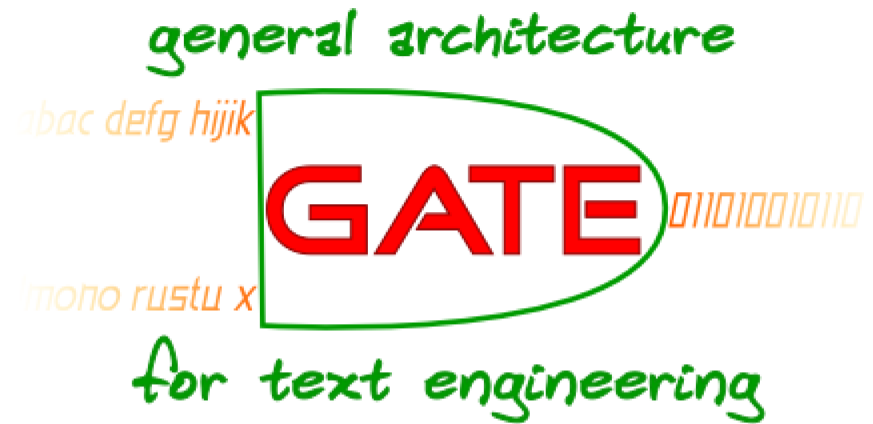


Module 4: Taking GATE to the Cloud

GATE Teamware
GATECloud.net
GATE Mimir



Module 4: Taking GATE to the Cloud

Part I: GATE Teamware

Outline

- Teamware
 - What is it?
 - Teamware for annotation
 - Teamware for quality assurance and curation
 - Teamware for defining workflows, running automatic services, managing annotation projects
 - GateCloud.net
 - Mimir
-

Hands-on Preparation

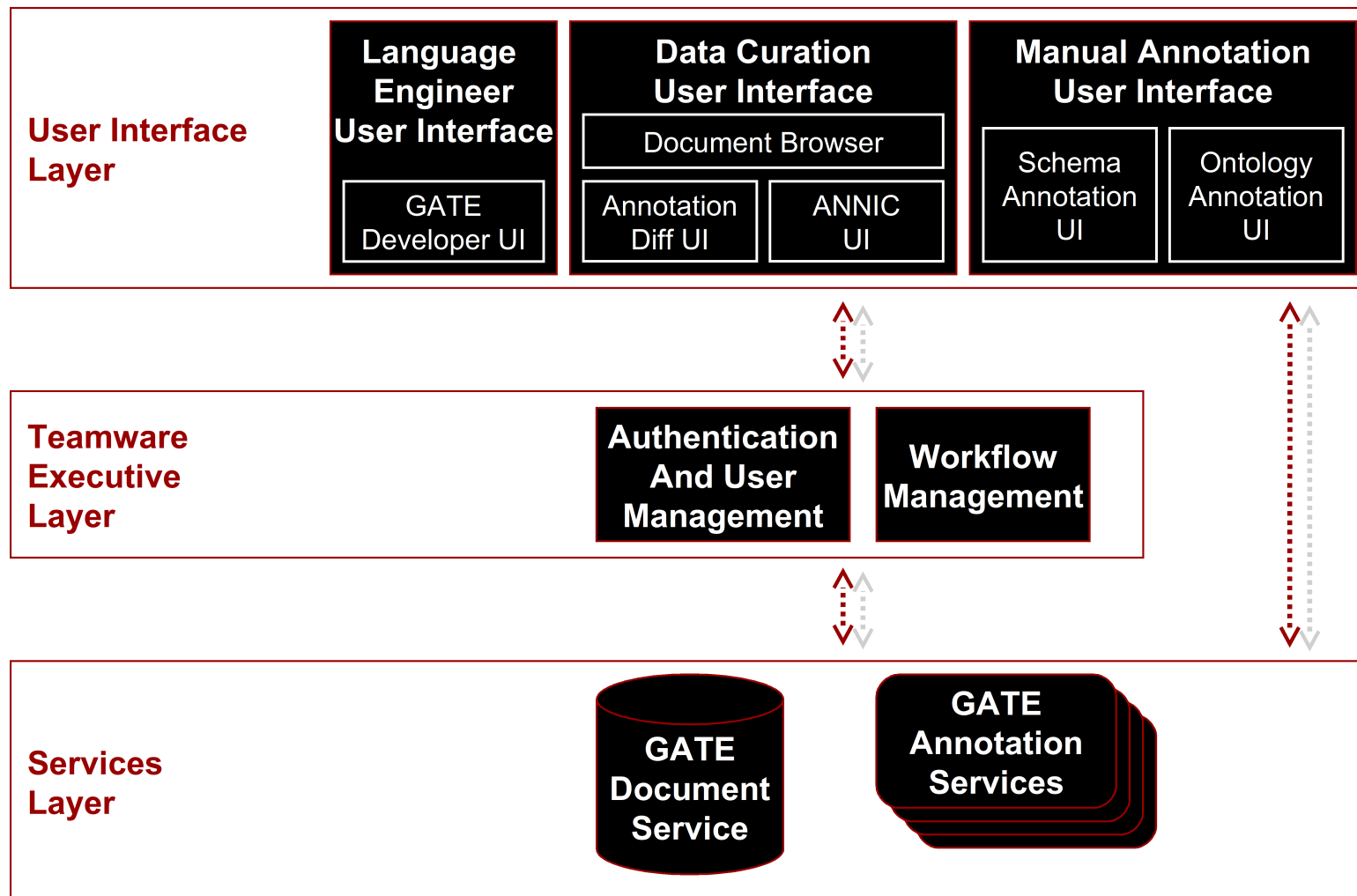
- Open the Teamware URL in your browser.
 - Log on with the provided user name and password.
 - Click on the link “Annotation Editor” to download and prepare the software for our first hands on. (This will get all the jars into your Java Web Start cache.)
 - When it opens, leave it as is, till we need it
 - Click [here](#) for more information about JWS
-

