing the i...	user event	PDA 1, ...
The two team ...	Exploration	PDA 1, ...
User with PDA ...	user event	PDA 1, ...
First image exc...	collaboration	PDA 1, ...
User with PDA ...	individual	PDA 2, ...
The team memb...	individual	PDA 1, ...
Second image ...	collaboration	PDA 1, ...
Team members...	individual	PDA 1, ...
User with pda ...	individual	PDA 2, ...
Third image ex...	collaboration	PDA 1, ...

Level3

Entry Name	Entry Typolo...	Actor
Group1 Te		
Group 1 Te		

Level 2 Actions

Level 3 Activities

Viewer filter

Actor

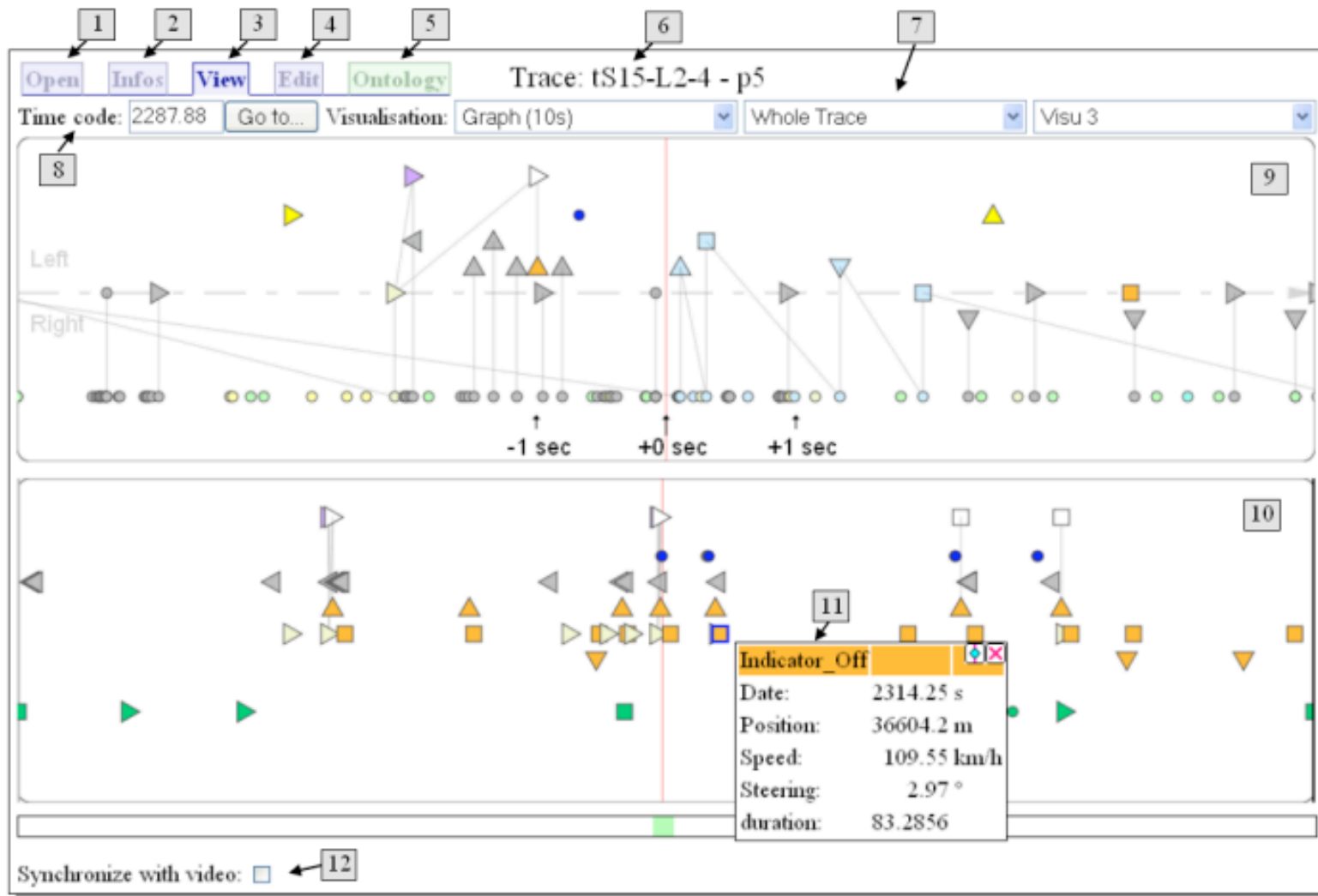
- PDA 2
- PDA 1
- PDA 4
- PDA 3
- PDA
- None

