White Paper: A Survey of Current Collation Tools for The Modernist Versions Project

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Introduction

This white paper was produced by Dr. J. Matthew Huculak, a Postdoctoral Fellow with the Modernist Versions Project, and Ashlin Richardson, a Computer Science Ph.D. Candidate at the University of Victoria, during the 2012-2013 academic year. Many people associated with the Modernist Versions Project and its partners contributed to initial versions of this paper—all of whom we thank profusely, especially Adele Barclay, Daniel Carter, Alex Christie, Adam Hammond, and especially Katie Tanigawa. We also thank the MVP Board for its help and suggestions on earlier drafts. This includes invaluable advice from Susan Schreibman, Stephen Ross, Jentery Sayers, Dean Irvine, Tanya Clement, and James Gifford.

Huculak has experience working in textual scholarship, and Richardson has many years experience developing software. Richardson was thus tasked to look at the code of each program to reveal, according to expertise, the way each program works.

The paper is a survey of current collation tools for the Modernist Versions Project. It builds upon Hans Walter Gabler's white paper, "Remarks on Collation," published online in 2008, and accounts for collation tool development since Gabler's survey. This paper is not a history of collation tools in the humanities. It is a survey and review of tools that are still being used for collation and visualization of collated texts. We review eight tools that have been developed specifically for textual collation, one tool developed for displaying the Text Encoding Initiative's parallel segmentation in a web browser, and two version control systems.

List of tools tested in this survey:

- JUXTA-COMMONS + JUXTA DESKTOP
- TUSTEPTXSTEP
- TEI COMPARATOR
- TEXT::TEI::COLLATE
- COLLATEX
- DV COLL
- SIMPLETCT
- HRIT TOOLS (NMERGE)
- VERSIONING MACHINE
- GIT
- SVN (SUBVERSION)

Problem Statement

Collation has three meanings in terms of literary criticism: First, in book production, collation is "to assemble sheets or gatherings for binding." In bibliography, collation is "to analyze and record the number, order, and arrangement of leaves and gatherings in a book." Finally, in textual criticism, collation is "to compare one text with another to discover textual variation" (Abbott and Williams).

Editors interested in bibliographical and textual studies seek out textual variation in order to discover and annotate differences between texts in order to chart the genealogy of a text and make critical assumptions about a work's history. Traditionally, this is has been a painstaking process. The "Wimbledon Method" of collation is to use one's fingers to trace the lines in two books simultaneously in order to discover variation. Charlton Hinman invented the "Hinman Collator" in the 1940s by using strobe lights and mirrors to indicate differences between two editions printed using the same plates.

With the advent of computing, collation has taken on a broader meaning as "the general term for the process and function of determining the sorting order of strings of characters. It is a key function in computer systems; whenever a list of strings is presented to users, they are likely to want it in a sorted order so that they can easily and reliably find individual strings" (http://www.unicode.org/reports/tr10/). This "string sorting" can range from DNA sequencing to comparing two or more text files of a given work. Since the 1970s, software has been specifically developed to aid scholars in finding differences between texts in order to formulate critical assumptions about literary heritage.

The Tübingen System of Text Processing tools (TUSTEP) is one of the oldest textual-data processing programs in the humanities, and it was famously used by Hans Walter Gabler to edit his 1984 Synoptic Edition of James Joyce's *Ulysses* (http://www.tustep.uni-tuebingen.de/tustep_eng.html). Jerome McGann's Nineteenth-century Scholarship Online (NINES) developed its own collation program called Juxta in order compare texts as part of that project, which has recently been released as a web-based version.

The Modernist Versions Project is interested in using textual collation tools as part of its workflow for comparing texts. This whitepaper examines twelve textual collation tools in order to account for developments in the field since Gabler's original investigation.

Scholars need a way to reliably identify differences between texts. Though there is an array of tools developed for collation processing, each tool has been developed with a specific use case in mind. Some tools were developed for specific projects and may not scale to uses outside of that project.

The problems this white paper seeks to answer are: What tools are currently available for textual collation? What are their relative weaknesses and strengths? How can these tools be used by members of the Modernist Versions Project in collation and visualization work?

Current State of Knowledge

The current state of textual-collation software development may be divided in to two camps: those tools that support the Text Encoding Initiative, and those that seek to represent variation in non-TEI expressions—whether these expressions be text based or based on news ways of representing variation (see Desmond Schmidt's "A Data Structure for Representing Multi-Version Texts Online").

Since many of the collation tools we review were developed for a specific project in mind, most of the tools are limited to simple collation. Larger systems, like TUSTEP, operate on a modular basis, and can accommodate different parts of textual scholarship and publication workflows.

One of the first widely successful textual collation software used by textual critics is the The Tübingen System of Text Processing tools (TUSTEP) developed by Wilhelm Ott at the University of Tübingen. Ott describes TUSTEP as:

> a professional toolbox for those academic fields where texts are the object of research. Its potential is illustrated by two examples: (i) typesetting a TEI-lite encoded text, using the TEI tags as formatting instructions; (ii) preparing a critical edition, starting from automatic collation, then semi-automatically selecting the 'substantial' variants from the collation results, transforming them into a critical apparatus, and publishing the edition both in print and electronically. (Stategies and Tools)

First implemented in the 1970s (http://tustep.wikispaces.com/TUSTEP), TUSTEP has had a remarkable lifespan as a suite of tools used for over forty years. AT DH2012, Wilhelm Ott and Tobias Ott announced the development of a new tool, TXSTEP, "an XML-based program for scholarly research in the text-based humanities," built on the "architecture" and "experience" supporting TUSTEP.

Though useful and well-used, TUSTEP's programming was originally written with an assembly language. It is highly complex and requires training for use, and it does not take advantage of up-to-date standards; this is one reason TXSTEP was developed since it offers "an up-to-date established syntax," uses a more friendly interface in terms of XML editing, and offers, "to a certain degree, a self-teaching environment." One challenge that persists for some textual scholars, however, is that, at the time of writing this white paper, the supporting documents are written solely in German. Moreover, the program is still a prototype and has not yet been released for general use.

The newest tool we tested is the JuxtaCommons environment developed by NINES. This web-based, open-source program, was released as a beta in 2012, and offers users the ability to upload different file types and collate and visualize them within the browser.
Also under development is the European CollateX environment, which, according to our documentation, collaborates frequently with the Juxta development group. Both these tools offer strong and competing ways of working with textual variation.

Other tools currently available include the TEI Comparator, Text::TEI::Collate, and DV-COLL, which were developed for specific projects (TEI Comparator was used in the Holinshed Project, for example). Finally, there are tools currently under development, like HRIT tools, based on Desmond Schmidt's nMerge.

Collation remains an important part of textual scholarship and editing, especially as projects seek out ways of displaying multiple texts online. Editing Modernism in Canada, for example, is a multi-year project to publish underrepresented Canadian modernists online. The Project Director, Dean Irvine, has expressed interest in allowing readers to see multiple witnesses of text side-by-side in the browser. The need for tools that identify differences between texts remains as strong as ever as print works are remediated online.

Finally, there are developments in the field in terms of "versioning." Matthew Kirschenbaum explores the role of software versioning in artistic literary production in his chapter "Save as" in *Mechanisms*. The tools tested in this survey are largely concerned with works that exist in paper form and have been digitally remediated into text files. Since our primary area of interest is modernism, we limited ourselves to these types of tools since the material with which we work is print-based. This survey is not exhaustive. A larger survey of collation, authorship, and publication tools (following the work of Kirschenbaum) is warranted.

Contextual Analysis

Modernist scholars face particular difficulties when collating textual versions of a work. The primary challenge arises from the complicated transatlantic copyright situation of modernist production, as well as the author's own interests in the editorial process. Modernist authors, more so than their predecessors, tended to be more engaged in the editorial and publication process of their work. George Bornstein's book-length study, *Representing Modernist Texts: Editing as Interpretation* (1991), explores this phenomenon in more detail. Bornstein notes that modernists'

> editorial labor was often their own art. Their effort to control the process of textual production involved not only authority over the text itself but also determination of the form in which it appeared to the public and influence over institutions of transmission, whether magazines, anthologies, or entire publishing houses. (2)

The "institutions of transmission" had undergone rapid technological and social change around the turn of the twentieth century with the rise of the periodical press and mass-production in printing. For example, William Butler Yeats not only published in large circulating newspapers in Dublin, he started his own little magazines in Dublin and eventually collaborated with his sister at the Cuala Press in bringing out editions and different versions of his work. Bornstein argues that this editorial control, combined with copyright laws, created a situation where the "protean" nature of modernist writing—one which reveals multiple versions of a work—was concretized by the necessity of securing copyright in the United States. Bornstein notes,

> Despite the early adroitness of Yeats, Pound, or even Eliot in manipulating editors and publishers (and they themselves were editors, of course), the modernists eventually settled into long-term copyright arrangements with their publishers: in America, if you wanted to read Yeats, you turned to Macmillan; if Moore, to Viking; if Pound or Williams, to New Directions; if Eliot, to Harcourt Brace for the poetry and Farrar Straus for the prose; and in England for Yeats again to Macmillan and for many of the other poets to Faber, where Eliot himself served as editor and director. The result was to "freeze" the principal texts in the form distributed by those publishers, to the loss of all earlier forms, and if writers like Yeats continued their revisions, the latest ones were apt to shove aside all the others. Readers of Moore's "Poetry," Pound's *Cantos*, or Yeats's *Collected Poems*, for example, were simply furnished with the latest form of those poems, with little or no indication that earlier forms even existed, let alone what they were. (*Material Modernism* 39)

The illusion of fixity was further reinforced by the New Critical obsession with authorial intention and the "well-wrought urn," concepts supported by market realities rather than the actual artistic process of creation. As Bornstein notes, by returning to the multiple sites of publication, we do "merely" create "a series of variants but, more importantly, [we create] a physical enactment of the process of transmission of modernist poetry" (35).

New Modernism

Bornstein's focus on studying all versions of a given work is very much in the spirit of the rise of the "new modernist studies" (expressed by Douglas Mao and Rebecca Walkowitz in *Bad*

Modernisms, 2006), which articulates a need to open criticism to protean nature of modernist production in all of its forms. By examining modernism "in its original sites of production and in the continually shifting physicality of its texts and transmissions results in alternative constructions very different from current ones. Such views emphasize historical contingency, multiple versions, and the material features of the text itself" (*Material Modernism* 1). To collate multiple versions of a text is both an act of recovery and a way of constructing new meaning in our understanding of textual transmission.

The Modernist Versions Project is in a unique position to do this type of work since it is located in Canada. In Canada, a work enters the public domain fifty-years after the death of the author. This means that Canadian scholars may digitally reproduce and store material beyond the 1923 cut-off date in the United States as long as the material has entered the public domain in Canada. This allows us to do the acts of recovery outlined by Bornstein above, in the spirit of new modernist studies, as we attempt to recover the "protean" nature of modernist work by revealing and publishing multiple versions of the text. The classic example used by Bornstein to show the importance of collating modernist works is that of Marianne Moore and her poem "Poetry." The poem underwent three major revisions over time: it got smaller every time it was published. By collating Moore's work (as well as that of other moderns), scholars may reveal,

> the significance of the existence of such multiple versions: by displaying her poem in such radically different material forms, Moore creates not merely a series of variants but, more importantly, a physical enactment of the process of transmission of modernist poetry. (*Material Modernism* 35)

In this context, we undertook this current study to identify collation programs currently available to textual scholarship. We needed to know what the programs were, how the operated, and what type of collation and analysis we could perform with these tools.

Methodology

Ashlin Richardson (Computer Science doctoral student) was provided with two witnesses of Joseph Conrad's *Nostromo* in XML format (TEI-P5), prepared by Katie Tanigawa, and .txt files of *Ulysses*, prepared by Huculak, to use as constants in testing.

Richardson, a computer scientist, and Huculak, a literary scholar, realized they had dissimilar conceptual notions of collation due to the term's use in their respective fields. Richardson noted that the act of collation must remain distinct from the act of classification.

- Collation: "the assembly of written information into a standard order." We emphasize that Collation is the ordering of information; in contrast
- Classification (a related but distinct task) is "concerned with arranging information into logical categories" (Wikipedia).

According to the discussion of textual collation and computing systems presented in Hans Walter Gabler's "Notes on Collation," some fundamental activities requisite to textual collation are as follows:

- Grouping documents by their likenesses and identities
- Decomposing texts into smaller features (fragments)
- Searching based on image features and/or markup
- Registration of minute differences (and also similarities) between texts (and the parallel visualization between multiple documents)
- The output of "lemmatized apparatus lists"; i.e., automatically generated lists of coordinations between the above differences (and similarities).
- Construction of paths through collections of text materials by observing correspondences and/or correlations between features—we should expect the result of collation to be the principal (dominant/most significant/most comprehensive/ most persistent) of the above paths (robustness to highly divergent versions of text). The result is a sequence of "reference points" which constitute the progression of the "base text"; these reference points are used as explicit references for textual comparison between versions.
- Contextual visualization of all of the above: several methods of interleaving the coordinated information are possible (including side by side or columnar representations, horizontal line-by-line representations). Such vertical or horizontal representations may be elaborated through version-by-version stacking of the constituent features or, alternatively, by sequential agglutination - a representation of the collation result in a "sequential run-on" format. Agglutination refers to the activity of copying and merging of constituent features of the different textual versions, with respect to the reference points that are representative of the collation result.
- Interactive modification of the collation result allowing user feedback to improve the result, based on human modification of results. Such modification should allow textual regrouping operations, and/or modification of the "reference points" arrived at by collation.

- Representation/markup of ancillary information such as page numbering, layout, formatting, and/or illustration is also advantageous.
- Special treatment of, and the ability to select different processing options for: variations in white-space and other special characters, different types of character sets/textual encodings is requested.

Based on these collation activities, Huculak and Richardson developed the following questions to ask of the software under consideration:

- What collation tools and/or textual analysis tools are presently available in 2013?
- What do the collation tools available have in common? How do they differ? (A detailed "meta-collation" analysis should be performed, to ascertain the commonalities and differences of the collation tools that are available.)
- How many input data formats should collation/textual analysis tools support?
- What internal representations for textual data are supported?
- Specifically, what visualization methods are available for the visual representation of collation results?
- To enhance, support, and add flexibility/robustness to collation functionality, what visualization methods/algorithms are available for textual analysis in general?
- What visualization methods are available (or described) for user interaction with collation/textual analysis results, in particular, the user feedback and modification of collation results (through regrouping and/or modification of groups of text, and/or the reference points determined by collation)?
- How much user intervention should be necessary? What are the limits in terms of how automated collation/textual analysis might be?
- Users of software developed by the textual analysis community do not always possess a high degree of algorithmic fluency. Accordingly, the user documentation for textual analysis tools may not substantially reveal the "under-the-hood" details of the collation and/or other textual analysis algorithms involved. Furthermore, fully technical documentation may not be provided. Specifically, which algorithms are involved in contemporary textual analysis tools? Understanding of the underlying algorithms is extremely important, in order to be aware of the strengths and limitations of the approach.
- The algorithmic details should ideally be explained so that the strengths and limitations may be communicated to a non-specialist. Accordingly, can we present the algorithmic details simply, in plain English, in order to relate the strengths and limitations to the casual user?

After our testing of tools developed for literary scholarship is complete, we propose to ask the following questions in order to broaden our understanding of the field of collation across disciplines:

- What is the relationship between the algorithms (incl., e.g., protein sequence analysis, gene sequence analysis, spectral network analysis) used by the genetics/genomics/proteomics and/or mass spectrometry communities for data sequence alignment and analysis, and algorithms used for collation/textual analysis?
- Furthermore, above and beyond analysis of network structure within textual collections, what algorithms are available to make inferences about the network-based processes

(e.g., social phenomena) underlying the evolution and development of those textual works?

- Especially for collections of text that are extremely large (e.g., the internet, an entire library, or other large collections) we should expect the facilitation of robust collation functionality to be computationally expensive. Are textual analysis tools available within the distributed computing paradigm?
- What algorithms and visualization methods applicable to collation/textual analysis are available from the information technology and information theoretic disciplines (computer science, mathematics, data visualization, semantic analysis)? Fully hierarchical segmentation algorithms are just one example of methods to vastly enhance the visualization and analysis of collections of textual works (particularly those that are vast and/or divergent).
- What algorithms/methods are available to augment the collation/textual analysis tools available, with the aim of substantially improving and/or increasing the robustness of conventional collation tools, particularly for large, highly divergent and/or diverse collections of text) semantic analysis and/or other forms of situational awareness?

Summary of Testing:

- Programming Language: In what language/framework is the software programmed?
- Open Source: Is the software open source?
- Input: What input formats are accepted?
- Output: What output formats are generated?
- Interface: What type of interface does the program use (GUI, Command line, other)?
- Collation Algorithm: What algorithm is used (if provided)?
- Visualizations: How are results displayed?
- Web Service: Does application have API or other hook?
- Collation Type: Does the program use horizontal or vertical collation? (or both)
- Number of Files: How many files can be collated at once?
- Data Manipulation after Processing (ignore white space, etc.): Does the program allow for user input/manipulation during or after the collation process?
- Documentation: Why type of documentation accompanies the software?
- Installation Requirements: What are the hardware requirements for installation?
- Tool History: What is the history of the tool?
- Problems: What problems did we encounter during testing?
- Recommended: Do we recommend this tool for our specific use?
- Technical Experience: Roughly, how much user experience needed to install and run the software?
- Preprocessing Needed?: Does the user have to mark up text before processing?
- Features: What makes the software distinct?

Recommendations

Tools

JuxtaCommons provided the most robust, user-friendly environment in which to do collation. It is the ideal tool for beginners to become acquainted with collation since it allows users to upload various file formats and includes "point-and-click" functionality. Results can be visualized in the browser and shared via the web. JuxtaCommons also seems to be the most actively developed of the tools surveyed, and its team seems willing to adopt recommendations from its user-base. For example, a version of the Versioning Machine has been incorporated into the program so that viewers can choose VM as a visualization tool. JuxtaCommons also allows users to share data, which is quite useful when working across institutions. As an all-around tool for collation and visualization, JuxtaCommons provides the most advanced and easy-to-learn framework of the tools surveyed.

For general use, including work in the classroom, JuxtaCommons provides an easy way to collate texts and produce TEI P5 parallel segmentation.

In terms of documentation, JuxtaCommons could be more explicit in terms of the types of algorithms used, like the CollateX project, with which the Juxta group seems to collaborate. Also, when collating longer texts, JuxtaCommons takes some time to produce visualizations. We recommend that JuxtaCommons adopt a "status bar" so that users can track the progress of their work as it is collated.

CollateX also offers quite a robust framework in which to do collation work, but it requires more technical knowhow to operate and install. Its major strength is that it allows users to change collation algorithms, and it is extensively documented.

There are a few promising tools under development for collation, including the work of Desmond Schmidt at the AustESE project, and TEI :: TEXT :: COLLATE, whose clean code impressed Richardson as computer scientist. Richardson recommends that this program be supported since "The presentation of the code shows that it has good logical structure, and is highly modular, and entirely self-contained" (see page 38).

Observations

Explicitness

Our research shows that many programs lack explicitness in documentation in how they operate. The exception to this observation is the CollateX program, which has explicitly published which algorithms are used for collation. CollateX also takes the time to explain collation algorithms to the non-specialist. Moreover, CollateX allows users to change collation algorithms before processing. We recommend that all tool developers adopt this transparent approach to collation software.

Siloes

We also note that many projects have been developed in siloed environments. This is logical since most collation programs have been programmed with a specific project in mind. It may be useful to the community that we develop a common repository of collation software. This way, different projects can build on the successes and failures of previous projects in order to create more robust software.

Collaboration

One promising development we witnessed during our research was the collaboration between CollateX and JuxtaCommons in the development of their respective projects. Though each project has its own strengths, the developers of each project communicate with one another in order to build better products for the community at large. We hope this type of collaboration continues as these larger projects continue to develop.