GATE Teamware

A Web-based Collaborative Annotation and Curation Environment

- Collaborative, distributed teams of annotators
 - Structured roles for large-scale corpus annotation (annotators, managers, administrators)
 - A set of generic text annotation tools for the roles
 - Interactions supported in a unified environment, through workflows
 - Open-source; available ready-to-use on GateCloud.net
-

Teamware - Components



Division of Labour: A Multi-role Methodology

- **Annotators**

- Carry out manual annotation: from scratch or (faster) by correcting automatic annotation (generated by rule-based tools, machine learning, or a combination)

- **Manager**

- Define **annotation guidelines and schemas**
- **Choose relevant automatic services to pre-process**
- Toolset including **performance benchmarking, progress monitoring tools, small linguistic customisations**
- Define **workflow, manage annotators**, liaise with language engineers and sys admins
- **Reconcile differences** between annotators, using IAA, AnnDiff

- **Admin**

- Setup the Teamware system, users, etc.
-

Teamware:

Manual Annotation Tool

Annotator GUI [Connected to POOL mode: kalina]

Document Editor

Type	Set	Start	End	Id	Features
Organization		4	19	159	{}
Date		23	31	170	{kind=date, rule1=GazDate, rule2=DateOnlyFinal}
Percent		104	119	157	{}
Percent		159	169	169	{rule=PercentBasic}
Date		212	222	138	{kind=date}
Organization		276	297	145	{orgType=unknown, rule1=OrgXBase, rule2=OrgFinal}
Organization		344	359	139	{}

34 Annotations (1 selected) Select:

The Bank of England on Thursday surprised the financial markets and delighted British businesses with a 0.25 percentage point cut in its main interest rate to 5 per cent. Interest rates have not been lower since early 1964.

But the mood inspired by the cut was marred by the European Central Bank's refusal to cut rates, and by concern at the Bank of England's growing pessimism about the global outlook.

Forecasters had expected the Bank's monetary policy committee to leave rates unchanged, but fears more cuts would fuel consumer demand and threaten higher inflation.

But the MPC said the unexpected severity of the global slowdown meant that inflation on track to hit its 2.5 per cent target in two years.

"Monetary policy needs to balance the weaker external environment with the need to support growth," it said. The MPC believes a two-speed economy of weak international demand and strong consumer demand is better than an economy in recession.

Since last month's MPC meeting, which voted eight to one to leave rates unchanged, signs domestic demand is cooling. Retail sales, household borrowing and new house sales have all fallen.

Annotation Editor Dialog

Type: Address Date Location Money Organization Percent Person Phone

Features: Case Regexp Whole Highlights

Bank of England

Task: 162 Document: ft-bank-of-england-02-aug-2001.xml

Manual Annotation

- Annotator: log into Teamware
 - Click on “Open Annotation Editor”
 - Request an annotation task (first button)
 - Annotate the assigned document
 - Save work in progress occasionally
 - Click on the “Finish task” button when done
 - If you want to save work and return to this task later – “Save” button, then close the UI. Next time you request a task, you get the same document back to finish it.
 - Depending on the project setup, you may be able to reject a document and then ask for another one to annotate (Reject button)
-