Logfile + added events

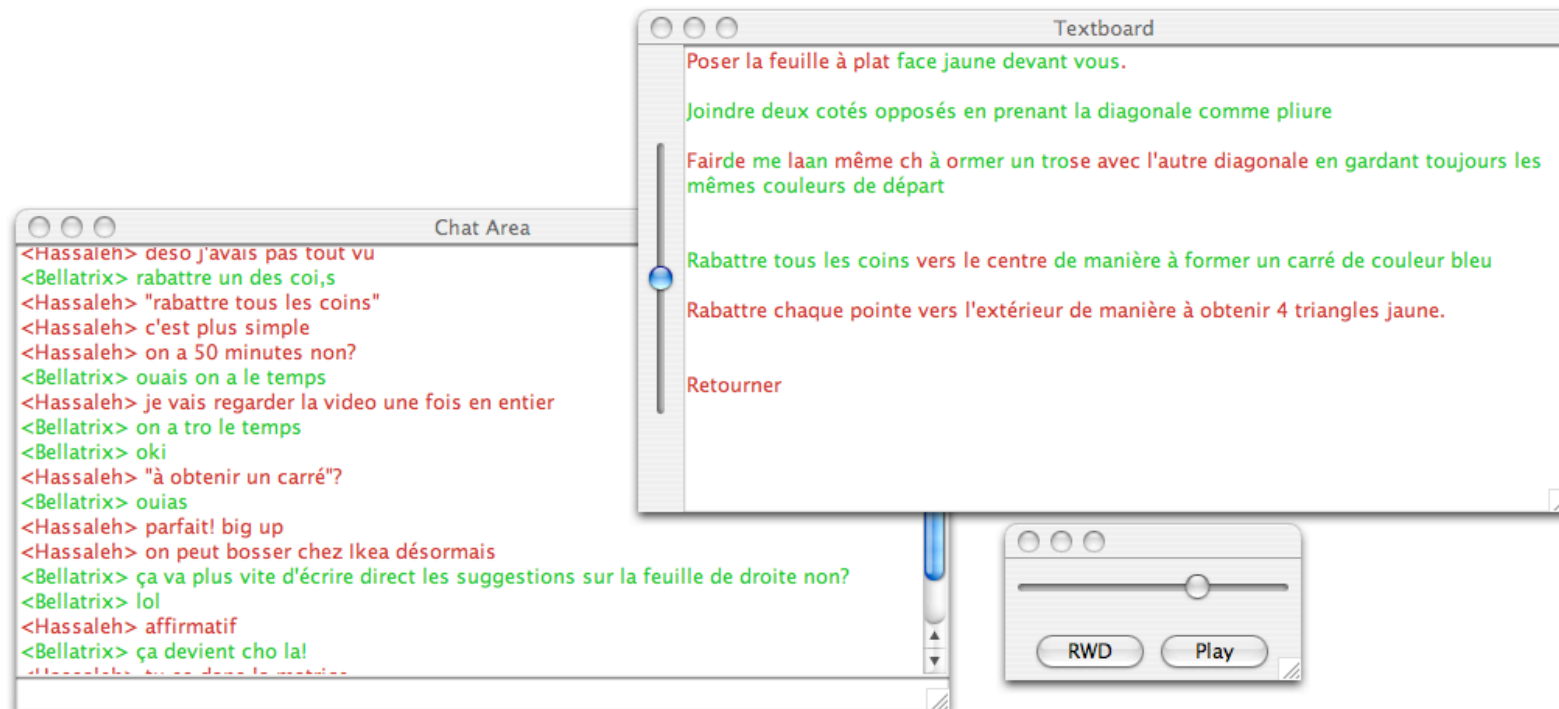
Replayer (Morrison et al.)