Another point of collaboration we found useful was that between the English department and the Computer Science department. Huculak is familiar with the needs of textual critics and collation, and Richardson is a developer for other types of collation algorithms dealing with images. There is a lot of collation development work being done right now in terms of protein sequence analysis and genetics. Richardson suggests that the processes of collation in protein analysis are strikingly similar to that required by textual critics (both need to collate strings of letters). Richardson suggests that greater collaboration occurs between the Humanities and Computer Science since their interests overlap in this area.

Future Versioning

This survey examines currently existing collation tools and codex-based processing. Matthew Kirschenbaum is theorizing the work of version control systems (see *Mechanisms*). A new study of born-digital version control systems and collating born digital apparatuses might be useful to the community.

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Annex I: Results

Juxta-Commons & Juxta Desktop

www.juxtacommons.org

Programming Language: Java

Open Source: Yes. Source code available for web services API version and desktop version:

- https://github.com/performant-software/juxta-service
- https://github.com/performant-software/juxta-desktop

Input: Plain text, XML, HTML, DOCX, OpenOffice, EPUB, PDF files, Rossetti Archive Markup (RAM) XML, TEI XML, and TEI-P5 Parallel Segmentation formatted files

- http://www.tei-c.org/release/doc/tei-p5-doc/en/html/TC.html

Output: HTML, XML, TEI-P5 (incl. Parallel Segmentation), web URL to results hosted online, results sent via email, results shared via. iframe embed (facebook embed for social sharing of results coming soon).

Interface:

- Desktop: GUI application
- Online: Graphical web service

Collation Algorithm: For JuxtaCommons the collation algorithm is derived from CollateX (interedition.eu). Juxta (the desktop application) has its own collation algorithm (Schmidt) this is based on the algorithm presented in the monograph (Heckel).

Visualizations: several helpful visualizations (interactive annotation, heat map, histogram, parallel segmentation) and others are available. Please see the sample screen shots provided below.

Web Service: Web services API hooks are available (see above).

Collation Type: two-column side by side ("parallel segmentation").

Number of Files: 2-15 (which seems ample for practical purposes).

Data Manipulation after Processing (ignore white space, etc.): a couple of options are available.

Documentation: detailed. Documentation is provided with substantial detail, the system takes almost no effort to use in order to produce collation results, and straightforward visualizations are available (described at http://juxtacommons.org/guide). The collation algorithm is given some limited description within the documentation http://juxtacommons.org/tech_info but

Further algorithm information is available here:

- http://www.interedition.eu/wiki/index.php/About_microservices#Gothenburg_Model_and_Implementation
- And, detailed information should be available from the source code. Additional documentation and discussion available from developer group
    - https://groups.google.com/forum/#!forum/juxta-dev
- The collation algorithm itself is closely related to CollateX (from Interedition project).
    - http://collatex.net/about/
    - http://gregor.middell.net/collatex/api/collate

Installation Requirements: Web based client is offered. Thus, no installation is required.

Tool History: Developed by Applied Research in Patacriticism group at U. Virginia (Jerome McGann), Nick Laiacona of Performant Software, and Duane Gran, and Bethany Nowviskie.

Problems: None; Though some time is needed for longer texts to process. There is not a "status bar" to indicate the progress of collation.

Recommended: Yes

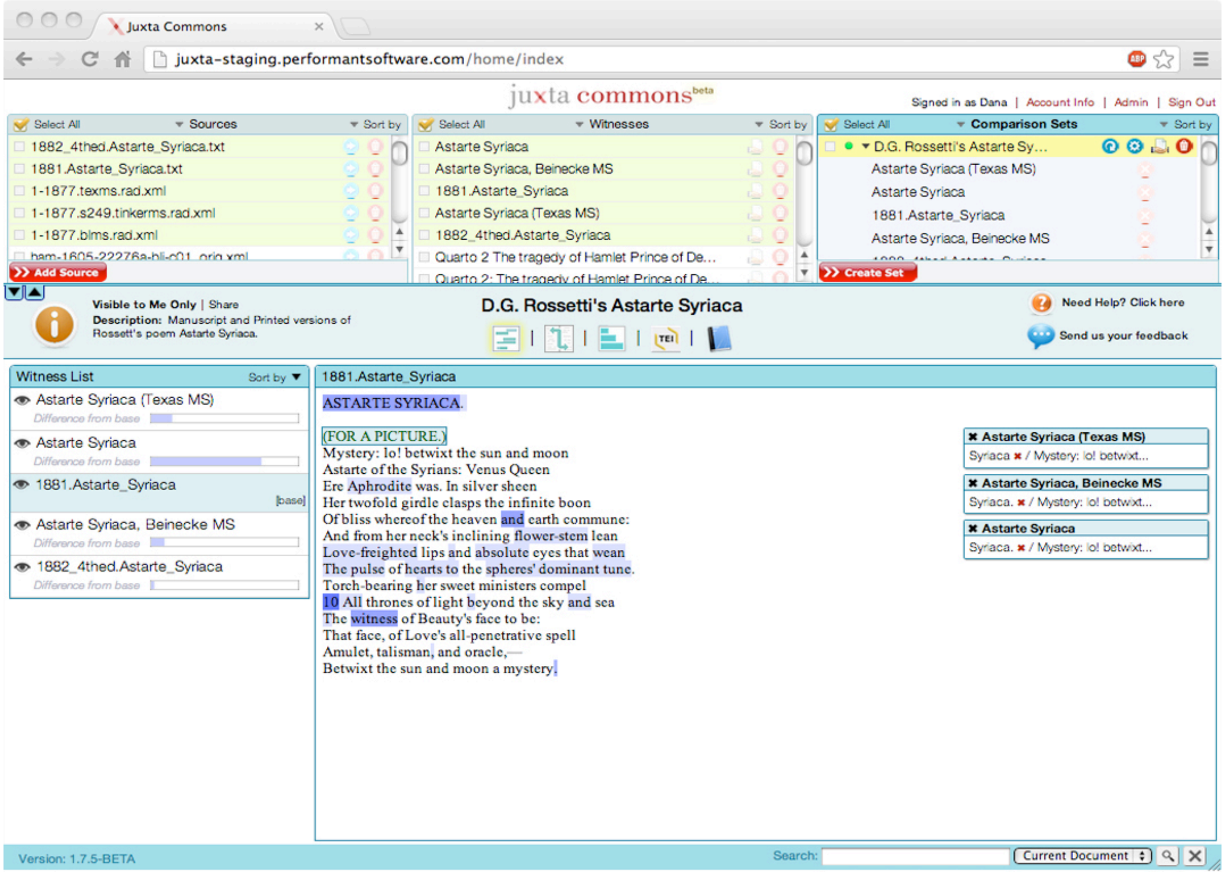
Technical Experience: not required. For developer-level functionality, software development experience required.

Preprocessing Needed: No.

Features: helpful settings relating to the treatment of punctuation and capitalization

Screenshots (short sample data)

Heat Map Visualization



Sources:

- 1882_4thed.Astarte_Syriaca.txt
- 1881.Astarte_Syriaca.txt
- 1-1877.texms.rad.xml
- 1-1877.s249.tinkerms.rad.xml
- 1-1877.blms.rad.xml
- ham-1605-22276a-bli-c01_orig.xml

Witnesses:

- Astarte Syriaca
- Astarte Syriaca, Beinecke MS
- 1881.Astarte_Syriaca
- Astarte Syriaca (Texas MS)
- 1882_4thed.Astarte_Syriaca
- Quarto 2 The tragedy of Hamlet Prince of De...
- Quarto 2: The tragedy of Hamlet Prince of De...

Comparison Sets:

- D.G. Rossetti's Astarte Sy...
  - Astarte Syriaca (Texas MS)
  - Astarte Syriaca
  - 1881.Astarte_Syriaca
  - Astarte Syriaca, Beinecke MS

Visible to Me Only | Share
Description: Manuscript and Printed versions of Rossett's poem Astarte Syriaca.

D.G. Rossetti's Astarte Syriaca

Witness List — Sort by

- Astarte Syriaca (Texas MS) — Difference from base
- Astarte Syriaca — Difference from base
- 1881.Astarte_Syriaca [base]
- Astarte Syriaca, Beinecke MS — Difference from base
- 1882_4thed.Astarte_Syriaca — Difference from base

1881.Astarte_Syriaca

ASTARTE SYRIACA.

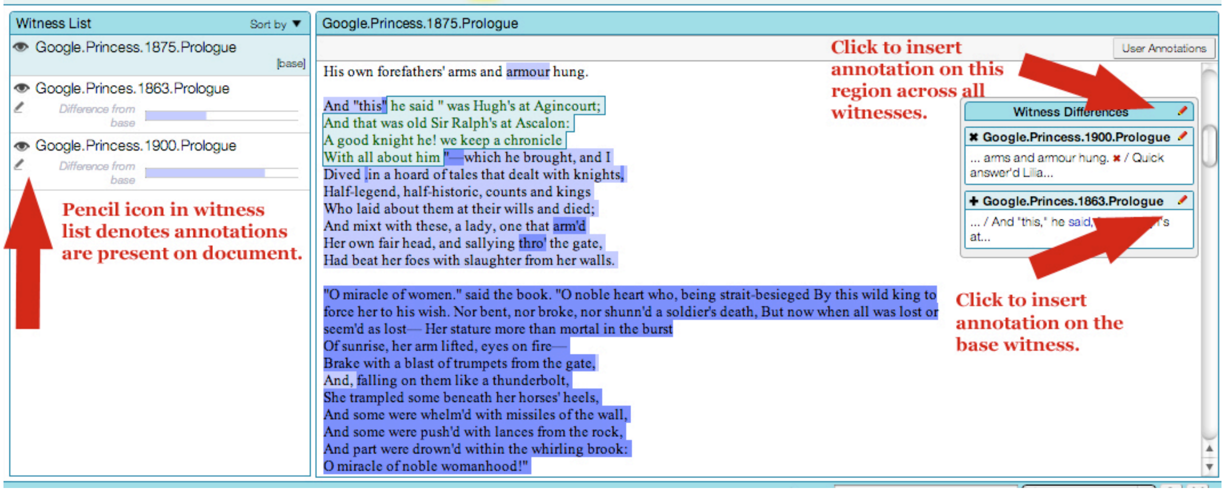
(FOR A PICTURE.)
Mystery: lo! betwixt the sun and moon
Astarte of the Syrians: Venus Queen
Ere Aphrodite was. In silver sheen
Her twofold girdle clasps the infinite boon
Of bliss whereof the heaven and earth commune:
And from her neck's inclining flower-stem lean
Love-freighted lips and absolute eyes that wean
The pulse of hearts to the spheres' dominant tune.
Torch-bearing her sweet ministers compel
10 All thrones of light beyond the sky and sea
The witness of Beauty's face to be:
That face, of Love's all-penetrative spell
Amulet, talisman, and oracle,—
Betwixt the sun and moon a mystery.

✖ Astarte Syriaca (Texas MS)
Syriaca ✖ / Mystery: lo! betwixt...

✖ Astarte Syriaca, Beinecke MS
Syriaca. ✖ / Mystery: lo! betwixt...

✖ Astarte Syriaca
Syriaca. ✖ / Mystery: lo! betwixt...

User Annotation Interactive Visualization



- Google.Princess.1875.Prologue [base]
- Google.Princes.1863.Prologue — Difference from base
- Google.Princess.1900.Prologue — Difference from base

Google.Princess.1875.Prologue

His own forefathers' arms and armour hung.

And "this" he said " was Hugh's at Agincourt;
And that was old Sir Ralph's at Ascalon:
A good knight he! we keep a chronicle
With all about him "—which he brought, and I
Dived ,in a hoard of tales that dealt with knights,
Half-legend, half-historic, counts and kings
Who laid about them at their wills and died;
And mixt with these, a lady, one that arm'd
Her own fair head, and sallying thro' the gate,
Had beat her foes with slaughter from her walls.

"O miracle of women." said the book. "O noble heart who, being strait-besieged By this wild king to force her to his wish. Nor bent, nor broke, nor shunn'd a soldier's death, But now when all was lost or seem'd as lost— Her stature more than mortal in the burst
Of sunrise, her arm lifted, eyes on fire—
Brake with a blast of trumpets from the gate,
And, falling on them like a thunderbolt,
She trampled some beneath her horses' heels,
And some were whelm'd with missiles of the wall,
And some were push'd with lances from the rock,
And part were drown'd within the whirling brook:
O miracle of noble womanhood!"

✖ Google.Princess.1900.Prologue
... arms and armour hung. ✖ / Quick answer'd Lilia...

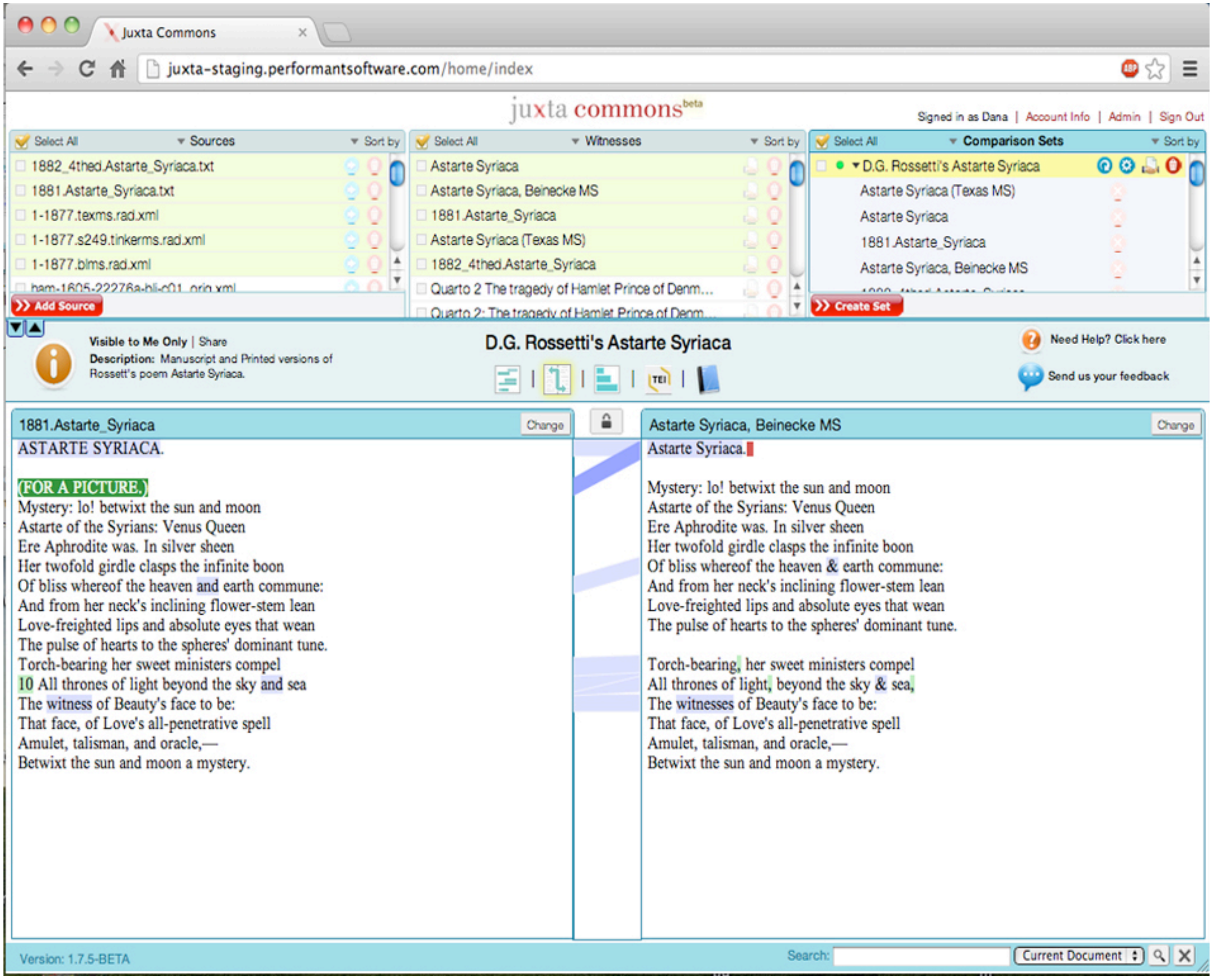
✚ Google.Princes.1863.Prologue
... / And "this," he said, ...'s at...

Click to insert annotation on this region across all witnesses.

Pencil icon in witness list denotes annotations are present on document.

Click to insert annotation on the base witness.

Side by Side Visualization



Sources:

- 1882_4thed.Astarte_Syriaca.txt
- 1881.Astarte_Syriaca.txt
- 1-1877.texms.rad.xml
- 1-1877.s249.tinkerms.rad.xml
- 1-1877.blms.rad.xml
- ham-1605-22276a-bli-c01_orig.xml

Witnesses:

- Astarte Syriaca
- Astarte Syriaca, Beinecke MS
- 1881.Astarte_Syriaca
- Astarte Syriaca (Texas MS)
- 1882_4thed.Astarte_Syriaca
- Quarto 2 The tragedy of Hamlet Prince of Denm...
- Quarto 2: The tragedy of Hamlet Prince of Denm...

Comparison Sets:

- D.G. Rossetti's Astarte Syriaca
  - Astarte Syriaca (Texas MS)
  - Astarte Syriaca
  - 1881.Astarte_Syriaca
  - Astarte Syriaca, Beinecke MS

Visible to Me Only | Share
Description: Manuscript and Printed versions of Rossett's poem Astarte Syriaca.

D.G. Rossetti's Astarte Syriaca

1881.Astarte_Syriaca

ASTARTE SYRIACA.

(FOR A PICTURE.)
Mystery: lo! betwixt the sun and moon
Astarte of the Syrians: Venus Queen
Ere Aphrodite was. In silver sheen
Her twofold girdle clasps the infinite boon
Of bliss whereof the heaven and earth commune:
And from her neck's inclining flower-stem lean
Love-freighted lips and absolute eyes that wean
The pulse of hearts to the spheres' dominant tune.
Torch-bearing her sweet ministers compel
10 All thrones of light beyond the sky and sea
The witness of Beauty's face to be:
That face, of Love's all-penetrative spell
Amulet, talisman, and oracle,—
Betwixt the sun and moon a mystery.

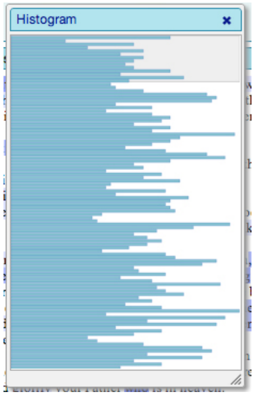
Astarte Syriaca, Beinecke MS

Astarte Syriaca.

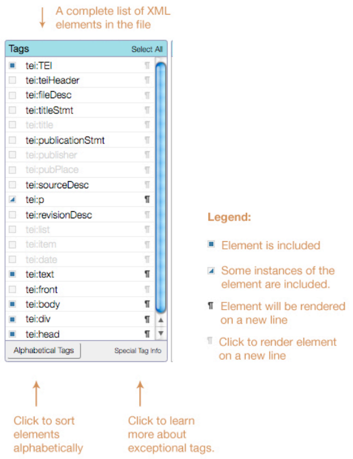
Mystery: lo! betwixt the sun and moon
Astarte of the Syrians: Venus Queen
Ere Aphrodite was. In silver sheen
Her twofold girdle clasps the infinite boon
Of bliss whereof the heaven & earth commune:
And from her neck's inclining flower-stem lean
Love-freighted lips and absolute eyes that wean
The pulse of hearts to the spheres' dominant tune.

Torch-bearing, her sweet ministers compel
All thrones of light, beyond the sky & sea,
The witnesses of Beauty's face to be:
That face, of Love's all-penetrative spell
Amulet, talisman, and oracle,—
Betwixt the sun and moon a mystery.