Hands-on

- Open a web browser and Teamware
 - Login using your annotator user name
 - Open the annotation UI
 - Try requesting tasks, editing annotations, saving your work, asking for another task
 - You need to annotate names of people and organisations
 - This is what Teamware looks like for manual annotation tasks
-

Teamware for Managers

- Defining workflows
- Running annotation projects
- Tracking progress
- Adjudication and measuring IAA

Teamware Workflows

- Whole process is controlled by a **workflow manager**
- Workflow may be simple:
 - Give the document to n human annotators
- or more complex
 - Pre-process the documents (Gate Developer/Gate Cloud)
 - Pass each document to 3 annotators
 - Adjudicate the differences

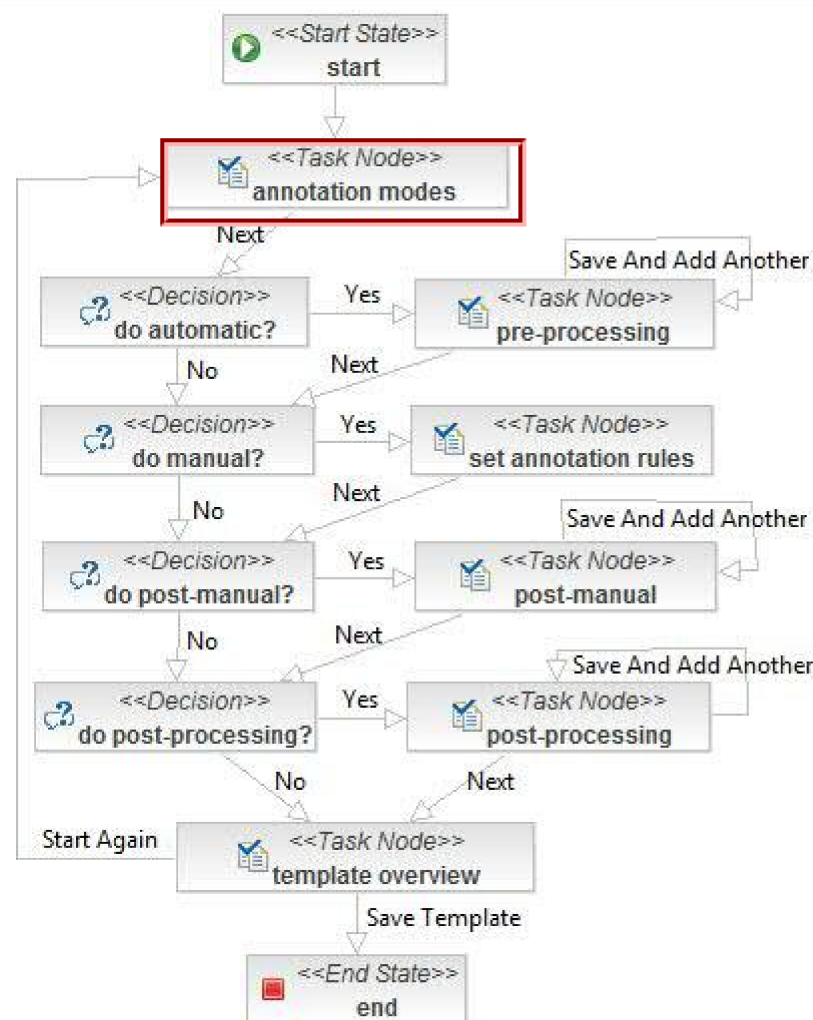
Workflow Templates

Automatic Annotation:	<input type="checkbox"/>
Manual Annotation:	<input type="checkbox"/>
Post-Manual:	<input type="checkbox"/>
Review:	<input type="checkbox"/>
Post-Processing:	<input type="checkbox"/>