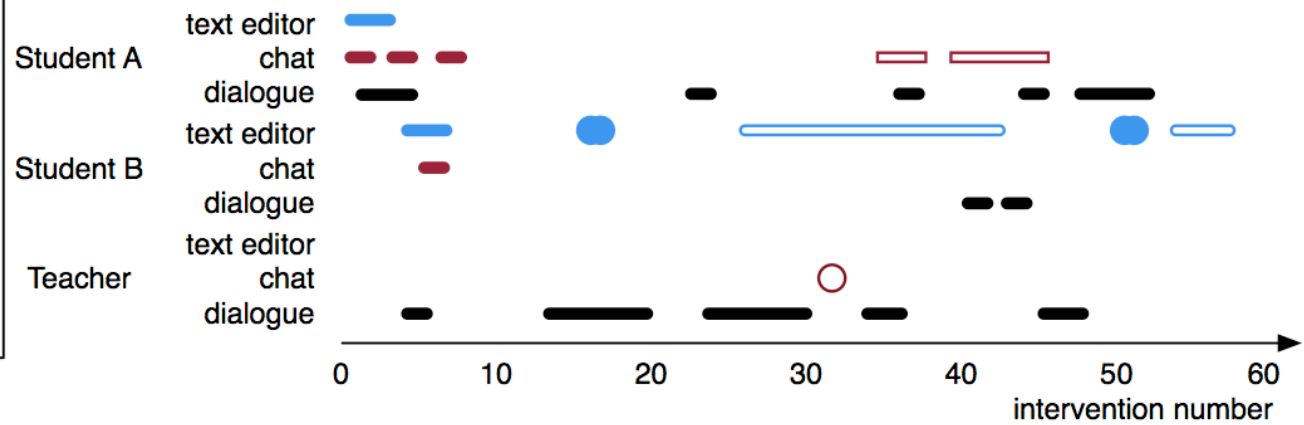
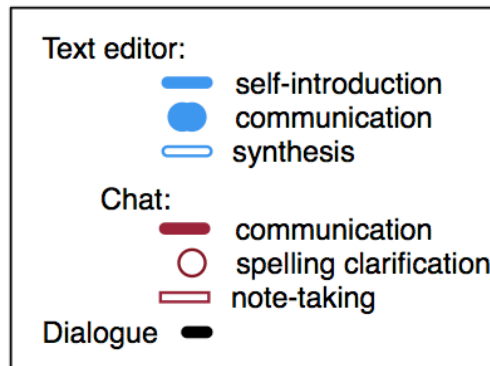
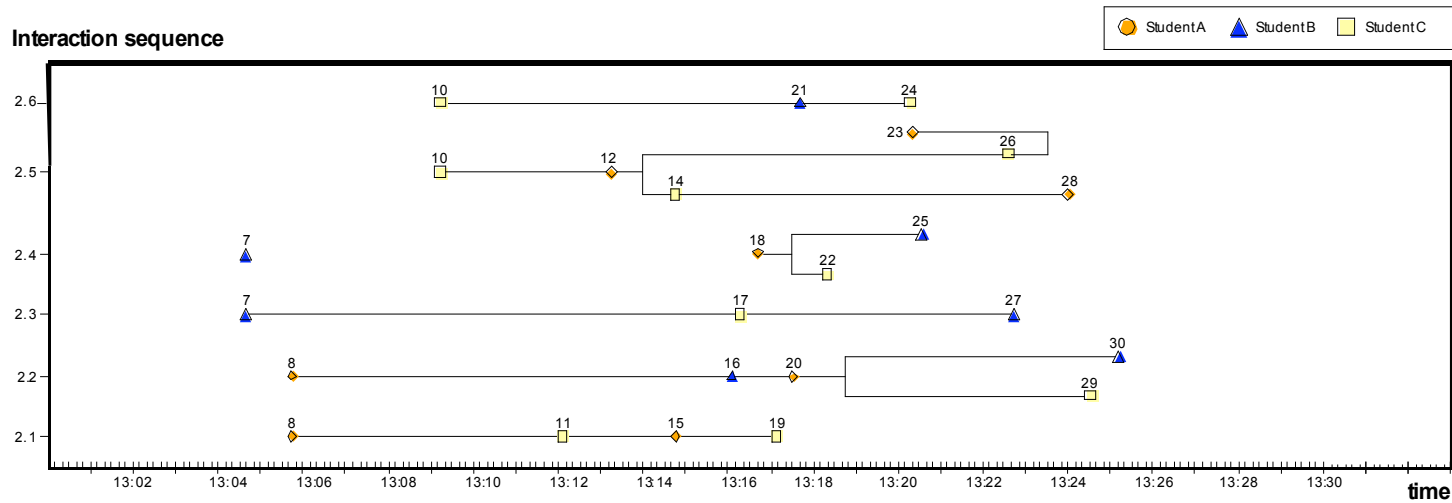
Abstract (Georgeon et al.)