Histogram Visualization



TEI XML element visualization



A complete list of XML elements in the file

Legend:

■ Element is included

◪ Some instances of the element are included.

¶ Element will be rendered on a new line

¶ Click to render element on a new line

Click to sort elements alphabetically

Click to learn more about exceptional tags.

Ulysses Sample data: JuxtaCommons

Outputs from the *Ulysses* test files are conveniently made available online as part of the web service. In order to see the (full) output produced using the *Ulysses* test set, please see the links below.

Ulysses Text File Output – Heat Maps

Base Witness: Ulysses_1922_telemachiadplus1
http://juxtacommons.org/shares/ImlfNR

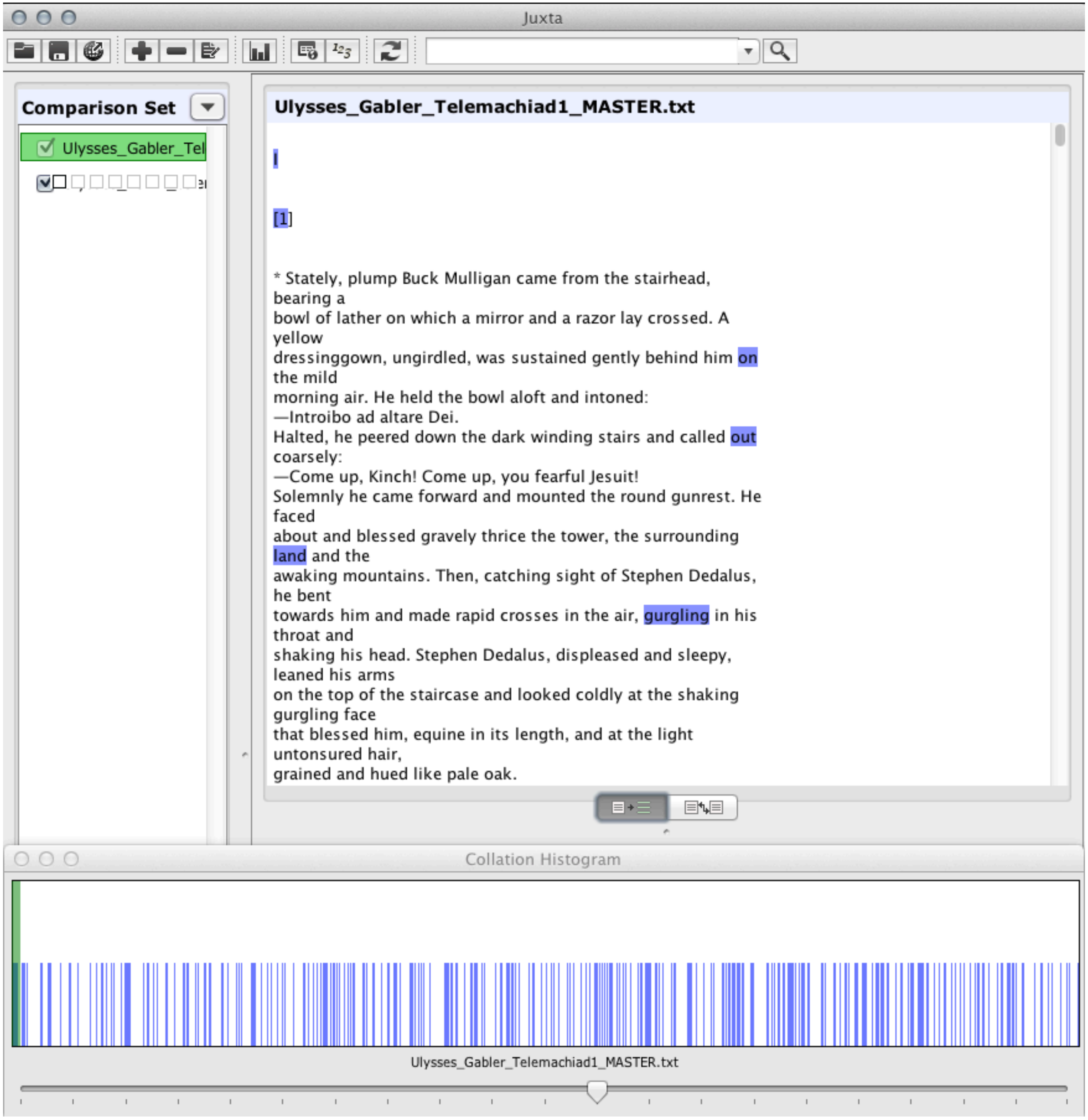
Base Witness: Ulysses_Gabler_Telemachiad1_MASTER
http://juxtacommons.org/shares/AXVpAk

Ulysses Text File Output – Side by Side Comparison

http://juxtacommons.org/shares/WJ7rQm

Ulysses Sample data: Juxta (Desktop Application)

Heat Map Base Witness: Ulysses_Gabler_Telemachiad1_MASTER



Ulysses_Gabler_Telemachiad1_MASTER.txt

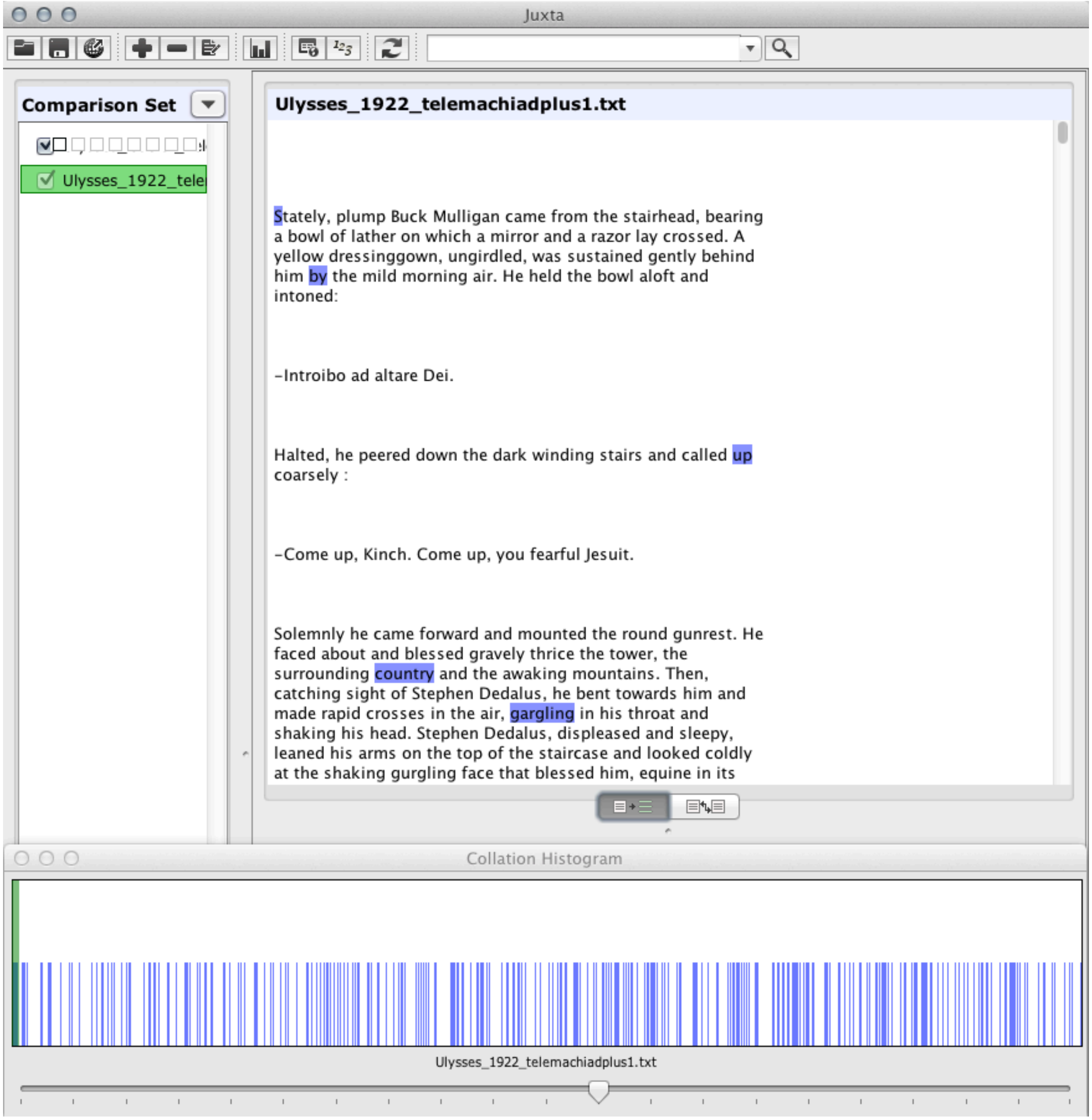
I

[1]

* Stately, plump Buck Mulligan came from the stairhead,
bearing a
bowl of lather on which a mirror and a razor lay crossed. A
yellow
dressinggown, ungirdled, was sustained gently behind him on
the mild
morning air. He held the bowl aloft and intoned:
—Introibo ad altare Dei.
Halted, he peered down the dark winding stairs and called out
coarsely:
—Come up, Kinch! Come up, you fearful Jesuit!
Solemnly he came forward and mounted the round gunrest. He
faced
about and blessed gravely thrice the tower, the surrounding
land and the
awaking mountains. Then, catching sight of Stephen Dedalus,
he bent
towards him and made rapid crosses in the air, gurgling in his
throat and
shaking his head. Stephen Dedalus, displeased and sleepy,
leaned his arms
on the top of the staircase and looked coldly at the shaking
gurgling face
that blessed him, equine in its length, and at the light
untonsured hair,
grained and hued like pale oak.

Ulysses_Gabler_Telemachiad1_MASTER.txt

Heat Map Base Witness: Ulysses_1922_telemachiadplus1


Juxta
Comparison Set
Ulysses_1922_tele
Ulysses_1922_telemachiadplus1.txt
Collation Histogram
Ulysses_1922_telemachiadplus1.txt

Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on which a mirror and a razor lay crossed. A yellow dressinggown, ungirdled, was sustained gently behind him by the mild morning air. He held the bowl aloft and intoned:

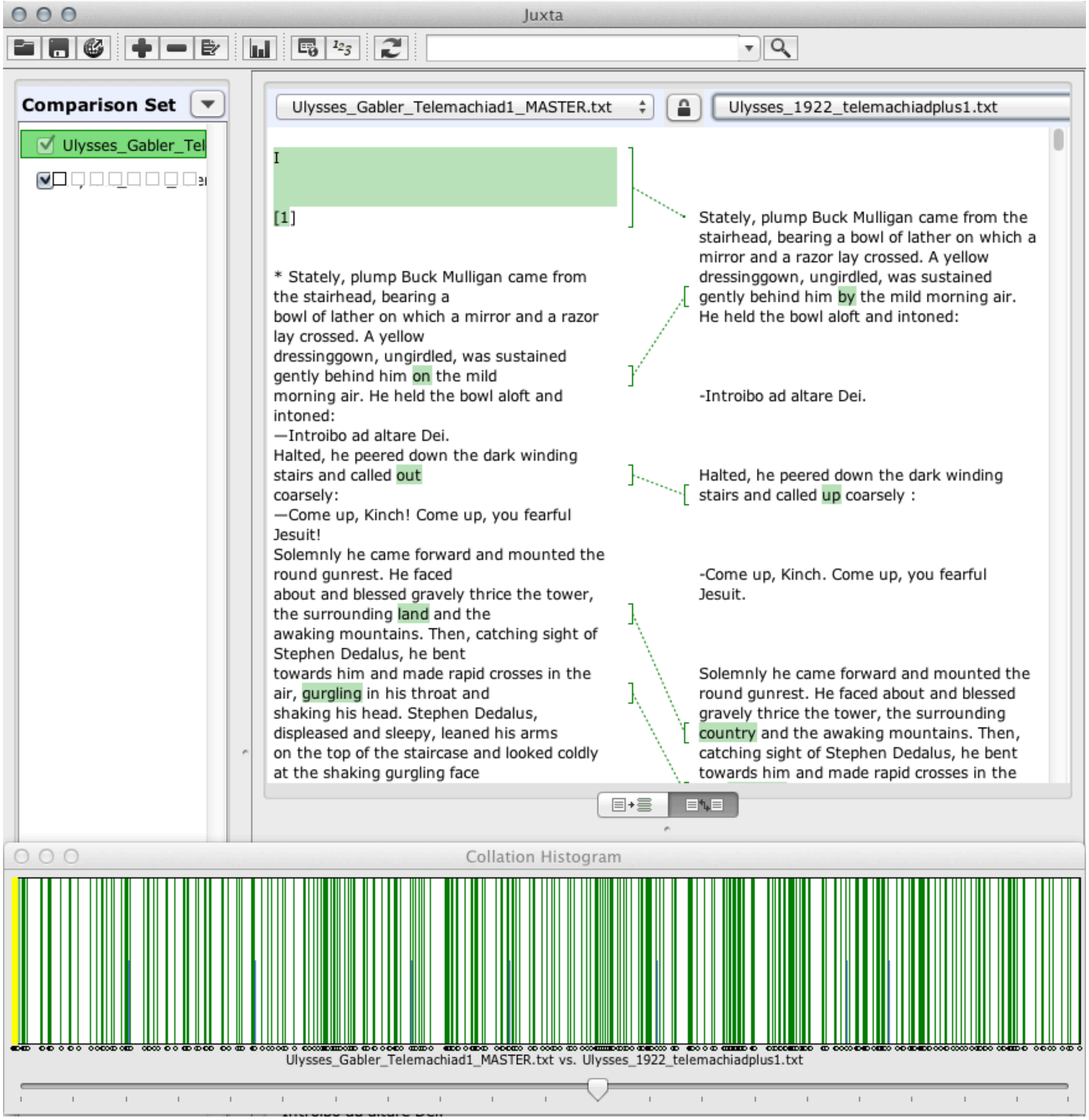
–Introibo ad altare Dei.

Halted, he peered down the dark winding stairs and called up coarsely :

–Come up, Kinch. Come up, you fearful Jesuit.

Solemnly he came forward and mounted the round gunrest. He faced about and blessed gravely thrice the tower, the surrounding country and the awaking mountains. Then, catching sight of Stephen Dedalus, he bent towards him and made rapid crosses in the air, gargling in his throat and shaking his head. Stephen Dedalus, displeased and sleepy, leaned his arms on the top of the staircase and looked coldly at the shaking gurgling face that blessed him, equine in its

Side-by-Side Comparison



Ulysses_Gabler_Tel

Ulysses_Gabler_Telemachiad1_MASTER.txt

Ulysses_1922_telemachiadplus1.txt

I

[1]

* Stately, plump Buck Mulligan came from
the stairhead, bearing a
bowl of lather on which a mirror and a razor
lay crossed. A yellow
dressinggown, ungirdled, was sustained
gently behind him on the mild
morning air. He held the bowl aloft and
intoned:
—Introibo ad altare Dei.
Halted, he peered down the dark winding
stairs and called out
coarsely:
—Come up, Kinch! Come up, you fearful
Jesuit!
Solemnly he came forward and mounted the
round gunrest. He faced
about and blessed gravely thrice the tower,
the surrounding land and the
awaking mountains. Then, catching sight of
Stephen Dedalus, he bent
towards him and made rapid crosses in the
air, gurgling in his throat and
shaking his head. Stephen Dedalus,
displeased and sleepy, leaned his arms
on the top of the staircase and looked coldly
at the shaking gurgling face

Stately, plump Buck Mulligan came from the
stairhead, bearing a bowl of lather on which a
mirror and a razor lay crossed. A yellow
dressinggown, ungirdled, was sustained
gently behind him by the mild morning air.
He held the bowl aloft and intoned:

-Introibo ad altare Dei.

Halted, he peered down the dark winding
stairs and called up coarsely :

-Come up, Kinch. Come up, you fearful
Jesuit.

Solemnly he came forward and mounted the
round gunrest. He faced about and blessed
gravely thrice the tower, the surrounding
country and the awaking mountains. Then,
catching sight of Stephen Dedalus, he bent
towards him and made rapid crosses in the

Ulysses_Gabler_Telemachiad1_MASTER.txt vs. Ulysses_1922_telemachiadplus1.txt

TUSTEP

Programming Language: Fortran, C

Open Source: Yes: http://www.tustep.uni-tuebingen.de/down/accept.php
http://www.tustep.uni-tuebingen.de/tustep_eng.html
http://www.tustep.uni-tuebingen.de/tustep_eng11.html

Input: Plain text (ASCII), Magnetic Tape Cassette Format

Output: Plain text, Magnetic Tape Cassette Format

Interface: A command line and scripting language interface. To get an idea for the proprietary technical opacity of the programming/software paradigms involved, a sample screenshot of a text-processing script is provided (please see the following section on TXSTEP).

Collation Algorithm: Has a "collation" function, developed as a module, although many parameters are required for this function, which are provided in a list with alphabetical index. The collation function does not calculate differences between versions (the user must supply the differences in a separate file, which can be generated using a separate script, which is included in TUSTEP). Not readily apparent from the English documentation whether a "collation sample" script is available.

Visualizations: None (text only interface).

Web Service: According to http://www.tustep.uni-tuebingen.de/tustep_eng.html, TuStep is available from the TextGrid environment (a Web service). However, at http://www.textgrid.de/, TuStep is listed in none of the following:

- TextGrid handbook https://textgrid.sub.uni-goettingen.de/fileadmin/dokumentation/user-manual-2.pdf,
- Technical documentation https://dev2.dariah.eu/wiki/display/TextGrid/Main+Page#MainPage-TechnicalDocumentation,
- Online help https://dev2.dariah.eu/wiki/display/TextGrid/Main+Page.

Interestingly, under Philological tools, at

- https://dev2.dariah.eu/wiki/display/TextGrid/Philological+Tools, collateX (collatex.sourceforge.net) is listed (CollateX is developed as part of the EU-funded Interedition project http://www.interedition.eu/, via http://collatex.net/about/, open source development is available through github: https://github.com/interedition/collatex). The latter version is actively maintained, whereas the http://collatex.sourceforge.net/team-list.html version has not been updated since 2011.

Collation Type: line-by-line

Number of Files: Several

Data Manipulation after Processing (ignore white space, etc.): In the 612-page manual, numerous programming options for processing and text formatting are available.

Documentation:
Detailed documentation is available in German, e.g.,

- http://www.tustep.uni-tuebingen.de/tustep_eng.html
- http://tustep.wikispaces.com/TUSTEP-Wiki
- http://rosettacode.org/wiki/Category:TUSCRIPT
- Documentation of limited scope is available in English. This does not include examples.
- http://www.tustep.uni-tuebingen.de/pdf/hdb93_eng.pdf

Installation Requirements:

- Fortran compiler and C compiler must be installed.
- Path to Fortran Compiler and C compiler must be provided to the installation program.
- Windows or Linux instructions are given for installation (in German).
- Examples for use included with the installation are limited and/or have limited documentation.

Tool History: The system has been developed at the university of Tubingen since the 1960s.

Problems: Many issues (see below).

Recommended: No.

Technical Experience: An advanced level of technical experience is required to run the software. To perform collation, apart from an understanding of the scripting environment (which is covered in an 612 page English manual from 1993), the user needs to understand the command syntax to load/import/convert data files. Furthermore, the required “COMPARE” and “COLLATE” commands each have technical options which are more than several in number, and probably too complicated for the non-specialist.

Preprocessing Needed: As indicated by the English language handbook, the amount of user intervention/preprocessing needed in the differencing command “COMPARE” (required as input to the command “COLLATE”) is unclear, as the document for “COMPARE” states “the program can handle omissions and insertions of any length, provided these are identified and indicated by the user”. This suggests that the automatic collation functionality is complicated and, user intervention/mark-up will be required to indicate correspondences between versions.