Next

Help

Quit



Defining new workflows

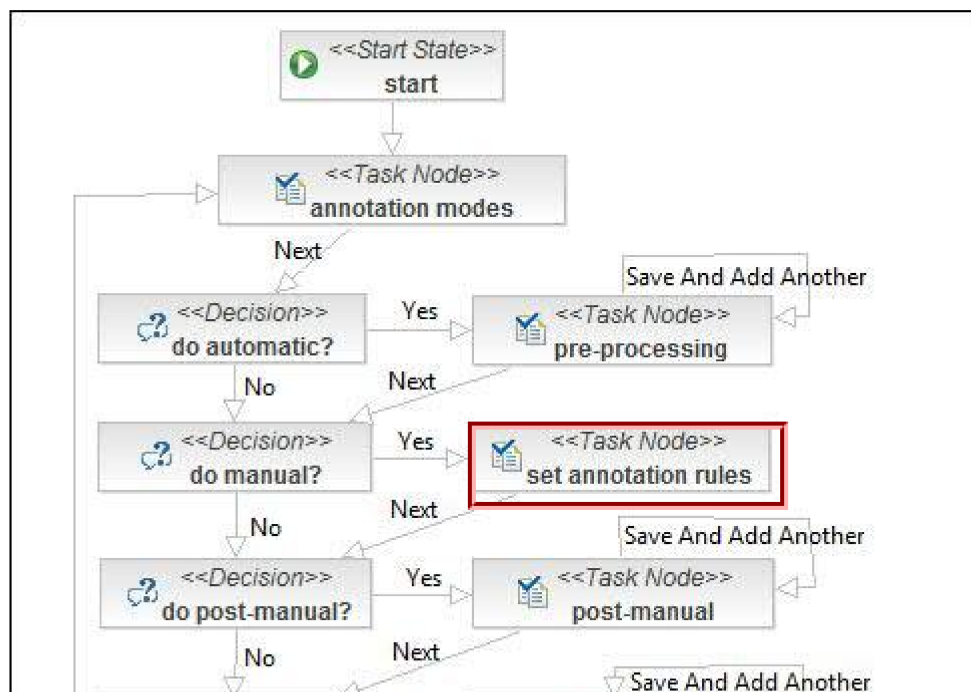
- Select Projects/WF Templates
 - Opens the WF wizard
 - Automatic annotation:
 - Runs one or more web services to pre-annotate
 - These need to be GATE Annotation Services (GAS), not just any service
 - The default Teamware installation includes ANNIE
 - Manual annotation
 - Post-manual: post-processing/merging service
 - Post-processing: Finalise and export corpus
-

Defining Manual Annotation WF

- Select only the Manual Annotation box in the WF template
- Configure further the number of annotators per document, whether they can reject documents, whether annotation sets are anonymous (annotator1, annotator2, ...)
- Select or upload annotation schemas

Annotators per Document:	2
Cancel Task Allowed:	<input checked="" type="checkbox"/>
Anonymous Annotation:	<input checked="" type="checkbox"/>
Annotation Schemas:*	OrganizationSchema.xml PersonSchema.xml AddressSchema.xml Non-FunctionalRequiremen ConcordiaDataGroupsSc ConcordiaRequirementsS
Add Schema:	Add Schema
Pre-Manual Service:*	None

Next Help Quit



Annotation Schemas

- GATE's annotation schemas can be used to constrain manual annotation for consistency
 - You can use the standard ANNIE schemas or develop your own
 - Schemas should be consistent with your annotation guidelines
-

Annotation Schemas

- Define types of annotations and restrict annotators to use specific feature-values
 - Person
 - Person.gender = male
 - Person.gender = female
- Uses the XML Schema language supported by W3C for these definitions

```
<?xml version="1.0"?>
<schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <element name="Person">
    <complexType>
      <attribute name="gender" use="optional">
        <simpleType>
          <restriction base="string">
            <enumeration value="male"/>
            <enumeration value="female"/>
          </restriction>
        </simpleType> ...
```

Running a Manual Annotation WF

- The WF template defined in the previous steps can be saved and the project started or revised, as necessary
 - To actually run a manual annotation WF, you need to create a project, which defines:
 - Which corpus is going to be annotated
 - Who are the managers and annotators
 - The corpus can be uploaded via the link provided and is a ZIP file of documents
 - can be in any format supported by GATE
-

Running a Manual Annotation WF

Project Name * <input type="text" value="Manual WF project"/>	Managers <input type="text" value="kalina"/>	Curators <div><div>ac4sa59</div><div>agaton</div><div>ishrar-cur-man</div><div>kalina</div><div>kalina-curator</div><div>matthew-cur-man</div><div>milan</div></div>	Annotators <div><div>ac4sa59</div><div>adam</div><div>agaton</div><div>angus</div><div>ayrin-ann</div><div>danica</div><div>diana</div><div>hamish</div><div>ian</div><div>ishrar-ann</div></div>
---	--	--	---

[Add Corpus](#)

- Once project is started, annotators can login and ask for tasks

Hands-On

- Login as a manager
 - Schemas:
 - Use the Person and Organization schemas provided with Teamware
 - Define your own manual WF with these schemas, specifying 2 annotators per document
 - Start a project with your WF template
 - Choose yourself as a manager and add your 2 annotators to the project
 - For corpus: use test-manual-workflow.zip from the resources directory. This contains 1 news document
-

Hands-On (Continued)

