About digital collation

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Text as process: Genetic and textual criticism in the digital age
University of Pittsburgh, 2016-04-05

Outline

- What is collation?
- The Gothenburg model
- Collation tools
  - CollateX
  - Juxta
  - Versioning machine

What is collation?

- *What:* Alignment and comparison of textual witnesses
- *Why:* Support text-critical analysis and edition
- *Input:* Multiple textual witnesses to the same work
- *Output:* Alignment of variants

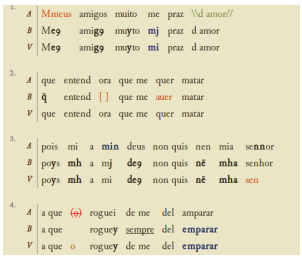
Types of variation

- Textual: insertion, deletion, mutation, transposition
- Substantive ~ non-substantive
  - Substantive: equipollent, linguistic, scribal error
  - Non-substantive: graphic
- Ignore non-substantive variation for comparison
  - Punctuation
  - Upper ~ lower case
  - Orthographic variation
    - Variant letterforms
    - Abbreviation

Types of output

1. Interlinear (synoptic) edition
   - Variant table
2. Critical apparatus
3. Variant graph
4. Stemma codicum
5. TEI XML
6. Etc.

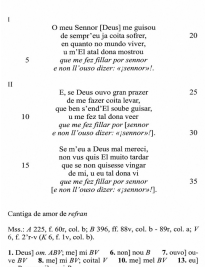
1. Interlinear (synoptic) edition



1.	A	Mmeus	amigos	muito	me	praz	\\d amor//		
	B	Meꝯ	amigꝯ	muyto	mj	praz	d amor		
	V	Meꝯ	amigꝯ	muyto	mi	praz	d amor		
2.	A	que	entend	ora	que me	quer	matar		
	B	q̃	entend	[ ]	que me	auer	matar		
	V	que	entend	ora	que me	quer	matar		
3.	A	pois	mi	a	**min**	deus	non quis	nen	mia	s**e**n**n**or
	B	poys	**mh**	a	mj	**deꝯ**	non quis	**nẽ**	**mha**	senhor
	V	poys	**mh**	a	mi	**deꝯ**	non quis	**nẽ**	**mha**	sen
4.	A	a que	(o)	roguei	de me	del	amparar			
	B	a que		roguey	sempre	del	**emparar**			
	V	a que	o	roguey	de me	del	**emparar**			

- Blocks: lines
- Rows: witnesses
- Columns: aligned tokens
- In this edition
  - Bold: graphic variation
  - Underline: equipollent reading
  - Orange: scribal error
  - Blue: linguistic variant
  - Other: deletions (red), insertions (green)

2. Critical apparatus



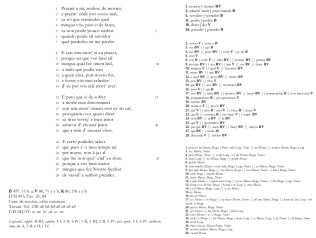
Cantiga de amor de *refran*

Mss.: *A* 225, f. 68r, col. b; *B* 396, ff. 88v, col. b - 89r, col. a; *V* 6, f. 2ˈr-v (*K* 6, f. 1v, col. b).

1. Deus] *om. ABV*; me] mi *BV* **6.** non] nou *B* **7.** ouvo] ouve *BV* **8.** me] mi *BV*; coital *V* **10.** me] mel *BV* **13.** eu]

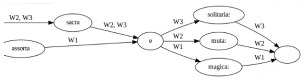
- Main text (reconstructed)
- Text type
- Traditio textus (witnesses and loci)
- Apparatus criticus (negative)
  - Location, lemma, reading, sigla

2. Critical apparatus



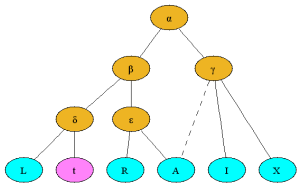
- Significant variants
  - Equipollent (textual)
  - Linguistic
  - Scribal error
- Insignificant variants
  - Graphic
- History of edition
  - Critical annotations from prior editions (negative)

3. Variant graph



- Directed graph
- Nodes: readings
- Rank: alignment
- Edges: witness labels

4. Stemma codicum



- Hypothesis about textual transmission
- Nodes
  - Greek sigla, ocher: hypothetical
  - Upper-case Latin sigla, aqua: extant manuscripts
  - Lower-case Latin sigla, violet: lost manuscripts
- Edges
  - Solid line: antigraph → apograph
  - Dotted line: contamination

5. TEI parallel segmentation

```
<l>
<app>
  <rdg wit="#one">se</rdg>
  <rdg wit="#two"><add>me</add></rdg>
  <rdg wit="#three">me</rdg>
</app>
atormentan
<app>
  <rdg wit="#one #two">en el jardín</rdg>
</app>
</l>
```

- Plain text: Shared textual reading
- <app>: Variation locus
- <rdg>: Textual variant
- @wit: Sigla of witnesses

6. Other output formats

- Plain text variation table
- HTML variation table
- XML variation table
- GraphViz DOT
- Etc.