Features:

- Good text manipulation functions are available. This does not necessarily serve any advantage over other programming environments (such as, Python).
- Flexibility to change character set.
- Pattern matching functionality.
- Good flexibility of indexing features.

- Collation algorithm is present, although the documentation suggests it is outdated (in comparison to newer languages).
- Generation of word frequency lists is available (probably easier to compute this in a modern programming environment, such as Python).

Note: these features are only readily available to the TUSTEP/TUSCRIPT specialist.

Comments:
In computing terms, this is an archaic system, most of which consists of features that any standard operating system should be responsible for (e.g., executing a sequence of commands, querying the time, opening, closing, reading and writing text files, copying and pasting text, indexing, sorting, operations for manipulating data on magnetic cassette tapes).

Does have collation utility, but this is extremely difficult to use (requires that the user learn the TUSTEP language, which, again, is mostly representative of functionality present in any normal operating system).

Given the requisite investment in terms of programming learning curve, a user would have a vastly more fruitful experience to learn any modern high-level computing language, e.g., a scripting language such as PYTHON, rather than learn TUSTEP, because little additional functionality is gained from TUSTEP. TUSTEP lacks visualization (which modern high-level computing languages can readily offer). In conclusion, we suggest that use or further testing of this software package would be counterproductive.

TXSTEP

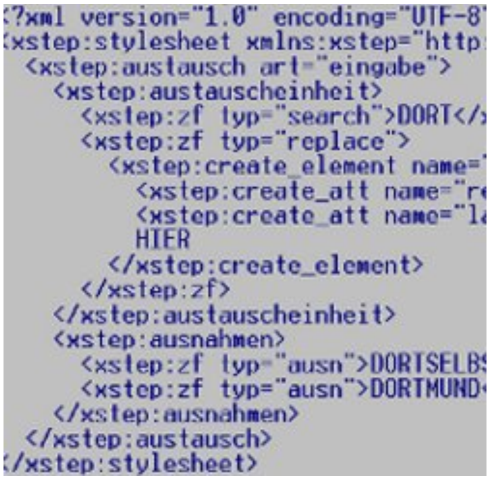
Programming Language: XML, TUSTEP scripts. Since TXSTEP is a really a front-end to TUSTEP, the programming languages involved are XML, TUSTEP, C, and Fortran.

Open Source: Yes. Prototype available for download from http://www.tustep.uni-tuebingen.de/down/txstep_1205/

Input: plain text, XML, HTML, TUSTEP, RTF, PS, Word, and Excel formats.

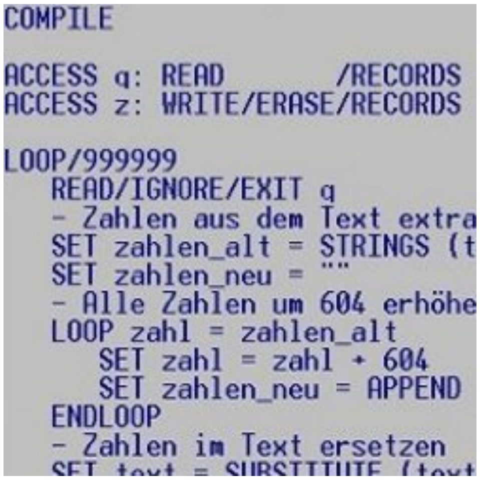
Output: plain text, XML, HTML, TUSTEP, RTF, PS, Word, and Excel formats.

Interface: XML script input (below, left). Whether this will prove to be self-explanatory than the TUSTEP/TUSCRIPT scripting environment, remains to be seen.



```
<?xml version="1.0" encoding="UTF-8
<xstep:stylesheet xmlns:xstep="http:
  <xstep:austausch art="eingabe">
    <xstep:austauscheinheit>
      <xstep:zf typ="search">DORT</x
      <xstep:zf typ="replace">
        <xstep:create_element name="
          <xstep:create_att name="re
          <xstep:create_att name="la
          HIER
        </xstep:create_element>
      </xstep:zf>
    </xstep:austauscheinheit>
    <xstep:ausnahmen>
      <xstep:zf typ="ausn">DORTSELBS
      <xstep:zf typ="ausn">DORTMUND<
    </xstep:ausnahmen>
  </xstep:austausch>
</xstep:stylesheet>
```

Figure 1: XML interface (TXSTEP)



```
COMPILE

ACCESS q: READ        /RECORDS
ACCESS z: WRITE/ERASE/RECORDS

LOOP/999999
   READ/IGNORE/EXIT q
   - Zahlen aus dem Text extra
   SET zahlen_alt = STRINGS (t
   SET zahlen_neu = ""
   - Alle Zahlen um 604 erhöhe
   LOOP zahl = zahlen_alt
      SET zahl = zahl + 604
      SET zahlen_neu = APPEND
   ENDLOOP
   - Zahlen im Text ersetzen
   SET text = SUBSTITUTE (text
```

Figure 2: TUSTEP/TUSCRIPT interface

These screenshots were taken from http://www.itug.de/2010/Wuerzburg/wue2010.html.

Collation Algorithm: TUSTEP collation algorithm.

Visualizations: text-based output. No visual representation.

Web Service: web-services not provided. Strictly speaking, TXSTEP is an XML-based API/hook for TUSTEP. Not configured or designed for web-deployment.

Collation Type: line-by-line.

Number of Files: several (as is subject to the limitations of TUSTEP, as above).

Data Manipulation after Processing (ignore white space, etc.): the extremely limited English documentation available does not convey anything about the extent to which text-manipulation functions from TUSTEP are made available in the XML interface, however, the German documentation indicates that detailed text-manipulation functions are available.

Documentation: English documentation is lacking. The main “current” project page is:

- http://www.tustep.uni-tuebingen.de/txstep_eng.html
- http://www.tustep.uni-tuebingen.de/tustep_eng.html

The “current” TXSTEP project page is listed at the above site. Installation instructions for Windows environment are provided:

- http://www.tustep.uni-tuebingen.de/down/txstep_1205/readme_eng.txt

However, it is not clear how to satisfy all the dependencies (the installation of freely available command-line C and Fortran compilers are typically much simpler for Unix/Linux or Mac OS environments). For the prototype, rather limited documentation is available in German.

Installation Requirements: requires installation and configuration of:

- C compiler, such as the open/free compiler “gcc” available from gcc.gnu.org,
- A Fortran Compiler, e.g., the open/free Fortran compiler from gcc.gnu.org/fortran/ provided as part of the “gcc” family of utilities.
- TUSTEP from http://www.tustep.uni-tuebingen.de/tustep_eng.html
- An XML editor such as oXygen http://www.oxygenxml.com is suggested/recommended (not a free product). Single user academic license for oXygen is $99 ($297 for academic single-user floating, classroom license $809, academic department license $3428, academic site license $8,380). If oXygen is not available (for which instructions are available), German instructions are available to execute TUSTEP software from the Windows Command Line.

Tool History:

TXSTEP was conceived in 2009 by Tobias Ott, an academic at Stuttgart Media University (also CEO of pagina GmbH in Tubingen) and presented at 2010 TUSTEP workshop in January 2010 at Trier University. The first developer’s workshop took place in May 2010 at Stuttgart Media University. The first prototype and status report were presented at the 2010 annual meeting of the International TUSTEP User Group (ITUG). The integration of further functions and functionality remains unclear. Currently, very little documentation is available for the prototype, so an evaluation of the features is not substantially possible.

Problems:

- Despite claims from the English introduction found on http://tustep.wikispaces.com/TXSTEP, the interface is not (yet) self-explanatory.
- Although the XML-based interface is an English-based scripting language, there is no English-based description of it.
- It is not yet clear how the XML-based interface corresponds to TUSTEP or what features of TUSTEP are integrated so far.
- So far, German language proficiency is required to conduct the demonstrations provided.
- Complete German documentation is not available either. E.g., the prototype being distributed does not contain a complete explanation of the file structure, or a substantially

complete description of the components, or their interrelationships. A simple listing of the XML-based examples is given in German.

- Although sample XML files are made available, they are sparsely documented (via comments made in German). Proper documentation of the examples is not present.
- Taking the claim of integration into oXygen and other XML editors into the context of other information, such as the state of available documentation, it seems likely that the proprietary editor oXygen will be, in effect, a de facto requirement (if the user is to realize the proposed advantages of TXSTEP).
- While an honest and genuine effort to bring a 35+ year old historical platform based on legacy-code (i.e., TUSTEP) to modernity the number of dependencies is quite large, the basis on the legacy-code structure remains.
- Current project status, available from http://www.tustep.uni-tuebingen.de/txstep_eng.html, has not been updated since July 2012.
- According to the above link, it is not clear that the indication (to release an updated version, incl. corrections, following the DH2012 meeting in July 2012) was carried out.

Recommended: Not yet. We hope that we may be able to recommend the software for users, as the flexibility of text processing offered by the system seems promising, only if improvements to the prototype become available, including adequate and sufficient documentation in English that substantially validating the developers' goals to create a self-evident interface. Claims at http://tustep.wikispaces.com/TUSTEP and elsewhere asserting that TUSCRIPT (the TUSTEP scripting language) is a modern scripting environment have not been validated (the very existence of the TXSTEP interface rules out this possibility. Indeed, from http://rosettacode.org/wiki/Category:TUSCRIPT_examples_needing_attention the admission that the examples for TUSCRIPT "may be incorrect, poorly-written…" or otherwise "…unsatisfactory", suggests that the stated modernization goals represented by TXSTEP may be made with great difficulty, if it is so deeply rooted in a technically dated predecessor.

Technical Experience: Unless substantial documentation is made available, currently an expert level of technical experience is required to install and operate the examples. For native German speakers who can follow the limited documentation, the level of technical experience is somewhat less.

Preprocessing Needed: Not required, at least for the text-processing examples supplied. Although sample scripts are provided to compute TEI-compliant differencing, it is not clear from the documentation whether a text-collation example was provided with the prototype, or if instructions were given on how to carry out a collation procedure.

Features: As in TUSTEP, there is the potential for a number of beneficial features:

- Good text manipulation.
- Flexibility to change character set.
- Pattern matching functionality.
- Flexibility of indexing features.
- Collation algorithm is present.
- Generation of word frequency lists.

Note: it is not clear whether all of these features from TUSTEP are in fact implemented in TXSTEP.   Again, none of these features are necessarily advantageous (see the comment on TUSTEP features, above).

TEI Comparator

Programming Language: java web application built using the Google Web Toolkit API

Open Source: Yes

Input: XML (designed to work with XML conforming to TEI guidelines, will work with any XML file).

Output: TEI (including user annotations)

Interface: Command Line

Collation Algorithm: Shingle Cloud Algorithm

Visualizations: Yes, for user annotation functionality only.

Web Service: Yes, but you have to set it up yourself (configuration is difficult).

Collation Type: Heat Map.

Number of Files: Compare two editions only

Data Manipulation after Processing (ignore white space, etc.): Yes, in GUI

Documentation (not detailed or detailed): Detailed**.** http://sourceforge.net/apps/mediawiki/tei-comparator/index.php?title=Main_Page

Installation Requirements: Difficult installation process involving setup for: Database, web server (manual editing of Configuration files).

Tool History: Developed for the Holinshed Project

Problems: Security issues (see below)

Recommended: No

Technical Experience: High (see below)

Preprocessing Needed? Yes

Problems:

- Database-backed. The requirement of the database feature requires installation of a database, incl. a web server (this process is complicated, requiring numerous configuration steps, and potentially leaves the machine open to vulnerabilities/exploits).

- Algorithm is not explicitly described.

Features:

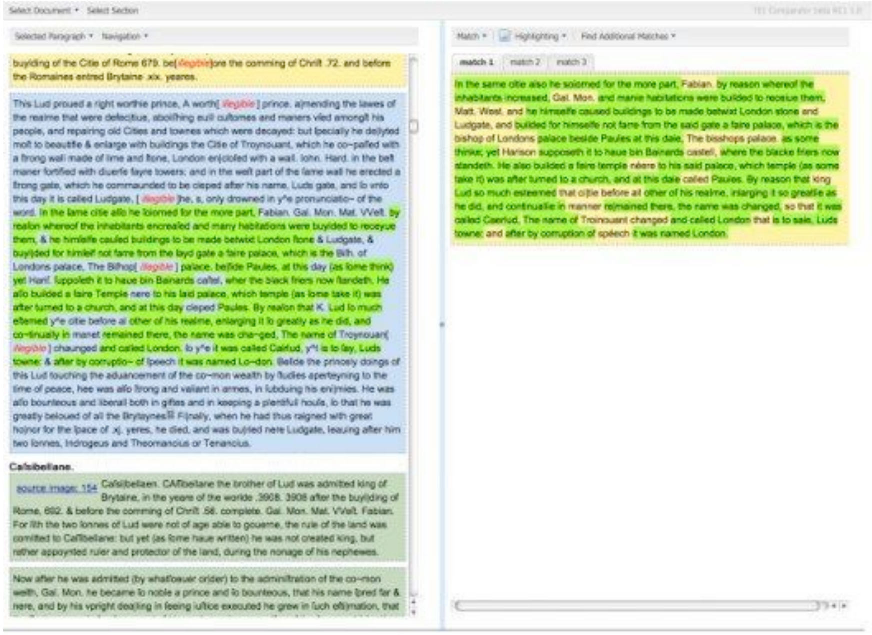
- Has a good wiki-style documentation here that is substantial and meaningful. While the details on the alignment algorithm called the Shingle Cloud Algorithm, are scarce on the WIKI, the details are presented clearly in the developer paper (please see references), which is an important reference (that should be consulted for references to other alignment approaches).
- The algorithm is "fast", but it requires pre-processing. First and foremost, user annotation/markup is required as pre-processing.
- The matching operates on a coarse level, so lots of user feedback may be required.
- The graphical interface is only available for visualization/user annotation
- Algorithm is run on a multi-step, command line basis.
- For the Hollinshed Project, the parameters for the command line processes were determined using statistical methods (which were not made available as part of the project).
- The description of the applicability of the algorithm is unsystematic: it "should work with any XML as long as the units being compared are of a similar paragraph-like size" here.
- Requires computer science degree to edit several configuration file settings, and run (too many) different tools: 1) ant buildscript 2) mysql 3) apache tomcat. Setup requires manually editing file names, and configuration of each tool by the command line.
- Web interface allows user to confirm/delete proposed matches, create matches, and annotate individual items (or annotate the link present between two items that match).

Conclusion: The installation of the software requires an advanced degree of technical user intervention, the web-based/database requirement introduces security/user access issues, and the matching must be pre-annotated. As is evident from the screen capture below, the software has similar (spectral-visualization of differences) functionality to JuxtaCommons, but the matching requires user intervention.

JuxtaCommons has eclipsed this software in functionality.

Screenshots: Short data sample

Showing a match



buylding of the Citie of Rome 679. be[illegible]ore the comming of Chriſt .72. and before the Romaines entred Brytaine .xix. yeares.

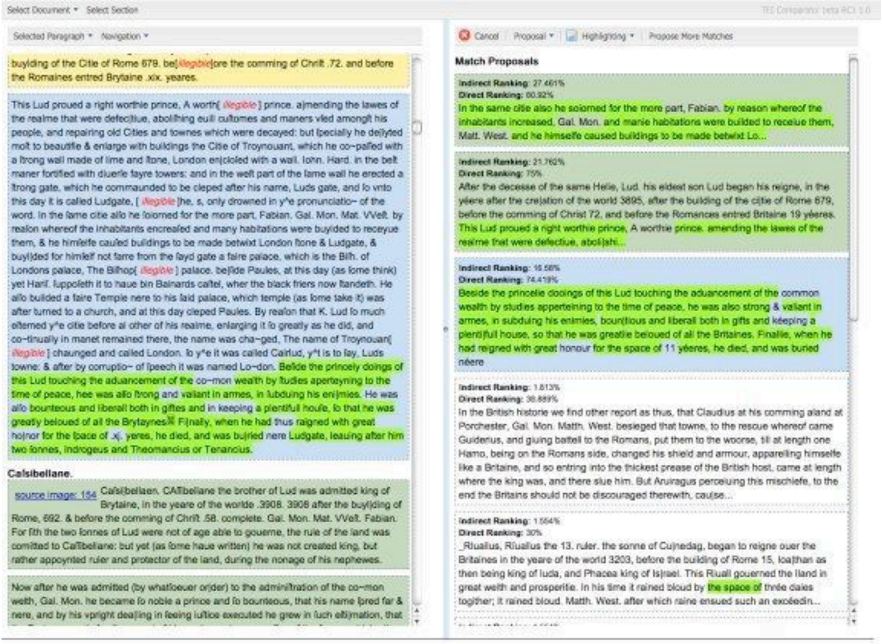
This Lud proued a right worthie prince, A worth[illegible] prince. a]mending the lawes of the realme that were defectiue, aboliſhing euill cuſtomes and maners vſed amongſt his people, and repairing old Cities and townes which were decayed: but ſpecially he de|lyted moſt to beautifie & enlarge with buildings the Citie of Troynouant, which he co~paſſed with a ſtrong wall made of lime and ſtone, London en|cloſed with a wall. Iohn. Hard. in the beſt maner fortified with diuerſe fayre towers: and in the weſt part of the ſame wall he erected a ſtrong gate, which he commaunded to be cleped after his name, Luds gate, and ſo vnto this day it is called Ludgate, [illegible]he, s, only drowned in y^e pronunciatio~ of the word. In the ſame citie alſo he ſoiorned for the more part. Fabian. Gal. Mon. Mat. VVeſt. by reaſon whereof the inhabitants encreaſed and many habitations were buylded to receyue them, & he himſelfe cauſed buildings to be made betwixt London ſtone & Ludgate, & buyl|ded for himſelf not farre from the ſayd gate a faire palace, which is the Biſh. of Londons palace. The Biſhop[illegible] palace. beſide Paules, at this day (as ſome think) yet Harriſ. ſuppoſeth it to haue bin Bainards caſtel, wher the black friers now ſtandeth. He alſo builded a faire Temple nere to his ſaid palace, which temple (as ſome take it) was after turned to a church, and at this day cleped Paules. By reaſon that K. Lud ſo much eſtemed y^e citie before al other of his realme, enlarging it ſo greatly as he did, and co~tinually in manet remained there, the name was cha~ged, The name of Troynouan[illegible] chaunged and called London. ſo y^e it was called Cairlud, y^t is to ſay, Luds towne: & after by corruptio~ of ſpeech it was named Lo~don. Beſide the princely doings of this Lud touching the aduancement of the co~mon wealth by ſtudies aperteyning to the time of peace, hee was alſo ſtrong and valiant in armes, in ſubduing his en|mies. He was alſo bounteous and liberall both in giftes and in keeping a plentifull houſe, ſo that he was greatly beloued of all the Brytaynes▯ Fi|nally, when he had thus raigned with great ho|nor for the ſpace of .xj. yeres, he died, and was bu|ried nere Ludgate, leauing after him two ſonnes, Indrogeus and Theomancius or Tenancius.

Caſsibellane.

source image: 154 Caſsibellaen. CAſſibellane the brother of Lud was admitted king of Brytaine, in the yeare of the worlde .3908. 3908 after the buylding of Rome, 692. & before the comming of Chriſt .58. complete. Gal. Mon. Mat. VVeſt. Fabian. For ſith the two ſonnes of Lud were not of age able to gouerne, the rule of the land was comitted to Caſſibellane: but yet (as ſome haue written) he was not created king, but rather appoynted ruler and protector of the land, during the nonage of his nephewes.