- Log out as manager and login as annotator
 - Open the annotation UI
 - You should now receive tasks from the projects of two other people, 2 documents in total (1 from each project – they will look identical, that's ok)
 - Annotate several Person and Organization names in each task
 - Remember to save and complete each task
 - Make a note of any issues you had when annotating and let's discuss them
-

Monitoring Project Progress

Process Monitoring: Annotation Status

[Detailed View](#) [Back to Project](#)

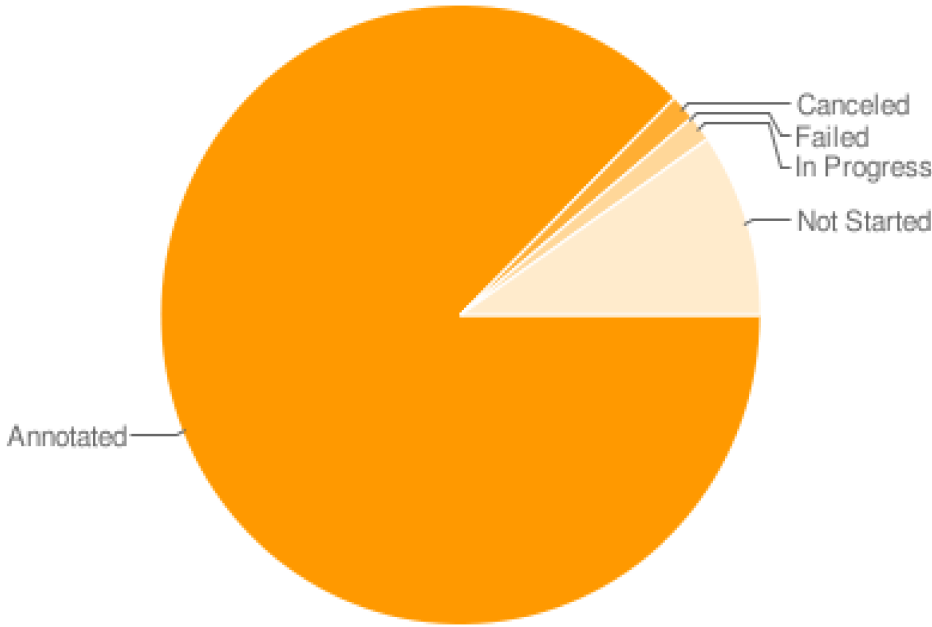
Status	#
Annotated	64
Canceled	1
Failed	0
In Progress	1
Not Started	7

Average Execution Time


627.609375

[Detailed View](#) [Back to Project](#)

Annotation Status Chart



Hands-On

- Log back in as a manager
 - Go to Projects/My Projects
 - Select the Process Button 
 - You will see the manual annotation task
 - Click on Monitoring to see the statistics inside
 - If both your annotators have completed their tasks, you should also receive a notification email
-

Adjudication

- Only available to the manager role
 - Identify differences between annotators using IAA
 - Inspect differences in detail using AnnDiff
 - Edit and reconcile differences if required
 - More sophisticated adjudication UI (the Annotation Stack View) in GATE Developer
-

IAA: Do my annotators agree?

[Home](#)[Resources](#)[Projects](#)[Support](#)

IAA Caculation on the document ft-airtours-08-aug-2001.xml

Please note you can NOT do caculation if there is no common annotation type on the two selected annotation sets or more.

Available Annotation Sets

Key
Original mark
safe.preproce
<Default>



Annotation Sets to Compare

annotator1
annotator2
annotator3



Annotation Type

Date



Feature

Algorithm

all-ways-f-measure



Caculate

Cancel

IAA: Results

IAA Caculation on the document ft-airtours-08-aug-2001.xml

Please note you can NOT do caculation if there is no common annotation type on the two selected annotation sets or more.

Available Annotation Sets

- Key
- annotator2
- Original mark
- annotator1
- annotator3
- safe.preproce
- <Default>

Annotation Sets to Compare

Annotation Type: Date

Feature:

Algorithm: all-ways-f-measure

Caculate Cancel

Overall F-Measure

Precision	Recall	F1	Precision Lenient	Recall Lenient	F1 Lenient	Correct	Partially Correct	Missing	Spurious
1.0	0.9411765	0.96875	1.0	0.9411765	0.96875	16.0	0.0	1.0	0.0

F-Measure values against the Key annotator1

Response	SP / SR / SF	LP / LR / LF	C / P / M / S
annotator2	1.0 / 1.0 / 1.0	1.0 / 1.0 / 1.0	17.0 / 0.0 / 0.0 / 0.0
annotator3	1.0 / 0.88235295 / 0.9375	1.0 / 0.88235295 / 0.9375	15.0 / 0.0 / 2.0 / 0.0