DREW replayer (Corbel et al.)



Visualisations



Coding (rainbow)

10	10	13/11/2001 14h06:01.05	drew-chat	CoralieP	salut	3. Interaction management
11	11	13/11/2001 14h07:11.05	grapher	AuretteJ	se déconnecte du grapheur	3. Interaction management
12	12	13/11/2001 14h07:31.05	drew-chat	AuretteJ	alors prête pour 1 h?	3. Interaction management
13	13	13/11/2001 14h07:42.05	drew-chat	CoralieP	c'est parti!	4. Task management
14	14	13/11/2001 14h08:48.05	drew-chat	AuretteJ	alors que pense tu des ogm, (super question mais faut bien commencer)	4. Task management
15	15	13/11/2001 14h09:13.05	grapher	AuretteJ	se connecte au grapheur	3. Interaction management
16	16	13/11/2001 14h09:25.05	grapher	AuretteJ	créé la boîte 1	
17	17	13/11/2001 14h10:29.05	grapher	AuretteJ	argument de la boîte 1 : ogm que pour l'argent	6. Argumentation
18	18	13/11/2001 14h10:37.05	drew-chat	CoralieP	ils augment la pollution	6. Argumentation
19	19	13/11/2001 14h11:01.05	grapher	CoralieP	supporte l'argument de la boîte 1	5. Opinions
20	20	13/11/2001 14h11:11.05	grapher	CoralieP	créé la boîte 2	
21	21	13/11/2001 14h11:13.05	grapher	CoralieP	déplace en 164,251 la boîte 2	4. Task management
22	22	13/11/2001 14h11:39.05	drew-chat	AuretteJ	je suis d'accord	5. Opinions
23	22	13/11/2001 14h11:39.05	drew-chat	AuretteJ	on ne va pas beaucoup avancer!!!!	4. Task management
24	23	13/11/2001 14h11:44.05	grapher	CoralieP	argument de la boîte 2 : cause de pollution	6. Argumentation
25	24	13/11/2001 14h11:50.05	grapher	AuretteJ	créé la boîte 3	
26	25	13/11/2001 14h11:51.05	grapher	CoralieP	supporte l'argument de la boîte 3	5. Opinions
27	26	13/11/2001 14h11:53.05	grapher	AuretteJ	déplace en 293,181 la boîte 3	4. Task management
28	27	13/11/2001 14h11:55.05	grapher	CoralieP	déplace en 151,251 la boîte 2	4. Task management
29	28	13/11/2001 14h11:57.05	grapher	AuretteJ	déplace en 291,250 la boîte 3	4. Task management
30	39	13/11/2001 14h11:57.05	grapher	CoralieP	supporte l'argument de la boîte 2	5. Opinions
31	30	13/11/2001 14h12:21.05	grapher	AuretteJ	argument de la boîte 3 : détruit couche d ozone	6. Argumentation
32	31	13/11/2001 14h12:44.05	drew-chat	CoralieP	je suis d'accord aussi!!	5. Opinions
33						

Transcription / Annotation

Fichier Edition Rechercher Affichage Options Aide

Grille Texte Sous-titres Contrôles

Antoine.prop.