Now after he was admitted (by whatſoeuer or|der) to the adminiſtration of the co~mon welth, Gal. Mon. he became ſo noble a prince and ſo bounteous, that his name ſpred far & nere, and by his vpright dea|ling in ſeeing iuſtice executed he grew in ſuch eſti|mation, that

In the same citie also he soiorned for the more part, Fabian. by reason whereof the inhabitants increased, Gal. Mon. and manie habitations were builded to receiue them, Matt. West. and he himselfe caused buildings to be made betwixt London stone and Ludgate, and builded for himselfe not farre from the said gate a faire palace, which is the bishop of Londons palace beside Paules at this daie, The bisshops palace. as some thinke, yet Harison supposeth it to haue bin Bainards castell, where the blacke friers now standeth. He also builded a faire temple néere to his said palace, which temple (as some take it) was after turned to a church, and at this daie called Paules. By reason that king Lud so much esteemed that ci|tie before all other of his realme, inlarging it so greatlie as he did, and continuallie in manner re|mained there, the name was changed, so that it was called Caerlud, The name of Troinouant changed and called London that is to saie, Luds towne: and after by corruption of spéech it was named London.



buylding of the Citie of Rome 679. be[illegible]ore the comming of Chriſt .72. and before the Romaines entred Brytaine .xix. yeares.

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Caſsibellane.

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Match Proposals

Indirect Ranking: 27.461%
Direct Ranking: 60.32%
In the same citie also he soiorned for the more part, Fabian. by reason whereof the inhabitants increased, Gal. Mon. and manie habitations were builded to receiue them, Matt. West. and he himselfe caused buildings to be made betwixt Lo...

Indirect Ranking: 21.762%
Direct Ranking: 75%
After the decease of the same Helie, Lud. his eldest son Lud began his reigne, in the yéere after the cre|ation of the world 3895, after the building of the ci|tie of Rome 679, before the comming of Christ 72, and before the Romances entred Britaine 19 yéeres. This Lud proued a right worthie prince, A worthie prince. amending the lawes of the realme that were defectiue, aboli|shi...

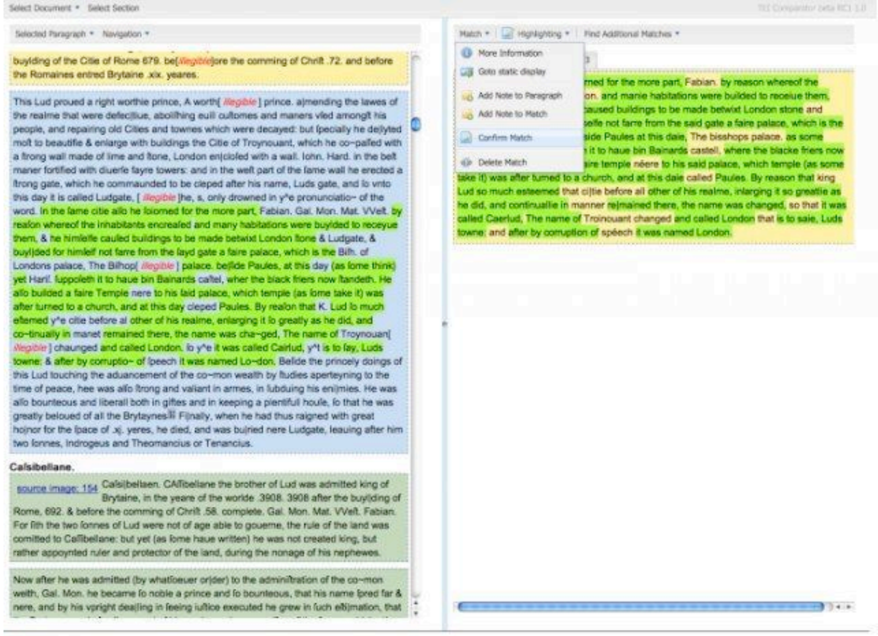
Indirect Ranking: 16.58%
Direct Ranking: 74.419%
Beside the princelie doings of this Lud touching the aduancement of the common wealth by studies apperteining to the time of peace, he was also strong & valiant in armes, in subduing his enimies, boun|tious and liberall both in gifts and kéeping a plenti|full house, so that he was greatlie beloued of all the Britaines. Finallie, when he had reigned with great honour for the space of 11 yéeres, he died, and was buried néere

Indirect Ranking: 1.813%
Direct Ranking: 38.889%
In the British historie we find other report as thus, that Claudius at his comming aland at Porchester, Gal. Mon. Matth. West. besieged that towne, to the rescue whereof came Guiderius, and giuing battell to the Romans, put them to the woorse, till at length one Hamo, being on the Romans side, changed his shield and armour, apparelling himselfe like a Britaine, and so entring into the thickest prease of the British host, came at length where the king was, and there slue him. But Aruiragus perceiuing this mischiefe, to the end the Britains should not be discouraged therewith, cau|se...

Indirect Ranking: 1.554%
Direct Ranking: 30%
_Riuallus, Riuallus the 13. ruler. the sonne of Cu|nedag, began to reigne ouer the Britaines in the yeare of the world 3203, before the building of Rome 15, Ioa|than as then being king of Iuda, and Phacea king of Is|rael. This Riuall gouerned the lland in great welth and prosperitie. In his time it rained bloud by the space of thrée daies togither; it rained bloud. Matth. West. after which raine ensued such an excéedin...

Proposing more matches

Confirming a match


Select Document ▾ Select Section
TEI Comparator beta RC1 1.0
Selected Paragraph ▾ Navigation ▾
Match ▾ Highlighting ▾ Find Additional Matches ▾
More Information
Goto static display
Add Note to Paragraph
Add Note to Match
Confirm Match
Delete Match

buylding of the Citie of Rome 679. be[illegible]ore the comming of Chriſt .72. and before the Romaines entred Brytaine .xix. yeares.

This Lud proued a right worthie prince, A worth[illegible] prince. a]mending the lawes of the realme that were defec]tiue, aboliſhing euill cuſtomes and maners vſed amongſt his people, and repairing old Cities and townes which were decayed: but ſpecially he de]lyted moſt to beautifie & enlarge with buildings the Citie of Troynouant, which he co~paſſed with a ſtrong wall made of lime and ſtone, London en|cloſed with a wall. Iohn. Hard. in the beſt maner fortified with diuerſe fayre towers: and in the weſt part of the ſame wall he erected a ſtrong gate, which he commaunded to be cleped after his name, Luds gate, and ſo vnto this day it is called Ludgate, [illegible]he, s, only drowned in y^e pronunciatio~ of the word. In the ſame citie alſo he ſoiorned for the more part, Fabian. Gal. Mon. Mat. VVeſt. by reaſon whereof the inhabitants encreaſed and many habitations were buylded to receyue them, & he himſelfe cauſed buildings to be made betwixt London ſtone & Ludgate, & buyl]ded for himſelf not farre from the ſayd gate a faire palace, which is the Biſh. of Londons palace, The Biſhop[illegible] palace. be]ſide Paules, at this day (as ſome think) yet Harl. ſuppoſeth it to haue bin Bainards caſtel, wher the black friers now ſtandeth. He alſo builded a faire Temple nere to his ſaid palace, which temple (as ſome take it) was after turned to a church, and at this day cleped Paules. By reaſon that K. Lud ſo much eſtemed y^e citie before al other of his realme, enlarging it ſo greatly as he did, and co~tinually in manet remained there, the name was cha~ged, The name of Troynouan[illegible] chaunged and called London. ſo y^e it was called Cairlud, y^t is to ſay, Luds towne: & after by corruptio~ of ſpeech it was named Lo~don. Beſide the princely doings of this Lud touching the aduancement of the co~mon wealth by ſtudies aperteyning to the time of peace, hee was alſo ſtrong and valiant in armes, in ſubduing his eni]mies. He was alſo bounteous and liberall both in giftes and in keeping a plentifull houſe, ſo that he was greatly beloued of all the Brytaynes. Fi]nally, when he had thus raigned with great ho]nor for the ſpace of .xj. yeres, he died, and was bu]ried nere Ludgate, leauing after him two ſonnes, Androgeus and Theomancius or Tenancius.

Calsibellane.

source image: 154 Calsi]bellaen. CAſſibellane the brother of Lud was admitted king of Brytaine, in the yeare of the worlde .3908. 3908 after the buyl]ding of Rome, 692. & before the comming of Chriſt .58. complete. Gal. Mon. Mat. VVeſt. Fabian. For ſith the two ſonnes of Lud were not of age able to gouerne, the rule of the land was comitted to Caſſibellane: but yet (as ſome haue written) he was not created king, but rather appoynted ruler and protector of the land, during the nonage of his nephewes.

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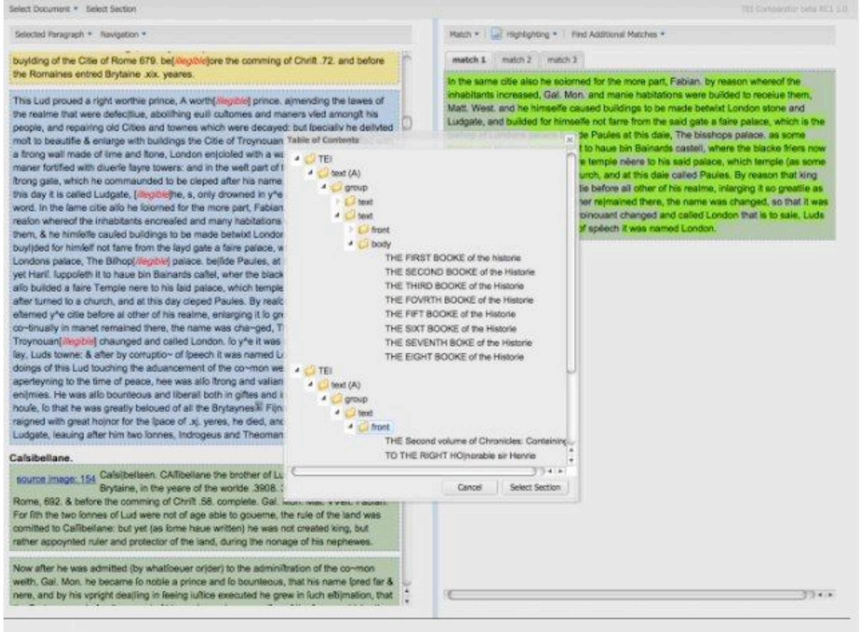
caused buildings to be made betwixt London stone and
selfe not farre from the said gate a faire palace, which is the
side Paules at this daie, The bisshops palace. as some
it to haue bin Bainards castell, where the blacke friers now
aire temple néere to his said palace, which temple (as some
take it) was after turned to a church, and at this daie called Paules. By reason that king Lud so much esteemed that ci]tie before all other of his realme, inlarging it so greatlie as he did, and continuallie in manner re]mained there, the name was changed, so that it was called Caerlud, The name of Troinouant changed and called London that is to saie, Luds towne: and after by corruption of spéech it was named London.

Browsing for Manual Navigation Matching


Select Document ▾ Select Section
TEI Comparator beta RC1 1.0
Selected Paragraph ▾ Navigation ▾
Match ▾ Highlighting ▾ Find Additional Matches ▾
match 1
match 2
match 3
Table of Contents
Cancel
Select Section

TEI
text (A)
group
text
text
front
body
THE FIRST BOOKE of the historie
THE SECOND BOOKE of the Historie
THE THIRD BOOKE of the Historie
THE FOVRTH BOOKE of the Historie
THE FIFT BOOKE of the Historie
THE SIXT BOOKE of the Historie
THE SEVENTH BOKE of the Historie
THE EIGHT BOOKE of the Historie
TEI
text (A)
group
text
front
THE Second volume of Chronicles: Conteining
TO THE RIGHT HO]norable sir Henrie

In the same citie also he soiorned for the more part, Fabian. by reason whereof the inhabitants increased, Gal. Mon. and manie habitations were builded to receiue them, Matt. West. and he himselfe caused buildings to be made betwixt London stone and Ludgate, and builded for himselfe not farre from the said gate a faire palace, which is the
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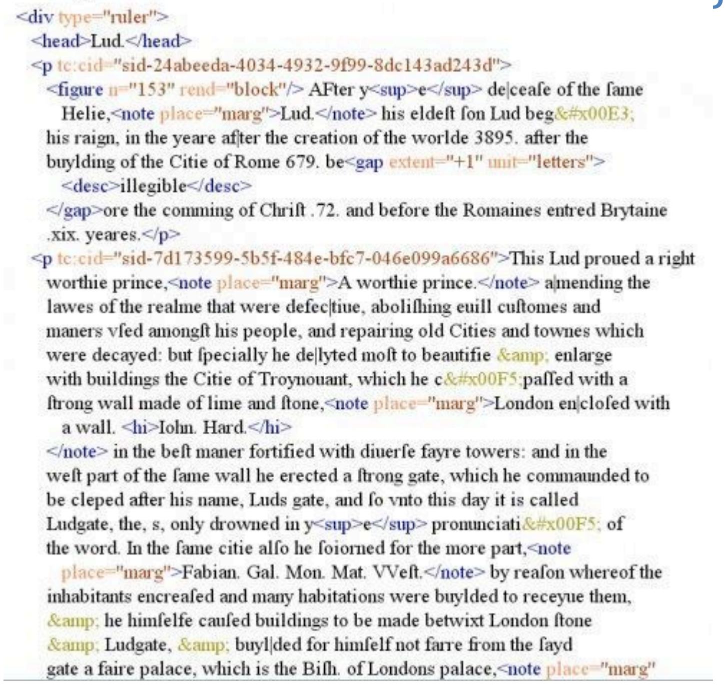
tie before all other of his realme, inlarging it so greatlie as
her re]mained there, the name was changed, so that it was
oinouant changed and called London that is to saie, Luds
of spéech it was named London.

XML of Holinshed's Chronicles with TEI Concordant IDs



```
<div type="ruler">
  <head>Lud.</head>
  <p tc:cid="sid-24abeeda-4034-4932-9f99-8dc143ad243d">
    <figure n="153" rend="block"/> AFter y<sup>e</sup> de|ceaſe of the ſame
      Helie,<note place="marg">Lud.</note> his eldeſt ſon Lud beg&#x00E3;
    his raign, in the yeare af|ter the creation of the worlde 3895. after the
    buylding of the Citie of Rome 679. be<gap extent="+1" unit="letters">
      <desc>illegible</desc>
    </gap>ore the comming of Chriſt .72. and before the Romaines entred Brytaine
    .xix. yeares.</p>
  <p tc:cid="sid-7d173599-5b5f-484e-bfc7-046e099a6686">This Lud proued a right
    worthie prince,<note place="marg">A worthie prince.</note> a|mending the
    lawes of the realme that were defec|tiue, aboliſhing euill cuſtomes and
    maners vſed amongſt his people, and repairing old Cities and townes which
    were decayed: but ſpecially he de|lyted moſt to beautifie &amp; enlarge
    with buildings the Citie of Troynouant, which he c&#x00F5;paſſed with a
    ſtrong wall made of lime and ſtone,<note place="marg">London en|cloſed with
      a wall. <hi>Iohn. Hard.</hi>
    </note> in the beſt maner fortified with diuerſe fayre towers: and in the
    weſt part of the ſame wall he erected a ſtrong gate, which he commaunded to
    be cleped after his name, Luds gate, and ſo vnto this day it is called
    Ludgate, the, s, only drowned in y<sup>e</sup> pronunciati&#x00F5; of
    the word. In the ſame citie alſo he ſoiorned for the more part,<note
      place="marg">Fabian. Gal. Mon. Mat. VVeſt.</note> by reaſon whereof the
    inhabitants encreaſed and many habitations were buylded to receyue them,
    &amp; he himſelfe cauſed buildings to be made betwixt London ſtone
    &amp; Ludgate, &amp; buyl|ded for himſelf not farre from the ſayd
    gate a faire palace, which is the Biſh. of Londons palace,<note place="marg"
```

Text::TEI::Collate

Programming Language: Java.

Open Source: Yes. Available from CPAN and GITHUB:

- http://search.cpan.org/~aurum/Text-TEI-Collate-2.1/lib/Text/TEI/Collate.pm
- https://github.com/tla/ncritic/tree/master/cpan/Text-TEI-Collate

Input: JAVA strings, Plain text files, JSON format

Output: JAVA strings, Plain text files, JSON format, TEI-parallel segmentation format.

Interface: Command line (Java-based programming API). Text interface (STDIN/STDOUT).

Collation Algorithm: A collation algorithm is provided, although it does not handle transpositions (permutations) according to http://cpansearch.perl.org/src/AURUM/Text-TEI-Collate-2.1/TODO. Thus, the collation algorithm is not recommended for use.

Visualizations: Does not provide visualization (see: https://github.com/tla/ncritic/blob/master/cpan/Text-TEI-Collate/doc/guide_to_scripts.txt), output is provided in TEI-parallel segmentation format for visualization in other software, e.g., phylogenetic/dendritic style visualization made available in, e.g., http://mobyle.pasteur.fr/cgi-bin/MobylePortal/portal.py?form=pars

Web Service: Not made available as a web service. However, being Java-based, it would not be difficult to operate it from a conventional web server.

Collation Type: Vertical (line-by-line) collation/differencing.

Number of Files: Multiple (not limited by the software).

Data Manipulation after Processing: Unknown

Documentation: Detailed documentation is present in terms of substantial comments and/or examples within the source code. Expert level of technical proficiency may be required to follow these. Some auto-documentation is produced from the embedded source-code comments, e.g.,

- http://search.cpan.org/~aurum/Text-TEI-Collate-2.1/lib/Text/TEI/Collate.pm

Installation Requirements: Java Standard Development Kit (SDK).

Tool History: developed by Tara Andrews of the Oxford History Department: http://byzstud.history.ox.ac.uk//senior_members/andrews_tara.html. It was used successfully to edit the Armenian-language Chronicle of Matthew of Odessa.

Problems:

- Documentation is limited, although this poses no problem to the intermediate/advanced Java developer, because the exposition of the source code is logical and coherent.
- Collation algorithm is not yet current.

Recommended: Not recommended for use at this time, but is highly recommended for follow up of further developments, as they are made available.

Technical Experience: Intermediate Java development experience (or greater).

Preprocessing Needed: No.

Features:
- TEI-compliant output
- Also, GraphML support (uses hierarchical/graph-based formalism).

Comments:
From http://cpansearch.perl.org/src/AURUM/Text-TEI-Collate-2.1/README,
This is a scholarly text collation program, which has been used successfully for editing the Armenian-language Chronicle of Matthew of Edessa. Its documentation and test suite is half-done, its functionality is mostly there but not complete, and there are some improvements to the algorithm that could be made.

The code was developed by a one-person project and is also a work in progress. Admittedly, the collation algorithm available is not current, nor is substantial documentation available (thus the code is obscure to anyone other than a Java specialist) so we do not generally recommend this project for use at this time. However, there are some noteworthy aspects:

- Modern languages and programming paradigms are used.
- The author is coherent in her exposition (despite the incomplete nature of the project).
- The presentation of the code shows that it has good logical structure, and is highly modular, and entirely self-contained.
- The author shows clearly the need for hierarchical/dendritic/phylogenetic style visualization (i.e., uses a graph-based programming formalism).
- The author shows clear aware of the present deficiencies of the work.

Based on the above, we heartily recommend following up on the algorithmic developments here in the future. This could make a highly useful finished product, when the (stated) deficiencies are addressed, and substantial documentation is provided.

CollateX

Programming Language: Java.

Open Source: Yes. Available from:

- Interedition on GitHub: https://github.com/interedition/collatex
- Main development site: http://collatex.net (last updated 2013).
- Old development site: http://collatex.sourceforge.net/ (last updated March 2011).
- Old development site: https://launchpad.net/collatex (last updated July 2010).

Input: plain text, JSON, XML

Output: JSON, TEI P5, GraphML, GraphViz DOT, SVG vector graphics.

Interface: Command Line Interface. Web interface available (see below).