AnnDiff: Finding the differences

Annotation Diff GUI [Connected in DIRECT mode: ft-airtours-08-aug-2001.xml__1248214749368__610]

Annotation Diff GUI

Key: ft-airtours-08-aug-2001.xml Annotation Set: annotator1 Annotation Type: Date F-Measure Weight: 1.00

Response: ft-airtours-08-aug-2001.xml annotator3 Features: ☐ All ☐ Some ☒ None

Do Diff

Start	End	Key	Features	=?	Start	End	Response
123	136	third quarter	{kind= date}	-?			
180	219	first nine months of its financial year	{kind= date}	-?			
2473	2484	summer 2001	{kind= date, rule1= DateName, rule2= DateOnlyFinal}	=	2473	2484	summer 2001 {kind= date, rule1=
2121	2130	this year	{kind= date}	=	2121	2130	this year {kind= date}
237	255	quarter to June 30	{kind= date}	=	237	255	quarter to June 30 {kind= date}
1204	1220	end of this year	{kind= date}	=	1204	1220	end of this year {kind= date}
2797	2824	second quarter of next year	{}	=	2797	2824	second quarter of next year {}
2409	2418	last year	{kind= date}	=	2409	2418	last year {kind= date}
2270	2281	summer 2001	{kind= date, rule1= DateName, rule2= DateOnlyFinal}	=	2270	2281	summer 2001 {kind= date, rule1=
337	346	last year	{kind= date}	=	337	346	last year {kind= date}
2167	2176	next year	{kind= date}	=	2167	2176	next year {kind= date}
1560	1584	nine months of this year	{kind= date}	=	1560	1584	nine months of this year {kind= date}
2326	2332	winter	{kind= date, rule1= GazDate, rule2= DateOnlyFinal}	=	2326	2332	winter {kind= date, rule1=

Correct: 15 Recall Precision F-Measure **Export to HTML**

Partially Correct: 0 Strict: 0.8824 1.00 0.9375

Missing: 2 Lenient: 0.8824 1.00 0.9375

False Positives: 0 Average: 0.8824 1.00 0.9375

Document: ft-airtours-08-aug-2001.xml__1248214749368__610

Where are these in Teamware?

- Only visible to managers
 - Resources/Documents menu
 - Select the corpus worked on
 - Iterate through each document
 - Run IAA and AnnDiff, as required
 - These are clumsy, as are on a document by document basis
-

GATE Developer adjudication facilities



- Download the corpus as a zip file
 - Corpus QA Tool
 - A corpus-level view of IAA (F-measure or Kappa)
 - Extended AnnDiff to allow easy reconciliation of the differences between 2 annotators
 - Annotation Stack View to reconcile difference visually, of 2 or more annotators
-

Adjudication in AnnDiff

Annotation Diff Tool

Key doc: ft-pirelli-10-aug-2...

Key set: annotator1

Type: Date

Weight: 1.0

Compare

Resp. doc: ft-pirelli-10-aug-2...

Resp. set: annotator2

Features: ☐ all ☐ some ☒ none

Start	End	Key	Features	K=?	R	Start	End	Response
590	597	July · 28	{kind= date, rule1= Da...rule2= DateOnlyFinal}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	590	597	July · 28
1313	1321	Thursday	{kind= date, rule1= Ga...rule2= DateOnlyFinal}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1313	1321	Thursday
1262	1266	2002	{kind= date, rule1= Ye...rule2= DateOnlyFinal}	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1254	1275	between · 2002 · and · 2004
1271	1275	2004	{}	<input type="checkbox"/>	<input type="checkbox"/>			

Target set: consensus

Copy selection to target set

2 documents loaded

Show document

Export to HTML

Statistics

Adjudication

Adjudication in AnnDiff

- Select the annotations which are correct by ticking the boxes (see previous screen shot)
 - Provide the name of the target consensus set
 - Click on the button to copy them into that set
 - Once copied, they are removed from the list of annotations to adjudicate, so the curator can focus on the remaining ones
 - Adjudication works one annotation type at a time and only for 2 annotators, whose results are stored into 2 different annotation sets
-

Annotation Stack View

The screenshot displays the GATE Annotation Stack View interface. The main window shows a text document with several paragraphs. The first paragraph discusses the Telecom Italia payment of E15.5m and the Benetton family's control over Olivetti. The second paragraph mentions board members' objections. The third paragraph details Mr. Colaninno's salary and bonuses. The fourth paragraph describes the purchase of Olivetti shares. The fifth paragraph mentions the expected new board. The sidebar on the right shows the 'Original markups' section with two annotators, 'annotator1' and 'annotator2'. Both have 'Date' checked. The bottom section shows the 'Context' and 'Previous boundary' buttons, and a table with annotations for 'annotator1#Date' and 'annotator2#Date'.