Nr	Annotation	Temps de d...	temps de fin	Durée
1	ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu...	00:00:09.670	00:00:29.600	00:00:19.930
2	pa(r)ce que pa(r)ce que c'est rare i(i) y a personne dans la mais...	00:00:43.160	00:01:01.560	00:00:18.400
3	oui	00:01:07.212	00:01:07.532	00:00:00.320
4	non	00:01:14.002	00:01:14.212	00:00:00.210
5	pa(r)ce que ils l'ont pas vu et i i(i)s doivent le voir parce que la ...	00:01:15.642	00:01:31.480	00:00:15.838

00:00:09.670 Sélection: 00:00:00.000 - 00:00:00.000 0

Mode de sélection Mode de boucle

00:00:00:000 00:00:10:000 00:00:20:000 00:00:30:000 00:00:40:000 00:00:50:000 00:01:00:000 00:01:10:000 00:01:20:000 00:01:30:000 00:01:40:000

Antoine.prop.
 A.Prop
 A.gr.deSouffle
 A.mot
 A.syllabe
 A.CGram
 Gestes

00:00:10.000 00:00:11.000 00:00:12.000 00:00:13.000 00:00:14.000 00:00:15.000

ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu

ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu

ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu

ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu

ah oui pa(r)ce que pa(r)ce que c'est le c'est le mouton qu(i) a heu

Analysis artefacts and the role they play

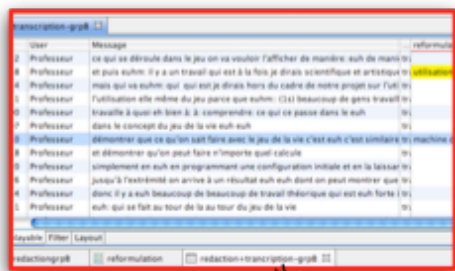
Tool replayer (5)

The screenshot shows the 'Tatiana' tool interface with several panels:

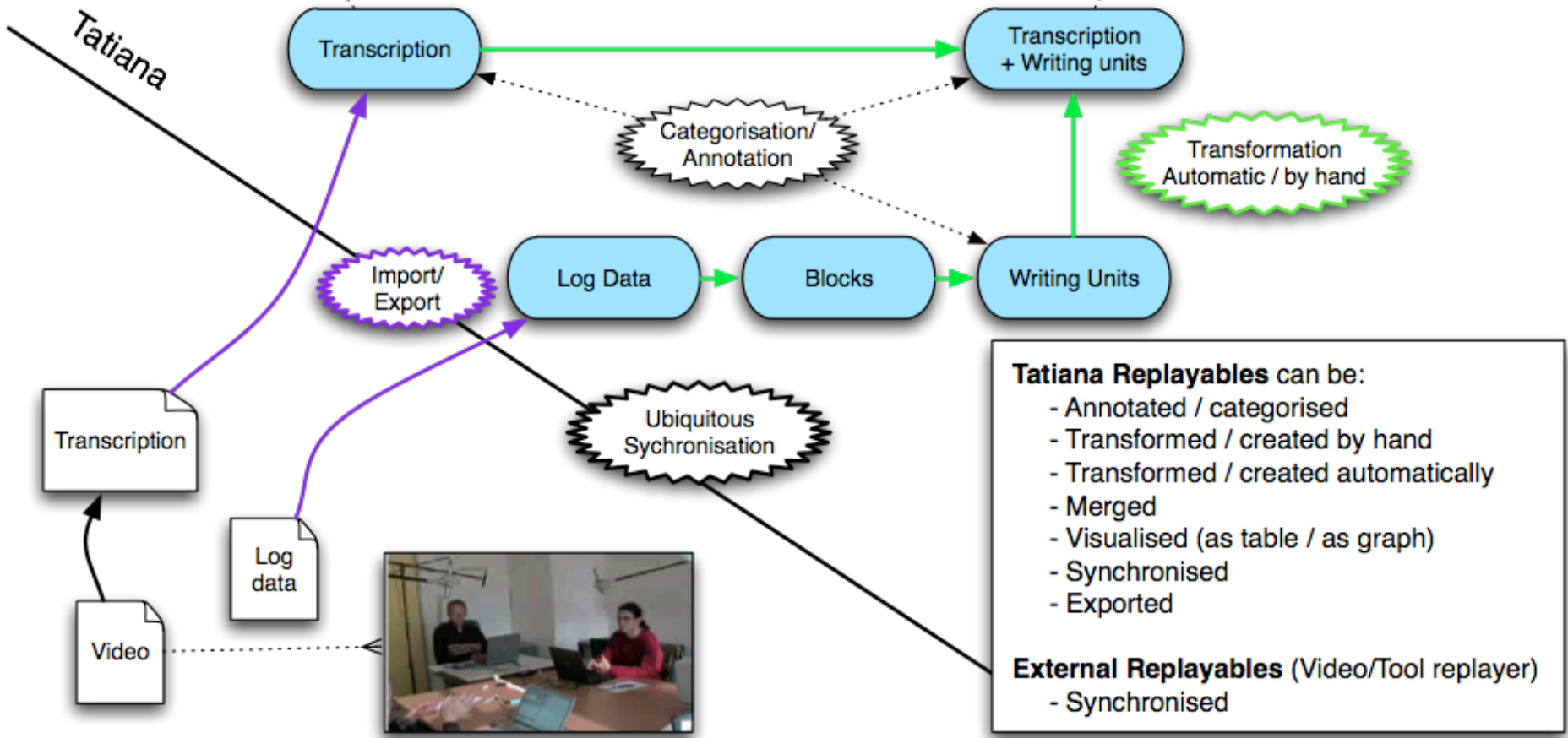
- Log Data (1):** A table with columns 'User', 'Message', and 'Tool'. It lists messages from 'francois' and 'Armand' with timestamps and descriptions of changes (e.g., '3 chars added near...').
- Writing units (2):** A table with columns 'begin', 'end', 'user', and 'contents'. It shows time intervals and associated text content.
- Transcription (3):** A list of messages from 'pfeiseur' with timestamps, such as 'et puis dans ce terrain de jeu je mais euh une configuration initial de cellule'.
- Visualisation (4):** A timeline visualization showing colored blocks representing transcription and writing units. Blue arrows point from this visualization to the Log Data and Transcription panels.
- Remote control (7):** A control panel with a timeline, 'Zoom In', 'Zoom Out', 'Play', 'Slower', and 'Faster' buttons.