Collation Algorithms:

1. Dekker. The most mature algorithm offered by CollateX, the Dekker algorithm aligns an arbitrary number of text versions, optimizes local alignment of partial token sequences (phrases), and performs transposition detection.
2. The Needleman-Wunsch. This well-known global alignment algorithm broadly applied in Bioinformatics and Social Sciences searches for an optimal alignment (based on a score function which penalizes gaps) of an arbitrary number of versions.
3. *MEDITE*. CollateX features an experimental implementation of the algorithm of Bourdalliet et. al. Like the Dekker algorithm, this algorithm takes transpositions into account.

Visualization: Graph Data (working with Juxta as model for visualization)

Web Service: Yes. Multiple web service implementations are available online. The developer (less than casual user) can also set up/administer.

- One using YUI framework and JavaScript
- Another using PHP and Java

Type of Collation: Tokenization / differencing with multiple choices for Collation algorithm (as above) All Collation Algorithms used in CollateX are based on a graph data structure, the "variant graph", and use a progressive alignment technique.

Number of Files: Multiple.

Data Manipulation after Processing (ignore white space, etc.): Yes.

Documentation: Detailed.

- http://collatex.net/doc/
- http://collatex.net/apidocs/
- Interedition Wiki: **Getting Started with CollateX Development** http://www.interedition.eu/wiki/index.php/CollateX/GettingStarted

- Interedition Wiki: Main Page http://www.interedition.eu/wiki/index.php/Main_Page
- Interedition Project http://www.interedition.eu/
- CollateX on TextGrid project https://dev2.dariah.eu/wiki/display/TextGrid/CollateX

Installation Requirements: Local installation of Algorithm requires only Java. Requirements of installing your own web service include, depending on the configuration:

- Java, YUI, and Apache Cocoon
- Java and PHP

Multiple implementations of web services are available. To run an existing web service, no installation is required.
http://collatex.net/demo/
http://gregor.middell.net/collatex/api/collate
http://interedition-tools.appspot.com

Tool History: Developed for Interedition project. Can be used as a module within TUSTEP.

Recommended: Yes

Technical Experience: All levels.

Preprocessing Needed: No

Important Features:

- Accompanied by core java library with web services (this can be embedded).
- Simple demo web application is provided.
- Python integration API is provided.
- Graph-based data model.
- Documented for compatibility with Ubuntu Linux, Mac OS X, Windows (XP/Vista/7).

Exceptional Features

- The documentation http://collatex.net/doc/ is exceptionally clear regarding the functionality available, complete with a straightforward description of the data model, and algorithms.
- Have an ongoing relationship with the developers of Juxta. They are working together to have their products conform to TEI standards.
- The Collatex framework supports multiple alignment/collation algorithms.

Other Features

- Substantial GUI not provided

- The second algorithm does not account for the possibility of transposition of text segments. We present the abstract of (which is very important not only historically, but also for the emphasis placed on the relationship between textual and bioinformatics algorithms) as follows:
    - A computer adaptable method for finding similarities in the amino acid sequences of two proteins has been developed. From these findings it is possible to determine whether significant homology exists between the proteins. This information is used to trace their possible evolutionary development.

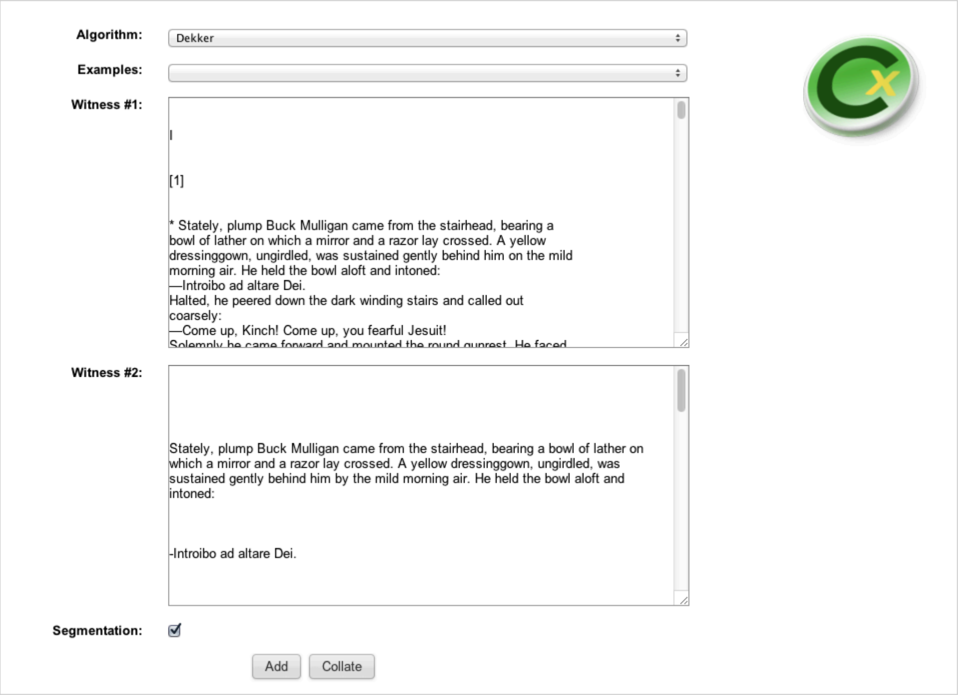
    - The maximum match is a number dependent upon the similarity of the sequences. One of its definitions is the largest number of amino acids of one protein that can be matched with those of a second protein allowing for all possible interruptions in either of the sequences. While the interruptions give rise to a very large number of comparisons, the method efficiently excludes from consideration those comparisons that cannot contribute to the maximum match.

    - Comparisons are made from the smallest unit of significance, a pair of amino acids, one from each protein. All possible pairs are represented by a two-dimensional array, then, all possible comparisons are represented as pathways through this array. For this maximum match only certain of the possible pathways must be evaluated. A numerical value, one in this case, is assigned to every cell in the array representing like amino acids. The maximum match is the largest number that would result from summing the cell values of every pathway."

Screenshots

Screenshots of the Collatex.net demo web service are provided. It was not possible to run the demo service with the full *Ulysses* test files, because doing so crashed the service. It was run with portions of the files only. Furthermore, all of the outputs: the graph visualization, alignment table, GraphViz and GraphML graph markup files, and TEI-P5 XML format results, really require further software to properly visualize (hence, e.g., the JuxtaCommons interface).

Collatex.net/demo text input (Ulysses)



Algorithm: Dekker

Examples:

Witness #1:

```
I

[1]

* Stately, plump Buck Mulligan came from the stairhead, bearing a
bowl of lather on which a mirror and a razor lay crossed. A yellow
dressinggown, ungirdled, was sustained gently behind him on the mild
morning air. He held the bowl aloft and intoned:
—Introibo ad altare Dei.
Halted, he peered down the dark winding stairs and called out
coarsely:
—Come up, Kinch! Come up, you fearful Jesuit!
Solemnly he came forward and mounted the round gunrest. He faced
```

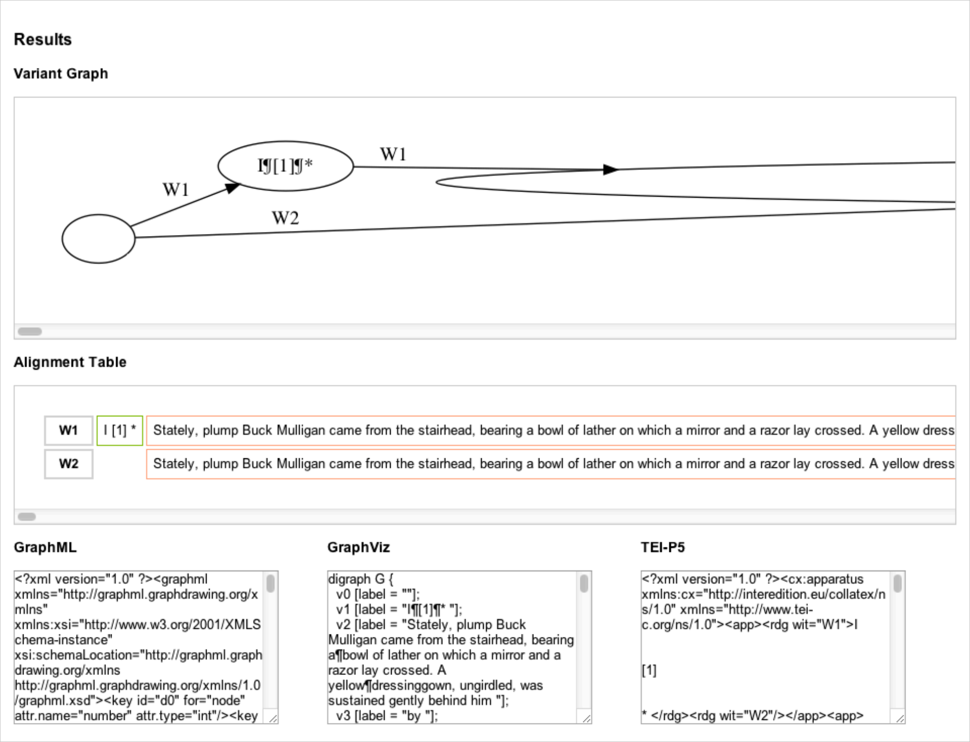
Witness #2:

```
Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on
which a mirror and a razor lay crossed. A yellow dressinggown, ungirdled, was
sustained gently behind him by the mild morning air. He held the bowl aloft and
intoned:

-Introibo ad altare Dei.
```

Segmentation: ☑

Collatex.net/demo output (Ulysses)



Results

Variant Graph

Alignment Table

W1	I [1] *	Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on which a mirror and a razor lay crossed. A yellow dress
W2		Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of lather on which a mirror and a razor lay crossed. A yellow dress

GraphML

```
<?xml version="1.0" ?><graphml
xmlns="http://graphml.graphdrawing.org/x
mlns"
xmlns:xsi="http://www.w3.org/2001/XMLS
chema-instance"
xsi:schemaLocation="http://graphml.graph
drawing.org/xmlns
http://graphml.graphdrawing.org/xmlns/1.0
/graphml.xsd"><key id="d0" for="node"
attr.name="number" attr.type="int"/><key
```

GraphViz

```
digraph G {
  v0 [label = ""];
  v1 [label = "I¶[1]¶* "];
  v2 [label = "Stately, plump Buck
Mulligan came from the stairhead, bearing
a¶bowl of lather on which a mirror and a
razor lay crossed. A
yellow¶dressinggown, ungirdled, was
sustained gently behind him "];
  v3 [label = "by "];
```

TEI-P5

```
<?xml version="1.0" ?><cx:apparatus
xmlns:cx="http://interedition.eu/collatex/n
s/1.0" xmlns="http://www.tei-
c.org/ns/1.0"><app><rdg wit="W1">I


[1]


* </rdg><rdg wit="W2"/></app><app>
```

DV-COLL

Programming Language: Microsoft Visual Basic (VB)

Open Source: No

Input: plain text

Output: plain text

Interface: GUI

Collation Algorithm: Unknown

Visualizations: Output is displayed in text format

Web Service: N/A

Collation Type: vertical (line-by-line) collation.

Number of Files: Many

Data Manipulation after Processing (ignore white space, etc.): N/A

Documentation: Substantial documentation including installation instructions can be found at http://donnevariorum.tamu.edu/resources/down/index.html

Installation Requirements: software is available for Windows. No other requirements.

Tool History: Developed for Donne Variorum by staff at U. Southern Mississippi (the copyright for the software is held by Prof. Gary Stringer at Texas A&M University).

Problems: Runs on Windows systems only.

Recommended: No

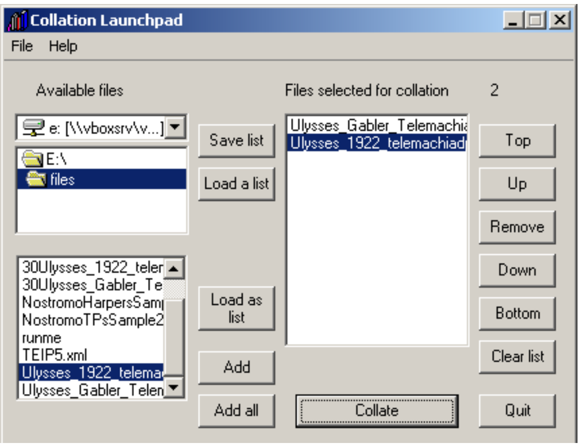
Technical Experience: Little

Preprocessing Needed: No

Features: Minimal but functional collation system: no special features.

Ulysses Sample Data: Screenshots

We tested the DV-Coll on a Windows XP system. The main interface is simple, as follows:



e: [\\vboxsrv\v...]
E:\
files

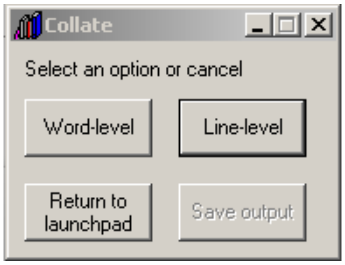
30Ulysses_1922_teler
30Ulysses_Gabler_Te
NostromoHarpersSam
NostromoTPsSample2
runme
TEIP5.xml
Ulysses_1922_telema
Ulysses_Gabler_Telen

Ulysses_Gabler_Telemachi
Ulysses_1922_telemachiad

This allows the user to select a list of versions to compare. Here, we selected:

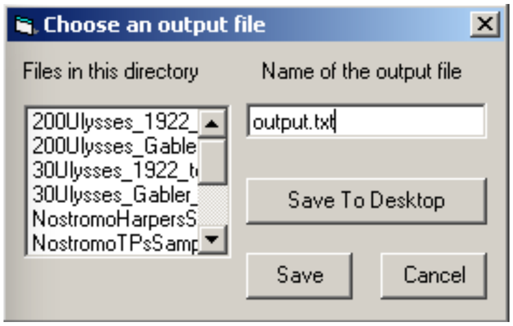
1. Ulysses_1922_telemachiadplus1
2. Ulysses_Gabler_Telemachiad1_MASTER

The MASTER was used as the base for comparison. We pressed “Collate” and were presented with the following options:



As per the instructions, we selected “Word-level” (the DV COLL documentation indicates that “Line-Level” does “not do any actual comparing”).

The collation executed, and we were asked to save an output file:



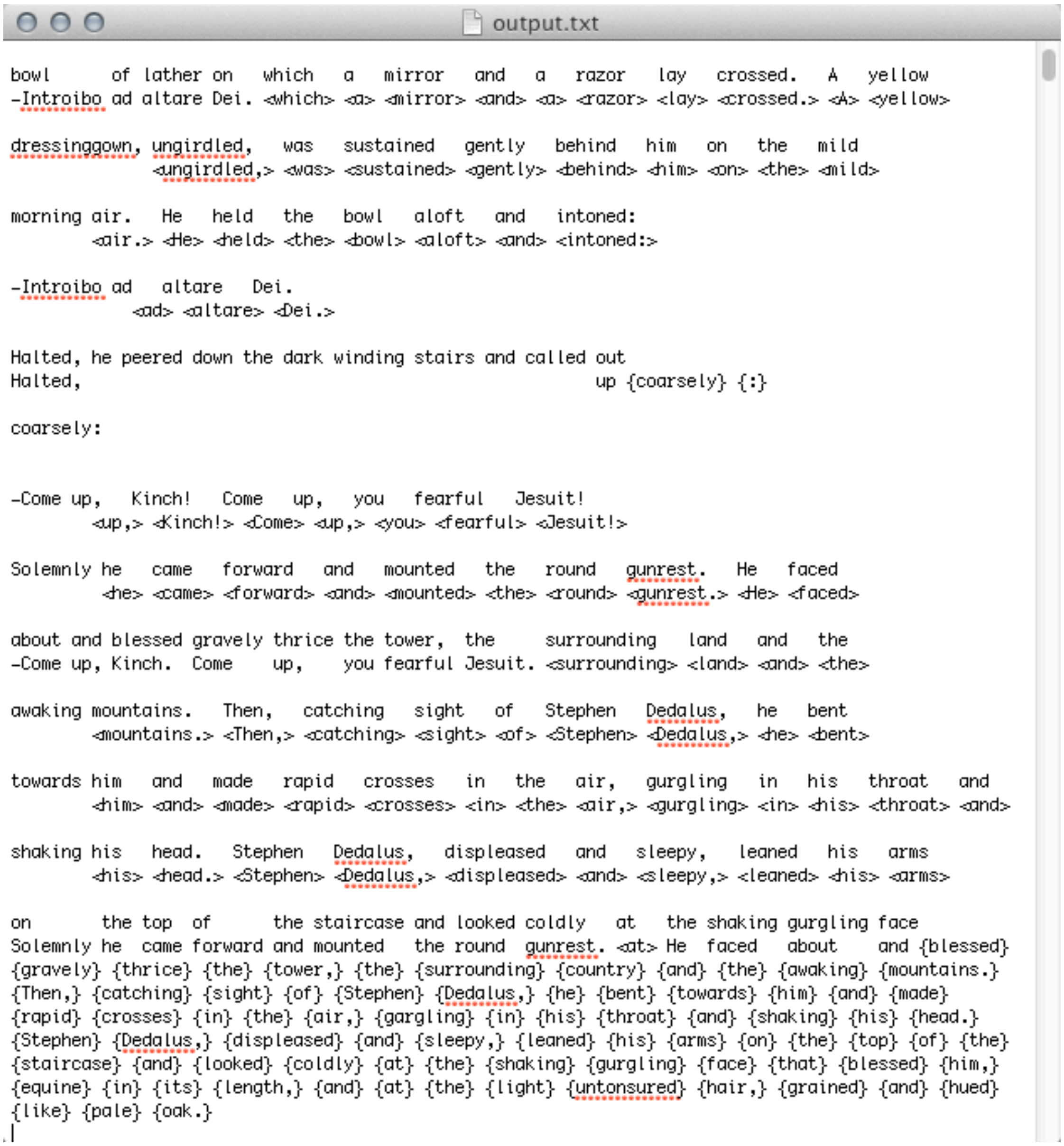
200Ulysses_1922_
200Ulysses_Gable
30Ulysses_1922_t
30Ulysses_Gabler_
NostromoHarpersS
NostromoTPsSamp

output.txt

We include a sample of the text output file here. **To interpret this output, there are four possibilities, reproduced here from the DV COLL documentation:**

1. **Exact Matches** - If the word in the variant line exactly matches the word in the base text, the program suppresses the word in the variant line, leaving a blank space in the output. This reduces clutter in the collation and allows you to focus on variants.
2. **Alterations** - If the word in the variant line differs in any detail from that in the base line, the variant will be situated directly under the base word and printed out in full.
3. **Insertions** - If a word appears in the variant line that has no counterpart in the base line, it will be interpreted as an insertion, enclosed in braces (`{insertion}`), and printed out at the appropriate place in the collation.