Annotation Sets Annotations List **Annotations Stack** Co-reference Editor OAT Text

But when the Telecom Italia payment of E15.5m was proposed last week, its board rejected it. Pirelli and its ally, the Benetton family, gained control on **July 28** by buying 23 per cent of Olivetti from Bell, an investment group headed by Mr Colaninno and others. The E31m payouts would be in lieu of options and any other compensation due to him. Mr Colaninno was also chief executive of Olivetti.

Several board members objected that Telecom Italia shares had not risen since Mr Colaninno took control and that the figure was too high.

Mr Colaninno had a salary last year of E3.5m from Telecom Italia and E819,000 from Olivetti. He also had cash bonuses of E3.6m from Telecom Italia and E700,000 from Olivetti and other companies controlled by Olivetti.

In addition, he received options to buy 12.6m Olivetti shares **between 2002 and 2004** at E2.81 a share. Olivetti shares on **Thursday** closed at E1.94 compared with the E4.17 – an 80 per cent premium to the market – paid by Pirelli and the Benetton family when they bought their controlling stake. The shares fell when investors realised they would not benefit from a takeover.

Pirelli is expected to bring in a new board this autumn but several members are likely to object again to the payment. The Olivetti board might approve its E15.5m payout but minority shareholders in both companies may

Previous boundary Next boundary

Context 6m Olivetti shares between 2002 and 2004 at E2.81 a share. Olivetti shares on Thu

annotator1#Date			
annotator2#Date			

Annotation Stack View

- Open the Document Viewer
 - Select the “Annotations Stack” button
 - Select the annotation types you’d like to reconcile, from as many annotation sets as needed
 - The Stack view window is at the bottom
 - Context shows the part of the document which we are working on now
-

Annotation Stack View

- The Previous/Next boundary buttons position the text we're working on (the Context) on the previous/next annotation of the chosen type
 - Note that such annotation may only exist in one of the sets, i.e., the other annotator might have missed it!
 - Hover the mouse over the coloured annotation rectangles to see further details
 - Right click would open the annotation editor
 - Double click copies the annotation to the target consensus set (you choose which one it is)
-

Annotation Stack View

Mr Colaninno had a salary last year of E3.5m from Telecom Italia and E819,000 from Olivetti. He also had cash bonuses of E3.6m from Telecom Italia and E700,000 from Olivetti and other companies controlled by Olivetti.

In addition, he received options to buy 12.6m Olivetti shares between 2002 and 2004 at E2.81 a share. Olivetti shares on Thursday closed at E1.94 compared with the E4.17 – an 80 per cent premium to the market – paid by Pirelli and the Benetton family when they bought their controlling stake. The shares fell when investors realised they would not benefit from a takeover.

Previous boundary

Next boundary

Target set: consensus

Context

6m Olivetti shares between 2002 and 2004 at E2.81 a share. Olivetti shares on Thu

annotator1#Date

annotator2#Date

consensus#Date

annotator1

☒ Date

☐ Money

☐ Organization

☐ Percent

☐ Person

☐ Percent

☐ Person

consensus

☒ Date

Copy annotation to another set

Semi-automatic Projects

- You can pre-process the corpus with pipelines in GATE Developer and then have people improve the annotations manually
 - Make sure in GATE Developer that you store all automatically produced annotations in an annotation set called **safe.preprocessing**
 - Then in Teamware, when you specify the manual workflow, make sure that you select to run the pre-manual service, which is called **gas:pre-manual gas**
 - This service will copy all annotations from the safe.preprocessing set to the annotation set storing the results from the manual annotation, for each of the annotators. This is done at the moment when annotatorX requests this document for annotation, not earlier.
-

Configuration: "manual annotation"

Next

Pre-Manual Service:*	gas: pre-manual gas ▼
Annotators per Document:	2 ▼
Cancel Task Allowed:	<input checked="" type="checkbox"/>
Anonymous Annotation:	<input checked="" type="checkbox"/>
Annotation Schemas:*	<div>Address.xml Money.xml Percent.xml Organization.xml Location.xml Date.xml</div>
Add Schema:	Add Schema



How can I use Teamware?