Reformulation

Highlights are synchronised



Visual Representation



- Tatiana Replayables can be:**
- Annotated / categorised
 - Transformed / created by hand
 - Transformed / created automatically
 - Merged
 - Visualised (as table / as graph)
 - Synchronised
 - Exported
- External Replayables (Video/Tool replayer)**
- Synchronised

Replayables can undergo...

■ Synchronisation

- Provides context
- Not always enough

■ Transformation

- Import / Export
- Filter / Search
- Patterns
- Statistics and indicators
- Many other generic possibilities
- Folder for new scripts

■ Visualisation

- Table
- Scoresheet
- Plugin structure for new ones...

■ Enrichment

- Codes / Annotations
- Relationships
- Plugin structure for new ones...

To sum up...

- Environment for manipulating *replayables*
- Versatile tool for researchers
 - Many data formats and extension possibilities
- Currently used to analyse many kinds of data
 - Three of our own data sets (collaborative note-taking, collaborative design, children's explanations)
 - Argumentation (Switzerland)
 - Forums (Hong-Kong)
 - Blogs (Denmark)
 - LEAD project (G.B., Paris, The Netherlands)
 - Boundary object for discussion between epistemologies (series of workshops at ICLS, CSCL, Alpine Rendez-Vous)
 - French traditionnal dancing

Contents

- Computer Science in Tatiana
- Computer Science in Analysis
- Some problems
- Possible solutions