Omissions - If a word that appears in the base line does not appear in the variant line, the omitted word is enclosed in angle brackets (`<omission>`) and printed directly under the base word. Ulysses Sample Data: Collation Output (Text Format)



```
bowl      of lather on    which   a   mirror   and   a   razor   lay   crossed.   A   yellow
-Introibo ad altare Dei. <which> <a> <mirror> <and> <a> <razor> <lay> <crossed.> <A> <yellow>

dressinggown, ungirdled,   was   sustained   gently   behind   him   on   the   mild
              <ungirdled,> <was> <sustained> <gently> <behind> <him> <on> <the> <mild>

morning air.   He   held   the   bowl   aloft   and   intoned:
        <air.> <He> <held> <the> <bowl> <aloft> <and> <intoned:>

-Introibo ad   altare   Dei.
            <ad> <altare> <Dei.>

Halted, he peered down the dark winding stairs and called out
Halted,                                                  up {coarsely} {:}

coarsely:


-Come up,   Kinch!   Come   up,   you   fearful   Jesuit!
        <up,> <Kinch!> <Come> <up,> <you> <fearful> <Jesuit!>

Solemnly he   came   forward   and   mounted   the   round   gunrest.   He   faced
         <he> <came> <forward> <and> <mounted> <the> <round> <gunrest.> <He> <faced>

about and blessed gravely thrice the tower,  the    surrounding   land   and   the
-Come up, Kinch.  Come    up,    you fearful Jesuit. <surrounding> <land> <and> <the>

awaking mountains.   Then,   catching   sight   of   Stephen   Dedalus,   he   bent
        <mountains.> <Then,> <catching> <sight> <of> <Stephen> <Dedalus,> <he> <bent>

towards him   and   made   rapid   crosses   in   the   air,   gurgling   in   his   throat   and
        <him> <and> <made> <rapid> <crosses> <in> <the> <air,> <gurgling> <in> <his> <throat> <and>

shaking his   head.   Stephen   Dedalus,   displeased   and   sleepy,   leaned   his   arms
        <his> <head.> <Stephen> <Dedalus,> <displeased> <and> <sleepy,> <leaned> <his> <arms>

on       the top   of      the staircase and looked coldly   at   the shaking gurgling face
Solemnly he came forward and mounted   the round  gunrest. <at> He  faced   about    and {blessed}
{gravely} {thrice} {the} {tower,} {the} {surrounding} {country} {and} {the} {awaking} {mountains.}
{Then,} {catching} {sight} {of} {Stephen} {Dedalus,} {he} {bent} {towards} {him} {and} {made}
{rapid} {crosses} {in} {the} {air,} {gargling} {in} {his} {throat} {and} {shaking} {his} {head.}
{Stephen} {Dedalus,} {displeased} {and} {sleepy,} {leaned} {his} {arms} {on} {the} {top} {of} {the}
{staircase} {and} {looked} {coldly} {at} {the} {shaking} {gurgling} {face} {that} {blessed} {him,}
{equine} {in} {its} {length,} {and} {at} {the} {light} {untonsured} {hair,} {grained} {and} {hued}
{like} {pale} {oak.}
```

SimpleTCT

Programming Language: Java

Open Source: Yes. Available from http://opendaht.org/SimpleTCT.html

Input: RTF, plain text

Output: RTF, plain text

Interface: GUI.

Collation Algorithm: N/A

Visualizations: N/A

Web Service: N/A

Collation Type: N/A

Number of Files: Multiple

Data Manipulation after Processing (ignore white space, etc.): N/A

Documentation (not detailed or detailed):

- Demonstration on Youtube http://youtu.be/r0KMuQj0o0g
- Description on main site http://opendaht.org/SimpleTCT.html

Installation Requirements:
Requires Java Run-time Environment (JRE)

Tool History: Developed by James O'Sullivan and Mary Galvin of University College Cork in June 2012.

Problems: User can select text, apply different tags, annotate these categories, and output the text collection in a linear format, organized according to these "themes" (categories). This may be helpful for manual text comparison, but it is not recommended here (for use, or testing) because the functionality it extremely limited and no processing functionality is provided. Effectively, this represents a manual text-collation environment. Nevertheless, it serves to illustrate clearly some basic (manual/user-intervention) features for textual comparison/analysis, for which it deserves some attention. SimpleTCT also deserves attention for radiating the kind of simplicity of interface that all philological tools should have (JuxtaCommons shows this kind of simplicity as well). We need philological tools that incorporate sophisticated algorithms, while keeping the simple feel of this.

Recommended: No.

Technical Experience: N/A

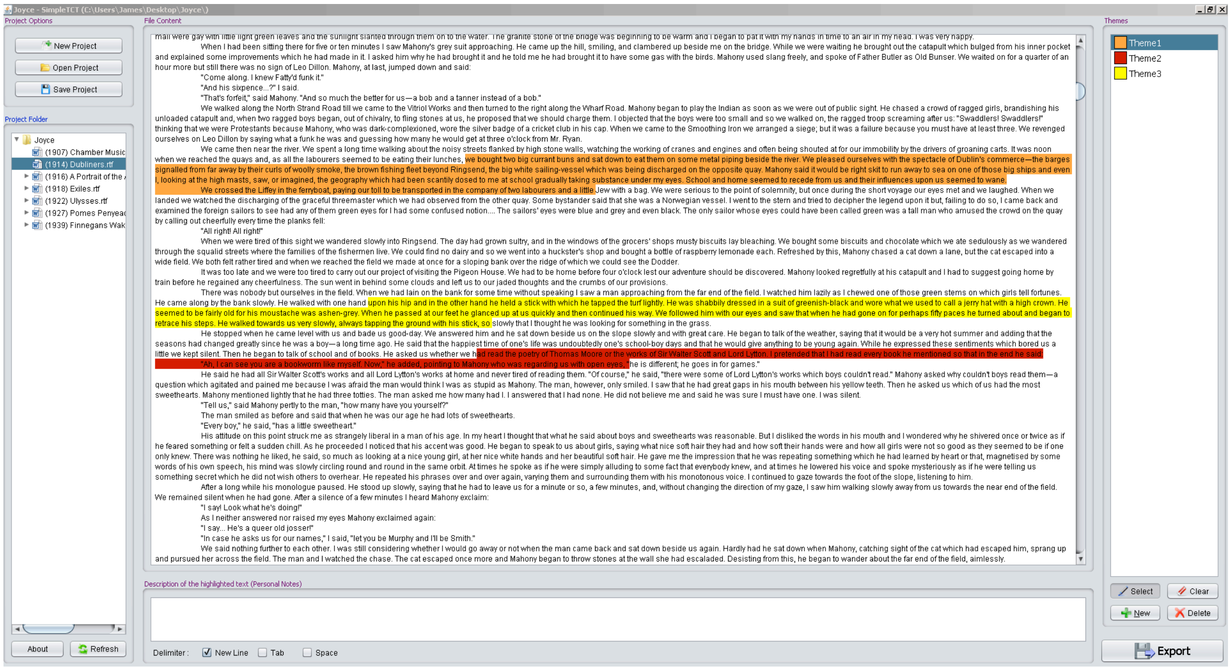
Preprocessing Needed: N/A. No automatic processing (only user markup).

Features: Compatible with Mac, Unix/Linux, and Windows.

- User intervention/annotation
- Useful for textual annotation, manual visual comparison, and thematic organization.
- Note: not a collation tool.

Screenshot

Here a sample screenshot is shown (taken from the main site) illustrating the application of colored text categories associated with labels ("themes").



mall were gay with little light green leaves and the sunlight slanted through them on to the water. The granite stone of the bridge was beginning to be warm and I began to pat it with my hands in time to an air in my head. I was very happy.

When I had been sitting there for five or ten minutes I saw Mahony's grey suit approaching. He came up the hill, smiling, and clambered up beside me on the bridge. While we were waiting he brought out the catapult which bulged from his inner pocket and explained some improvements which he had made in it. I asked him why he had brought it and he told me he had brought it to have some gas with the birds. Mahony used slang freely, and spoke of Father Butler as Old Bunser. We waited on for a quarter of an hour more but still there was no sign of Leo Dillon. Mahony, at last, jumped down and said:

"Come along. I knew Fatty'd funk it."

"And his sixpence...?" I said.

"That's forfeit," said Mahony. "And so much the better for us—a bob and a tanner instead of a bob."

We walked along the North Strand Road till we came to the Vitriol Works and then turned to the right along the Wharf Road. Mahony began to play the Indian as soon as we were out of public sight. He chased a crowd of ragged girls, brandishing his unloaded catapult and, when two ragged boys began, out of chivalry, to fling stones at us, he proposed that we should charge them. I objected that the boys were too small and so we walked on, the ragged troop screaming after us: "Swaddlers! Swaddlers!" thinking that we were Protestants because Mahony, who was dark-complexioned, wore the silver badge of a cricket club in his cap. When we came to the Smoothing Iron we arranged a siege; but it was a failure because you must have at least three. We revenged ourselves on Leo Dillon by saying what a funk he was and guessing how many he would get at three o'clock from Mr. Ryan.

We came then near the river. We spent a long time walking about the noisy streets flanked by high stone walls, watching the working of cranes and engines and often being shouted at for our immobility by the drivers of groaning carts. It was noon when we reached the quays and, as all the labourers seemed to be eating their lunches, we bought two big currant buns and sat down to eat them on some metal piping beside the river. We pleased ourselves with the spectacle of Dublin's commerce—the barges signalled from far away by their curls of woolly smoke, the brown fishing fleet beyond Ringsend, the big white sailing-vessel which was being discharged on the opposite quay. Mahony said it would be right skit to run away to sea on one of those big ships and even I, looking at the high masts, saw, or imagined, the geography which had been scantily dosed to me at school gradually taking substance under my eyes. School and home seemed to recede from us and their influences upon us seemed to wane.

We crossed the Liffey in the ferryboat, paying our toll to be transported in the company of two labourers and a little Jew with a bag. We were serious to the point of solemnity, but once during the short voyage our eyes met and we laughed. When we landed we watched the discharging of the graceful threemaster which we had observed from the other quay. Some bystander said that she was a Norwegian vessel. I went to the stern and tried to decipher the legend upon it but, failing to do so, I came back and examined the foreign sailors to see had any of them green eyes for I had some confused notion.... The sailors' eyes were blue and grey and even black. The only sailor whose eyes could have been called green was a tall man who amused the crowd on the quay by calling out cheerfully every time the planks fell:

"All right! All right!"

When we were tired of this sight we wandered slowly into Ringsend. The day had grown sultry, and in the windows of the grocers' shops musty biscuits lay bleaching. We bought some biscuits and chocolate which we ate sedulously as we wandered through the squalid streets where the families of the fishermen live. We could find no dairy and so we went into a huckster's shop and bought a bottle of raspberry lemonade each. Refreshed by this, Mahony chased a cat down a lane, but the cat escaped into a wide field. We both felt rather tired and when we reached the field we made at once for a sloping bank over the ridge of which we could see the Dodder.

It was too late and we were too tired to carry out our project of visiting the Pigeon House. We had to be home before four o'clock lest our adventure should be discovered. Mahony looked regretfully at his catapult and I had to suggest going home by train before he regained any cheerfulness. The sun went in behind some clouds and left us to our jaded thoughts and the crumbs of our provisions.

There was nobody but ourselves in the field. When we had lain on the bank for some time without speaking I saw a man approaching from the far end of the field. I watched him lazily as I chewed one of those green stems on which girls tell fortunes. He came along by the bank slowly. He walked with one hand upon his hip and in the other hand he held a stick with which he tapped the turf lightly. He was shabbily dressed in a suit of greenish-black and wore what we used to call a jerry hat with a high crown. He seemed to be fairly old for his moustache was ashen-grey. When he passed at our feet he glanced up at us quickly and then continued his way. We followed him with our eyes and saw that when he had gone on for perhaps fifty paces he turned about and began to retrace his steps. He walked towards us very slowly, always tapping the ground with his stick, so slowly that I thought he was looking for something in the grass.

He stopped when he came level with us and bade us good-day. We answered him and he sat down beside us on the slope slowly and with great care. He began to talk of the weather, saying that it would be a very hot summer and adding that the seasons had changed greatly since he was a boy—a long time ago. He said that the happiest time of one's life was undoubtedly one's school-boy days and that he would give anything to be young again. While he expressed these sentiments which bored us a little we kept silent. Then he began to talk of school and of books. He asked us whether we had read the poetry of Thomas Moore or the works of Sir Walter Scott and Lord Lytton. I pretended that I had read every book he mentioned so that in the end he said:

"Ah, I can see you are a bookworm like myself. Now," he added, pointing to Mahony who was regarding us with open eyes, "he is different; he goes in for games."

He said he had all Sir Walter Scott's works and all Lord Lytton's works at home and never tired of reading them. "Of course," he said, "there were some of Lord Lytton's works which boys couldn't read." Mahony asked why couldn't boys read them—a question which agitated and pained me because I was afraid the man would think I was as stupid as Mahony. The man, however, only smiled. I saw that he had great gaps in his mouth between his yellow teeth. Then he asked us which of us had the most sweethearts. Mahony mentioned lightly that he had three totties. The man asked me how many had I. I answered that I had none. He did not believe me and said he was sure I must have one. I was silent.

"Tell us," said Mahony pertly to the man, "how many have you yourself?"

The man smiled as before and said that when he was our age he had lots of sweethearts.

"Every boy," he said, "has a little sweetheart."

His attitude on this point struck me as strangely liberal in a man of his age. In my heart I thought that what he said about boys and sweethearts was reasonable. But I disliked the words in his mouth and I wondered why he shivered once or twice as if he feared something or felt a sudden chill. As he proceeded I noticed that his accent was good. He began to speak to us about girls, saying what nice soft hair they had and how soft their hands were and how all girls were not so good as they seemed to be if one only knew. There was nothing he liked, he said, so much as looking at a nice young girl, at her nice white hands and her beautiful soft hair. He gave me the impression that he was repeating something which he had learned by heart or that, magnetised by some words of his own speech, his mind was slowly circling round and round in the same orbit. At times he spoke as if he were simply alluding to some fact that everybody knew, and at times he lowered his voice and spoke mysteriously as if he were telling us something secret which he did not wish others to overhear. He repeated his phrases over and over again, varying them and surrounding them with his monotonous voice. I continued to gaze towards the foot of the slope, listening to him.

After a long while his monologue paused. He stood up slowly, saying that he had to leave us for a minute or so, a few minutes, and, without changing the direction of my gaze, I saw him walking slowly away from us towards the near end of the field. We remained silent when he had gone. After a silence of a few minutes I heard Mahony exclaim:

"I say! Look what he's doing!"

As I neither answered nor raised my eyes Mahony exclaimed again:

"I say... He's a queer old josser!"

"In case he asks us for our names," I said, "let you be Murphy and I'll be Smith."

We said nothing further to each other. I was still considering whether I would go away or not when the man came back and sat down beside us again. Hardly had he sat down when Mahony, catching sight of the cat which had escaped him, sprang up and pursued her across the field. The man and I watched the chase. The cat escaped once more and Mahony began to throw stones at the wall she had escaladed. Desisting from this, he began to wander about the far end of the field, aimlessly.

HRIT Tools (nMerge)

Programming Language: C, Java

Open Source: Yes. Available from multiple sites, including:

- https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/source-code
- http://code.google.com/p/hrit/source/checkout

Input: plain text, XML

Output: plain text, XML

Interface: GUI implementations available in Java and PHP. See https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/galleries for screenshots.

Collation Algorithm: NMERGE (command line tool) based on the valuable references [19-21]. These are noteworthy for the simplicity, clarity, and detail of information contained, whereby the workings of the algorithms are illuminated with clean exposition. These works also communicate much insightful information (from the perspective of the insider) about other prominent collation algorithm implementations. NMERGE is available from:

- http://code.google.com/p/multiversiondocs/

Visualizations: N/A. Unable to process texts

Web Service: web service implementations are available (including demonstrations):

- https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/galleries/cortex-restlet
- https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/galleries/hrit-php-demos
- http://hrit.etl.luc.edu:8080/cortexrestletform/

Collation Type: horizontal and vertical.

Number of Files: Multiple.

Data Manipulation after Processing (ignore white space, etc.): the options available will depend on the front-end implementation.

Documentation: Vast documentation is available. Some of the primary sources are listed here:

- Main Academic site: http://hrit.etl.luc.edu/
- Google Code Project Page http://code.google.com/p/hrit/
- Development site: https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/home
- Documentation: https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/documentation

- Developer handbook/manual https://sites.google.com/a/ctsdh.luc.edu/hrit-intranet/documentation/handbook
- Project Center (at Loyola University Chicago): http://www.luc.edu/ctsdh/

Installation Requirements: Exceptionally simple command line arguments are available for installation. Textbook example of what an easy-to-use command line installation procedure should look like.   First, they install the git version control system:

```
brew install git
```

Then download the latest hritserver code:

```
git clone https://github.com/HRIT-Infrastructure/hritserver.git
```

That creates a folder "hritserver" in that directory. Then you should run the installer:

```
cd hritserversudo ./install-macosx.sh
```

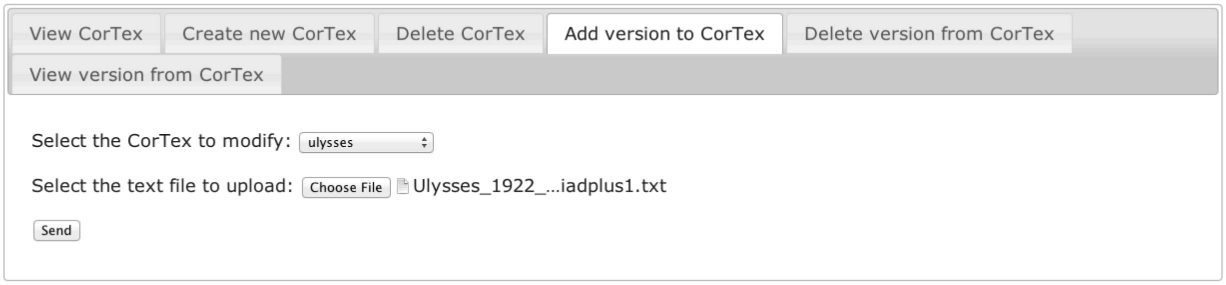
can easily update to the latest version by typing

```
git pull
```

in the hritserver directory.

Tool History: Funded by NEH Level II Digital Humanities Start-Up grants competition. Created at Loyola University Chicago's Center for Textual Studies and Digital Humanities in collaboration with Emerging Technologies Laboratory at the Computer Science Department.

Problems: preliminary testing of the web-service based front-end at http://hrit.etl.luc.edu:8080/cortexrestletform/ did not succeed. We added one file successfully to the "Cortex". Upon attempting to add a second file (below): we were greeted with an "out of Java heap space" error.



Select the CorTex to modify: ulysses

Select the text file to upload: Choose File Ulysses_1922_...iadplus1.txt

This indicates that there are (somewhat artificial) memory limitations, with respect to the front-end implementation demonstrated there, but this is no reason to become discouraged with this collation implementation.

Recommended: N/A

Technical Experience: For the (demo) web service provided above, no technical experience is required. To use the NMERGE tool, software development experience is required.

Preprocessing Needed: No.

Features:

- Web services are available providing GUI's, although it is not clear how substantially comprehensive the GUI's currently available are.
- Online open source environment with collaborative editing/sharing features.
- Markup, annotation, tagging, linking, cross-referencing functionality for coordination of images, texts, and scholarly annotations.
- Compatible with TEI XML format for textual representation.
- Representation and analysis for image formats (incl., Optical Character Recognition (OCR) based functions).
- Features for creating correspondences between textual and image representations of texts.
- Collation is based on the CORTEX data structure, a graph-based data structure that corresponds to the "variant graph" as described in literature from the collateX.net (interedition.eu) community. The CORTEX data structure (and associated algorithms) is based on the Multi-Version Documents (MVD) concept, which is formulated and given detailed elaboration in [19-21], and implemented in the NMERGE tool.
- Any special tags/markup accompanying the text are automatically carried through the collation process, so the user has no need to re-enter them later.

Versioning Machine

Programming Language: JavaScript, XML, HTML, XSLT (for translation between XML and HTML)

Open Source: Yes

Input: XML, HTML

Output: XML, HTML

Interface: GUI

Collation Algorithm: N/A. Versioning Machine is a visualization tool (as below).

Visualizations: GUI is essentially a "web page" to view, in a side-by-side display, multiple textual versions, as encoded in TEI-P5 parallel segmentation format.

Web Service: Is a self-contained web folder.

Collation Type: N/A

Number of Files: Multiple

Data Manipulation after Processing (ignore white space, etc.): N/A (user does all the manipulation/processing).

Documentation (not detailed or detailed): Documentation is detailed and is representative of a good tutorial for TEI XML markup.

Installation Requirements: web browser. Since Versioning Machine is a viewer for (user-generated or user-edited) XML data, it is probably assumed (but not required) that the user has an XML editor (such as oXygen) available.