- Available from <http://gatecloud.net/> for experimentation and use
- Open source from gate.ac.uk
- Contact us for a pre-installed virtual machine image, if you wish to run in-house

Advanced Teamware

- The QA Summariser
- In GATE Developer, load plugin Teamware_Tools
- It's only this tool so far, but more in the pipeline

QA Summariser

- Documents annotated in Teamware have special document features:
 - `safe.asname.annotator1`
 - `safe.asname.annotator2`
 - ... (up to the number of annotators you specified per document)
 - The values are the login names of the annotators who created these annotations
 - Note that in one document `annotator1` could be `kalina` and for another – `mark`, 3rd – `danica`, etc. Then `kalina` could be `annotator2` in another document, etc.
-



GATE

- Applications
 - Corpus Pipeline_00031
- Language Resources
 - ft-pirelli-10-aug-2001.xml_0002B
 - ft-mortgage-lenders-04-aug-2001.xml
 - GATE Corpus_00014
- Processing Resources
 - QA Summariser for Teamware_00020
- Datastores

C	MimeType	▼	text/html
C	entitySet	▼	==== FILE: /Z:
C	gate.NAME	▼	doc3
C	gate.SourceURL	▼	file:/Z:/Corpus
C	safe.asname.annotator1	▼	TestAnnotato
C	safe.asname.annotator2	▼	TestAnnotato
C		▼	

A dispute is brewing between Pirelli and the board of Telecom Italia, the telecommunications group it took control of a week ago, over a proposed E15.5m (\$13.8m) payout to Roberto Colaninno, the ousted Telecom Italia chief executive.

Pirelli revealed it had agreed with the investors who sold it control of Olivetti - Telecom Italia's holding company - that Olivetti and Telecom Italia "will approve" paying Mr Colaninno E15.5m each.

But when the Telecom Italia payment of E15.5m was proposed last week, its board rejected it. Pirelli and its ally, the Benetton family, gained control on July 28 by buying 23 per cent of Olivetti from Bell, an investment group headed by Mr Colaninno and others. The E31m payouts would be in lieu of options and any other compensation due to him. Mr Colaninno was also chief executive of Olivetti.

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In addition, he received options to buy 12.6m Olivetti shares between 2002 and 2004 at E2.81 a share. Olivetti shares on Thursday closed at E1.94 compared with the E4.17 - an 80 per cent premium to the market - paid by Pirelli and the Benetton family when they bought their controlling stake. The shares fell when investors realised they would not benefit from a takeover.

Pirelli is expected to bring in a new board this autumn but several members are likely to object again to the payment. The Olivetti board might approve

Type	Set	Start	End	Id	Features
0 Annotations (0 selected) Select:					

- Original markups
- ▼ annotator1
- ☐ Date
 - ☐ Money
 - ☐ Organization
 - ☐ Percent
 - ☐ Person
- ▼ annotator2
- ☐ Date
 - ☐ Money
 - ☐ Organization
 - ☐ Percent
 - ☐ Person

QA Summariser

- The QA Summariser lets you get performance statistics on the real annotators (e.g., kalina, mark, danica) rather than compute IAA figures for the sets named annotator1, annotator2, etc.
- The reason why we make the sets in all documents in Teamware to be called annotator1, annotator2, etc is because we want to be able to post-process the corpus easily in a unified fashion, e.g., run JAPE grammars and they all need to have the same annotation set name as input. If we have sets called by annotator login details, they will vary, e.g kalina and mark on doc1, mark and danica on doc 2

QA Summariser: Create PR

- Load the Teamware_Tools plugin
 - Create a QA Summariser PR in GATE Developer (right click on the Processing Resources)
 - Create a corpus pipeline and add the PR to it
 - Open resources/qa-summariser-corpus.zip and unpack in a local directory
 - Create a new corpus and populate it from this directory. There are 2 documents
-

QA Summariser: Run PR

- Provide annotation types:
 - Date, Person, Location, Organization
 - No features for this example, as we are comparing only the types
 - Measure: f1-average
 - Provide a new output directory, where it will write the html files
 - Go to that directory and open index.html in your browser
-

QA Summariser Output

Summary of IAA Results

AnnotationTypes: Person;Date;Location;Organization;

Features:

Measure: F1_AVERAGE

Author Names	TestAnnotator1		TestAnnotator3		Averages	
	Macro	Micro	Macro	Micro	Macro	Micro
TestAnnotator1			0.83	0.81	0.83	0.81
			document			
TestAnnotator3	0.83	0.81			0.83	0.81
	document					

Avg. IAA macro avg: 0.83

Avg. IAA micro avg: 0.81