Computer Science in Tatiana

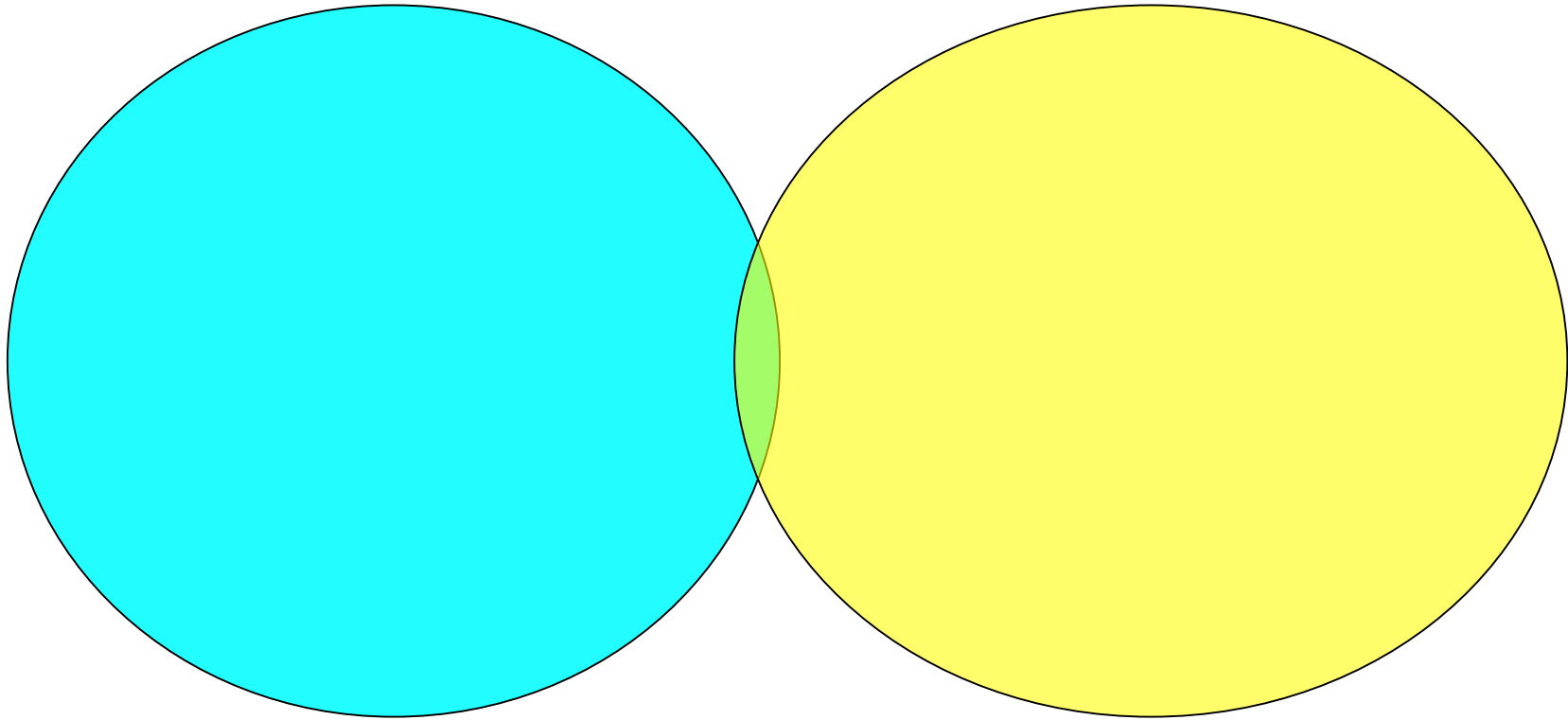
- Model the researcher's practice
- Model of analysis artefacts which will support this practice
- Implementation of this model
 - Necessary?
 - How to evaluate?
- Most of the implementation is just software engineering
 - Good if this tool is actually supposed to help people
 - Bad for a young researcher
 - Actually a quite hard engineering problem

Who else could have done Tatiana?

- Need to:
 - Understand researcher's activity
 - Model that activity
 - Produce an implementation
 - Have time to work on one project
- Software companies, some day?
 - Practices are too diverse, no money
- Big european project?
 - Still need someone to implement
- Social sciences researcher?
 - Maybe...

Computer Science in Analysis

- Data Mining
 - Find patterns
- Information Retrieval
 - Ask questions
- Natural language processing
 - Speech processing
 - Topic-extraction
 - Semantics and syntax
- AI
 - Classification
 - ITS
 - Machine learning
- HCI
 - Interfaces
 - Information visualisation



Problems

- What is a model ? (what are acceptable answers in different research disciplines)
 - Subdisciplines of computer science tend to have a very narrow view of what appropriate results are
 - Human usage of technology is always Somebody Else's Problem
- TEL ... what about the learning?
- For interdisciplinarity to happen, both disciplines need to find research questions
- Implementations often need several sub-disciplines
- ...and a good deal of software engineering
- Defining what *should* be implemented is hard -> most of the time you won't get what you wanted

Solutions?

- Field of applied computer science
- Phds in pairs
- Pluridisciplinarity
 - Publications in multiple domains
 - Accept that these people lose in depth because of the breadth
 - Find me a job!