The Gothenburg model

- History and goals
- Components
  1. Tokenization
  2. Normalization/regularization
  3. Alignment
  4. Analysis
  5. Visualization/output

The Gothenburg model: history and goals

- Developers of CollateX and Juxta
- Gothenburg 2009 joint workshop
- Sponsored by COST Action 32 and Interedition
- Identify core components of textual comparison at an abstract level

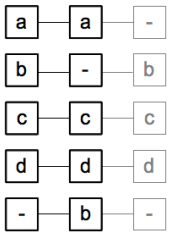
1. Tokenization

- (Presumes transcription and digitization)
- Divide the continuous text into units to be aligned (tokens)
- Typically whitespace-delimited words
  - May be at any level of granularity
  - "Syllables, words, lines, phrases, verses, paragraphs or text nodes"
- Challenges
  - Ambiguity
  - Punctuation
  - Contraction, superscription, etc.
  - Markup

2. Normalization/regularization

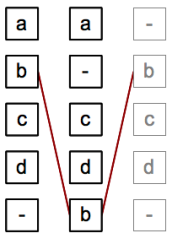
- Normalization during transcription ~ collation
- Ignore non-substantive variation for comparison
  - Punctuation
  - Upper ~ lower case
  - Orthographic variation
    - Variant letterforms
    - Abbreviation
- What goes into the output?

3. Alignment



- Alignment table
- Depth vs breadth
- Complications
  - Repetition
  - Transposition
  - Order effects
  - Computational complexity
  - Exact vs near (fuzzy) matching

4. Analysis/feedback



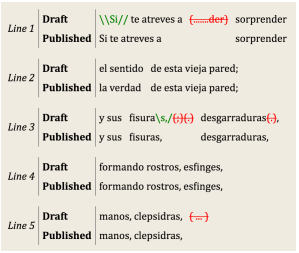
- Interpretation beyond linear alignment
- Manual intervention?

5. Visualization/output

- Markup, for further processing
  - XML, TEI, JSON, GraphViz DOT, LaTeX, etc.
- Textual alignment table, final form for edition
  - Plain text, HTML, PDF
- Textual visualization, for examination and analysis
  - Juxta
  - Versioning machine
- Graphic visualization, for examination and analysis
  - Variant graph

CollateX

- Java, Web app, and Python module
  - CollateX Java version:
    - http://collatex.net
  - CollateX Python package:
    - https://pypi.python.org/pypi/collatex
  - CollateX Python tutorial:
    - http://collatex.obdurodon.org
- Input: Anything at all (JSON)
- Output: Anything at all (JSON)



Juxta

- Stand-alone desktop application
  - Input: XML and plain text
  - Output: Analytic visualizations
    - Side-by-side collation view
    - Heat map
    - Histogram
    - Critical apparatus
  - Annotation and image support
- Juxta Commons (online tool)

Juxta collation features

- Selection of base text
- Normalization
  - Punctuation
  - Case
  - Whitespace
- Accept/reject revisions

Juxta disadvantages

- Limited options for normalization
- The base text must be a single, specific witness
  - Does not support a dynamic base text
- Loss of mark-up information other than addition and deletion
  - E.g., abbreviation, editorial regularization, etc.
- Limited control over the publication style

Versioning machine

- Visualizes alignment; does not perform collation
- Input: TEI aligned texts (parallel segmentation method)
  - Developer determines collation to prepare input
- Visualization features and facsimile image support

Using the Versioning machine for publication

- Displays multiple layers of textual information
  - Preserves markup
- Selection of default behaviors (well documented)
- Code reuse: customization (programming experience required)

Summary

- CollateX
  - Benefit: Complete control over input, tokenization, normalization, collation, and visualization
  - Limitation: Requires user programming (Python, possibly others)
- Juxta
  - Benefit: Analytical tools (histogram, heat map, annotation)
  - Limitation: No control over output, loss of markup information
- Versioning machine
  - Benefit: User control over output
  - Limitation: Requires TEI parallel segmentation input, output control requires user programming (XSLT, CSS)

Thank you!

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