Tool History: Conceived and developed since year 2000 by Susan Schreibman, previously at University of Maryland Libraries (2005-2008) and Maryland Institute for Technology in the Humanities (2001-2004). The Versioning Machine was developed through collaboration with various personnel at institutions including the Digital Humanities Observatory (DHO), the Maryland Institute for Technology in the Humanities (MITH), and the Office of Digital Collections and Research (DCR) at University of Maryland Libraries.

Problems: None.

Recommended: As a visualization tool for TEI-encoded texts.

Technical Experience: Intermediate XML experience is required. No experience is required to run the demo.

Preprocessing Needed: User does all the markup and collation (or uses other utilities to do more automated processing). Program is a viewer for XML files corresponding to TEI-P5 (parallel segmentation).

Features: Compatibility is engineered and tested with many different web browsers.

GIT

Programming Language: C

Open Source: yes. Available from http://git-scm.com

Input: plain text

Output: plain text

Interface: GUI and/or command line. Can use merge/diff tool via GUI for parallel segmentation.

Collation Algorithm: associated diff tool (Meld and others).

Visualizations: horizontal (parallel segmentation) or vertical (line-by-line).

Web Service: The versioning system is offered as a web-based service (the source code provides client/server functionality) but the differencing/comparison is local.

Collation Type: horizontal (parallel segmentation).

Number of Files: 2-3

Data Manipulation after Processing (ignore white space, etc.): N/A.

Documentation (not detailed or detailed): Highly detailed documentation is available.

Installation Requirements: No special requirements. Exceptionally simple command line installation on Mac (with Homebrew installed): using the following command at the Terminal:

```
brew install git
```

Tool History: developed since 2005; conceived by Linus Torvalds (creator of Linux operating system). Please see http://en.wikipedia.org/wiki/Git_(software) for more details, if desired.

Problems: Please see section On Use of SCM for DH (below).

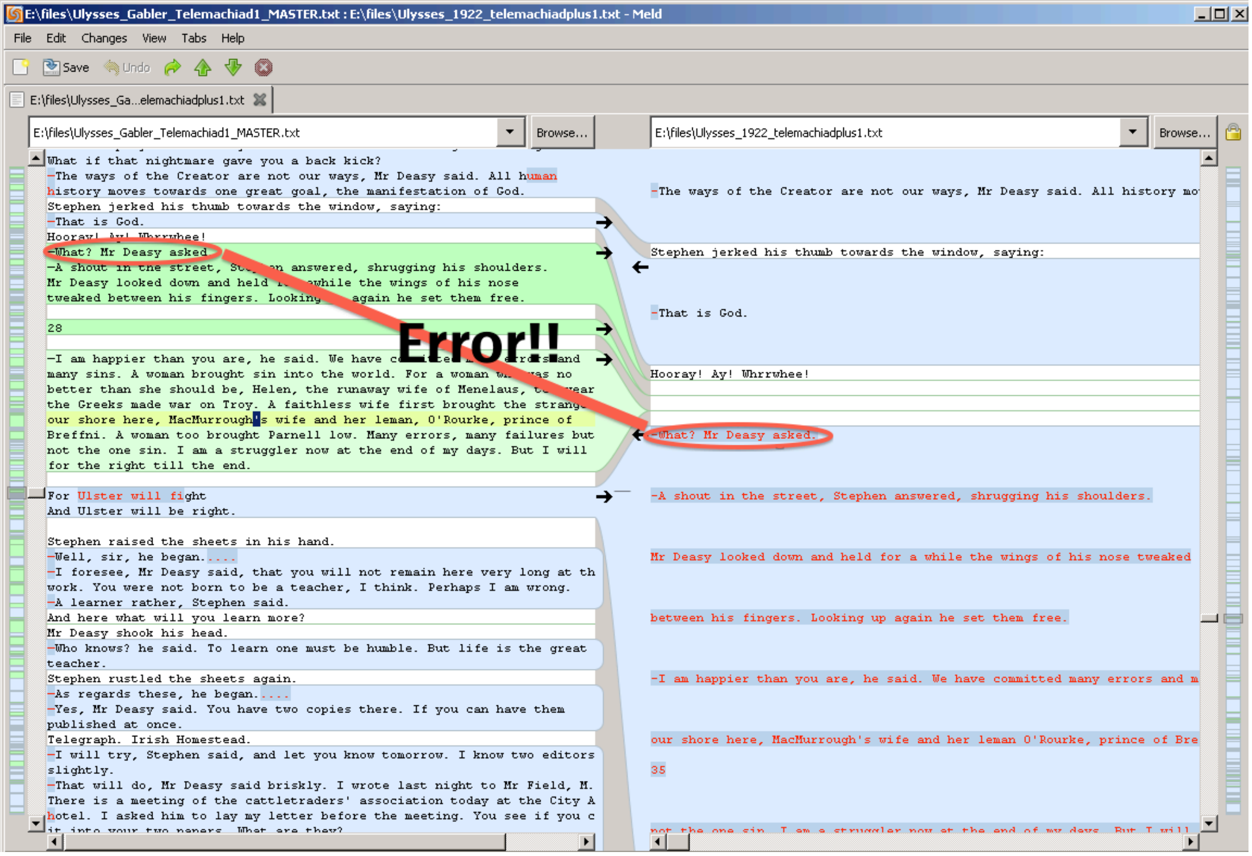
Recommended: No.

Technical Experience: required.

Preprocessing Needed: No

Features: color-coding of differences.

Screenshot of Ulysses text comparison. Note: collation errors!


E:\files\Ulysses_Gabler_Telemachiad1_MASTER.txt : E:\files\Ulysses_1922_telemachiadplus1.txt - Meld
File
Edit
Changes
View
Tabs
Help
Save
Undo
E:\files\Ulysses_Ga...elemachiadplus1.txt
E:\files\Ulysses_Gabler_Telemachiad1_MASTER.txt
Browse...
E:\files\Ulysses_1922_telemachiadplus1.txt
Browse...
Error!!

```
What if that nightmare gave you a back kick?
—The ways of the Creator are not our ways, Mr Deasy said. All human
history moves towards one great goal, the manifestation of God.
Stephen jerked his thumb towards the window, saying:
—That is God.
Hooray! Ay! Whrrwhee!
—What? Mr Deasy asked
—A shout in the street, St[illegible]en answered, shrugging his shoulders.
Mr Deasy looked down and held [illegible] while the wings of his nose
tweaked between his fingers. Looking [illegible] again he set them free.

28

—I am happier than you are, he said. We have [illegible] errors and
many sins. A woman brought sin into the world. For a woman [illegible] no
better than she should be, Helen, the runaway wife of Menelaus, [illegible] year
the Greeks made war on Troy. A faithless wife first brought the strange
our shore here, MacMurrough's wife and her leman, O'Rourke, prince of
Breffni. A woman too brought Parnell low. Many errors, many failures but
not the one sin. I am a struggler now at the end of my days. But I will
for the right till the end.

For Ulster will fight
And Ulster will be right.

Stephen raised the sheets in his hand.
—Well, sir, he began....
—I foresee, Mr Deasy said, that you will not remain here very long at th
work. You were not born to be a teacher, I think. Perhaps I am wrong.
—A learner rather, Stephen said.
And here what will you learn more?
Mr Deasy shook his head.
—Who knows? he said. To learn one must be humble. But life is the great
teacher.
Stephen rustled the sheets again.
—As regards these, he began....
—Yes, Mr Deasy said. You have two copies there. If you can have them
published at once.
Telegraph. Irish Homestead.
—I will try, Stephen said, and let you know tomorrow. I know two editors
slightly.
—That will do, Mr Deasy said briskly. I wrote last night to Mr Field, M.
There is a meeting of the cattletraders' association today at the City A
hotel. I asked him to lay my letter before the meeting. You see if you c
it into your two papers. What are they?
```

```
-The ways of the Creator are not our ways, Mr Deasy said. All history mo

Stephen jerked his thumb towards the window, saying:

-That is God.

Hooray! Ay! Whrrwhee!



-What? Mr Deasy asked.

-A shout in the street, Stephen answered, shrugging his shoulders.

Mr Deasy looked down and held for a while the wings of his nose tweaked

between his fingers. Looking up again he set them free.

-I am happier than you are, he said. We have committed many errors and m

our shore here, MacMurrough's wife and her leman O'Rourke, prince of Bre
35

not the one sin. I am a struggler now at the end of my days. But I will
```

SVN (subversion)

Programming Language: C

Open Source: Yes. Available from http://subversion.apache.org/download/

Input: plain text

Output: plain text

Interface: GUI, Command line

Collation Algorithm: opendiff (and other similar utilities)

Visualizations: Parallel segmentation (two-columns) or traditional "diff" (line-by-line comparison)

Web Service: Implements client and server functionality, to manage versions in a networked setting.

Collation Type: horizontal (parallel segmentation).

Number of Files: 2-3

Data Manipulation after Processing (ignore white space, etc.): can compress white space / ignore case.

Documentation (not detailed or detailed): Highly detailed documentation is available at http://subversion.apache.org/docs/

Installation Requirements: binary packages are available. To compile the package from the source code, there are other requirements (e.g., the gnu 'gcc' compiler suite).

Tool History: Subversion has a rich history dating to its creation in 2000 by CollabNet Inc., and is now a flagship product of the Apache Software Foundation with contributions from a large global developer community.

Problems: Please see section On Use of SCM for DH (below).

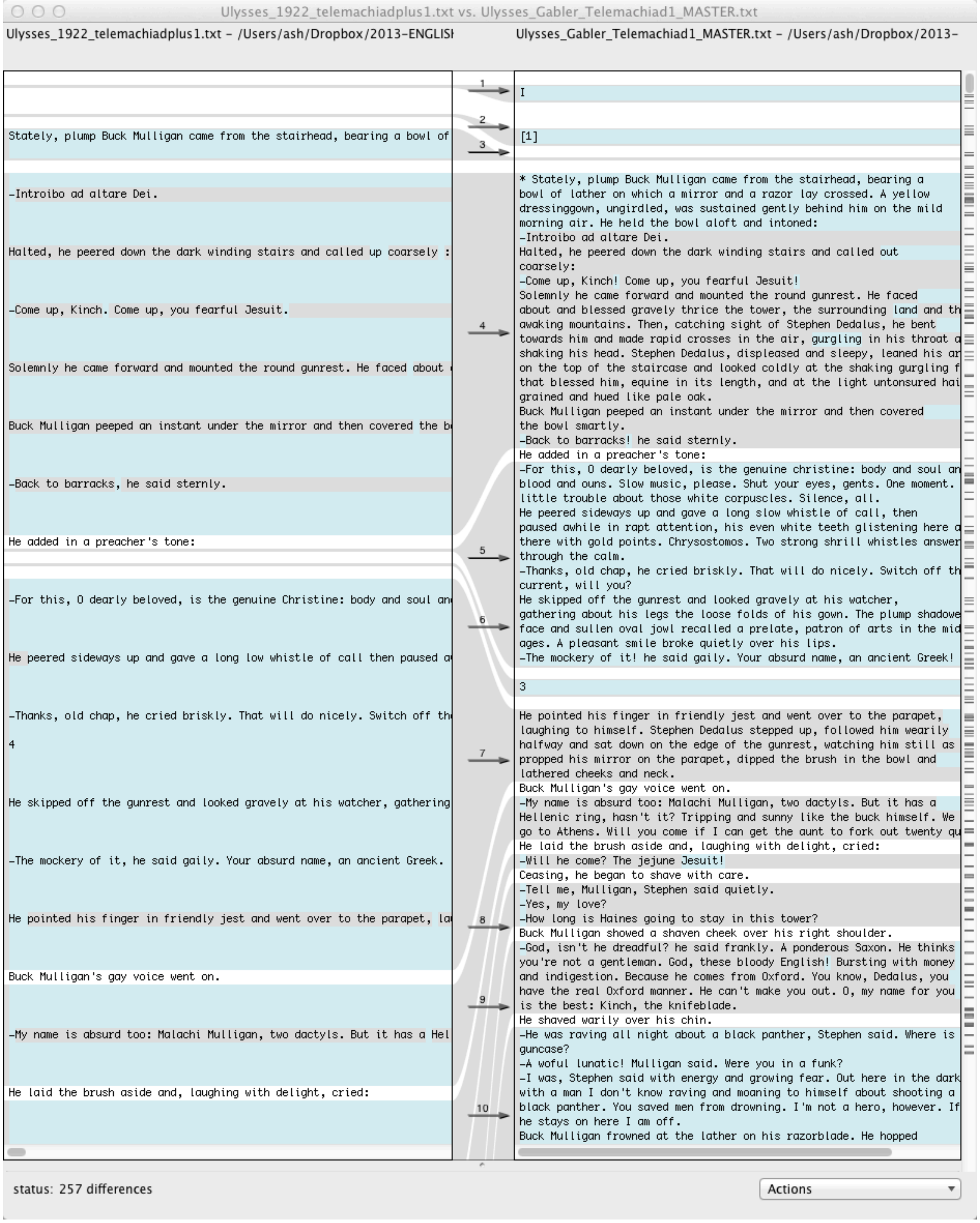
Recommended: No.

Technical Experience: required.

Preprocessing Needed: No.

Features: collation using associated merge/diff tools.

Screenshot (Ulysses Text)



Ulysses_1922_telemachiadplus1.txt vs. Ulysses_Gabler_Telemachiad1_MASTER.txt

Ulysses_1922_telemachiadplus1.txt - /Users/ash/Dropbox/2013-ENGLISH

Stately, plump Buck Mulligan came from the stairhead, bearing a bowl of

-Introibo ad altare Dei.

Halted, he peered down the dark winding stairs and called up coarsely :

-Come up, Kinch. Come up, you fearful Jesuit.

Solemnly he came forward and mounted the round gunrest. He faced about

Buck Mulligan peeped an instant under the mirror and then covered the b

-Back to barracks, he said sternly.

He added in a preacher's tone:

-For this, O dearly beloved, is the genuine Christine: body and soul an

He peered sideways up and gave a long low whistle of call then paused a

-Thanks, old chap, he cried briskly. That will do nicely. Switch off th

4

He skipped off the gunrest and looked gravely at his watcher, gathering

-The mockery of it, he said gaily. Your absurd name, an ancient Greek.

He pointed his finger in friendly jest and went over to the parapet, la

Buck Mulligan's gay voice went on.

-My name is absurd too: Malachi Mulligan, two dactyls. But it has a Hel

He laid the brush aside and, laughing with delight, cried:

Ulysses_Gabler_Telemachiad1_MASTER.txt - /Users/ash/Dropbox/2013-

I

[1]

* Stately, plump Buck Mulligan came from the stairhead, bearing a
bowl of lather on which a mirror and a razor lay crossed. A yellow
dressinggown, ungirdled, was sustained gently behind him on the mild
morning air. He held the bowl aloft and intoned:
-Introibo ad altare Dei.
Halted, he peered down the dark winding stairs and called out
coarsely:
-Come up, Kinch! Come up, you fearful Jesuit!
Solemnly he came forward and mounted the round gunrest. He faced
about and blessed gravely thrice the tower, the surrounding land and th
awaking mountains. Then, catching sight of Stephen Dedalus, he bent
towards him and made rapid crosses in the air, gurgling in his throat a
shaking his head. Stephen Dedalus, displeased and sleepy, leaned his ar
on the top of the staircase and looked coldly at the shaking gurgling f
that blessed him, equine in its length, and at the light untonsured hai
grained and hued like pale oak.
Buck Mulligan peeped an instant under the mirror and then covered
the bowl smartly.
-Back to barracks! he said sternly.
He added in a preacher's tone:
-For this, O dearly beloved, is the genuine christine: body and soul an
blood and ouns. Slow music, please. Shut your eyes, gents. One moment.
little trouble about those white corpuscles. Silence, all.
He peered sideways up and gave a long slow whistle of call, then
paused awhile in rapt attention, his even white teeth glistening here a
there with gold points. Chrysostomos. Two strong shrill whistles answer
through the calm.
-Thanks, old chap, he cried briskly. That will do nicely. Switch off th
current, will you?
He skipped off the gunrest and looked gravely at his watcher,
gathering about his legs the loose folds of his gown. The plump shadowe
face and sullen oval jowl recalled a prelate, patron of arts in the mid
ages. A pleasant smile broke quietly over his lips.
-The mockery of it! he said gaily. Your absurd name, an ancient Greek!

3

He pointed his finger in friendly jest and went over to the parapet,
laughing to himself. Stephen Dedalus stepped up, followed him wearily
halfway and sat down on the edge of the gunrest, watching him still as
propped his mirror on the parapet, dipped the brush in the bowl and
lathered cheeks and neck.
Buck Mulligan's gay voice went on.
-My name is absurd too: Malachi Mulligan, two dactyls. But it has a
Hellenic ring, hasn't it? Tripping and sunny like the buck himself. We
go to Athens. Will you come if I can get the aunt to fork out twenty qu
He laid the brush aside and, laughing with delight, cried:
-Will he come? The jejune Jesuit!
Ceasing, he began to shave with care.
-Tell me, Mulligan, Stephen said quietly.
-Yes, my love?
-How long is Haines going to stay in this tower?
Buck Mulligan showed a shaven cheek over his right shoulder.
-God, isn't he dreadful? he said frankly. A ponderous Saxon. He thinks
you're not a gentleman. God, these bloody English! Bursting with money
and indigestion. Because he comes from Oxford. You know, Dedalus, you
have the real Oxford manner. He can't make you out. O, my name for you
is the best: Kinch, the knifeblade.
He shaved warily over his chin.
-He was raving all night about a black panther, Stephen said. Where is
guncase?
-A woful lunatic! Mulligan said. Were you in a funk?
-I was, Stephen said with energy and growing fear. Out here in the dark
with a man I don't know raving and moaning to himself about shooting a
black panther. You saved men from drowning. I'm not a hero, however. If
he stays on here I am off.
Buck Mulligan frowned at the lather on his razorblade. He hopped

status: 257 differences

Appendix II

On SCM (Source Code Management) for use in DH

Ashlin Richardson

Unfortunately SCM systems do not provide a solution for the analysis of textual variation, for several reasons (an excerpt of [19] is reproduced here, as follows):

> *"SCM at its lowest level is based on calculating and recording the differences or 'deltas' between only two versions at a time, not the differences between all versions globally, as would be required for literary or linguistics texts. This applies even to a system like SCCS, which uses deltas interleaved within a single file (Rochkind, 1975).*
>
> *SCM systems are based on the needs of programmers, i.e. on 'configurations' of software, as well as revision information (Gulla et al., 1991). In SCM granularity is also usually the line or module, whereas in literary and linguistics texts a much finer resolution of a word or even a character is required.*
>
> *Versions in SCM are generally immutable (Munch, 1993), whereas for literary and linguistics texts versions are required to be always mutable. A programmer selects an old version of a program, edits it and commits the changed version back as a new text. The original version is necessarily preserved so it can be retrieved later. By contrast, an editor of a humanities text needs to select a particular version, work on it and save it back in its edited form, without changing the overall number of versions. Hence, although some techniques, such as algorithms for calculating differences, can be useful in formulating a solution to the current problem, actual SCM systems cannot be used to record textual variation".*

Even though SCM systems are designed to manage works (like software projects) that are actively being written (rather than study existing works) SCM's deserve a great deal of attention, on the basis that they may offer insight and inspiration towards the modeling of the temporal evolution of word structures as a proxy for the evolution of thoughts, which is increasingly relevant as more and more of our activities are subject to increasingly detailed and continuous recording.

"I may have oversystematized Ulysses" ~ James Joyce

What if Joyce used SCM? Without doubt, the resulting wealth of breadcrumbs to follow would provide substantial further elaboration on the significance of the more mythological content, shedding great illumination on the underlying motivations and higher meanings of his kaleidoscopic works.