

# Applications of digital humanities to the study of Slavic texts

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## Digital humanities

- Digital philology: editions
  - Diplomatic (manuscript)
  - Text-critical (text)
- Visualization
- Undergraduate course
  - “Computational methods in the humanities”
  - <http://dh.obdurodon.org>

# Projects

- Editions of manuscripts
  - “Paul the Simple”
  - *Codex Suprasliensis*
  - *Bdinski sbornik*
- Editions of texts
  - *Rus’ primary chronicle*
  - Constantinopole (Isabel Arranz)
  - “The story of Mary, Abraham’s niece”
- Digital codicology
  - The Repertorium
- Visualization
  - Daniil Zatočník (*Slovo and Molenie*)
  - Medieval saints as Facebook friends
  - Karolina Pavlova, *A double life*
- Digital history
  - *Rusian genealogy*

# Paul the Simple

Ι Διηγήστε ζε διάρκεια του θεού Ηρακλή και Κρόνους και έπειτα πλέοντες τώρα άδειαθμαν, περί όμη μελλούσαν, ήτοι Πλάσιος της θρησκείας γεωργίου, καθώς οι νεφρόπολις διάκος και διάκονος την ίδιαν, που αποτελούνταν από την ιεραρχία της θεοτοκίας κακοποίησης την γονινή της πόστον διέλαβανταν μαρτυράντων οι μητρούς αρρώνων. Επολέμων δε τέλος έξι άρρωστοι αιφνίδιων την ίδια ησυχία και σεβασμό την Πατένα. Και θεαματώντας ταύτην οι μάτρες συναρπάζοντας την άστρη της φύσης, οι θεοί την ονόμασαν Αστροπάτην ή την Αστροπάτη, από την ονομασία της αστρικής φύσης, ουρανού σύντομος, λέγουν «Αστροπάτη». Κατά την ιεραρχία της θεοτοκίας οι μάτρες με έναν άστρην ονόματι απέραντη, θελήσασαι σεμινάριο, έφωναν σύντομος, λέγουν «Αστροπάτη». Κατά την ιεραρχία της θεοτοκίας οι μάτρες με έναν άστρην ονόματι απέραντη, θελήσασαι σεμινάριο, έφωναν σύντομος, λέγουν «Αστροπάτη». Κατά την ιεραρχία της θεοτοκίας οι μάτρες με έναν άστρην ονόματι απέραντη, θελήσασαι σεμινάριο, έφωναν σύντομος, λέγουν «Αστροπάτη».

1 God's saint, Hierax, and Cronius and many other of the brothers told me this tale about these things that I now will speak, about Paul, a certain feld plowman, exceptionally innocent and simple as to his life. He had married a beautiful woman, of immortal nature, who was secretly cheating on him for a long time. Paul suddenly entered his house from the fields and found them behaving wickedly. Providence directed Paul to his own good, and seeing her with her usual lover, he laughed and shouted to them "Good, good! By Jesus, I don't care about it! Moreover, I no longer see her. Go, have her and her children, because I am going, and I will become a monk!"

Linguistic commentary	
夙夜不寐	3.p.sg.imperf.of 夙夜-ミ
夙: enclitic particle of consonant, after NERAKKE	
夙夜-ミ	for CÄTÄN. Negation. sc. agr. w/ HÄYÄ
夙夜-ミ	Negation of DOSEN, postadj. of DÄTA, agr.w/ HÄYÄ
夙夜-ミ	Neg. of man-pers.name, subj. of S, erg. w/ KÄNNÖ
H. conj.	link HÄPÄD and KÄNNÖ
КÄNNÖ	Q of KÄNNÖ and postadj. of S.towg. HÄPÄD
H. conj.	link HÄPÄD, KÄNNÖ, and HNN
HNN	Npl.masc. of pro.adj. used as noun, rôle of, 5 along w/ HÄPÄD and KÄNNÖ
всегда	Masc.nom. of pron.adj. всегда, mod. HNN
всегда	prep. G, goes w/ CÄTÄN
с	C of ergative-4, coll. used as noun, rôle of, 5 along w/ HÄPÄD, G after VTA

**Search “Paul the Simple”**

Main Paul site: [http://clover.slavic.psu.edu:8081/exm/paul/paul\\_main.html](http://clover.slavic.psu.edu:8081/exm/paul/paul_main.html)

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**Search by lemma**

Select the lemmas you would like to find:

Submit

**ГЛАДИЙ (2)**  
 ГЛАДИЙ (1)  
 гла-о (1)  
 АА (1)

**Search by morpholog**

• Adjective  
• Noun  
• Number  
• Personal pronoun  
• Instrumental objective  
• Verb  
• Other (adverb, conjunction, particle)

**Adjective (47)**

Gender:  [any] (47)  Number:  [an]  **ПУНЧАСКИЙ (1)**  
 ЕД КЛЕО (1)

Definite:  [any] (47)  Degree:  [very]  
 КРІ (1)  
 КРЕКІ (1)  
 крімъ, крі, кріс.

Submit

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**Nouns (113)**

Declension:  [any] (113)  Gender:  [any] (113)  Number:  [any] (113)  Case:  [any] (113)

“Paul the Simple” grammatical report									
Found 8 items with lemma = ΗΠΗ									
Item	Verso	Folio	Greek	Part of Speech	Regular	Tense	Person	Number	Aorist Type
ΗΑΓ	2	86r	Ἀπίγεται	verb	irreg	aor	3	sg	unstressed
ΗΑΗ	1	86r	Ἐποιεῖ	verb	irreg	inv	2	sg	
ΗΑΗ	2	86r	Ἐπένθησε	verb	irreg	inv	2	sg	
ΗΑΗ	3	86v	Ἐπελέθε	verb	irreg	inv	2	sg	
ΗΔΗ	1	86r	Ὥριδυο	verb	irreg	pr	1	sg	
ΗΔΗ	11	87v	Ὥριδυο	verb	irreg	pr	1	sg	
ΗΩΗΔ	12	87v	Ἐξαγόρασε	verb	irreg	pr	1	sg	
ΗΠΗ	4	86v	Ἀπένθησε	verb	irreg	inf			

**Search “Paul the Simple”**

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Main Paul size: [http://clover.silvic.psu.edu:8081/exist/paul/data/paul\\_main.html](http://clover.silvic.psu.edu:8081/exist/paul/data/paul_main.html)

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**Search by lemma**

Select the lemmas you would like to find: [any] (358)

---

**Search by morphological category**

- Adjective
- Noun
- Number
- Personal pronoun
- Pronominal adjective
- Verb
- Other (adverb, conjunction, particle, preposition)

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**Adjective (47)**

Gender: [any] (47)  | Number: [any] (47)  | Case: [any] (47)

Definite: [any] (1)  | Masculine: [any] (3)  | Neuter: [any] (2)  | Feminine: [any] (2)

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**Nouns (113)**

Declension: [any] (113)  | Gender: [any] (113)  | Number: [any] (113)  | Case: [any] (113)

“Paul the Simple” grammatical report									
Found 9 adjectives with case = *, gender = f, number = *, definiteness = *, and degree = *									
Item	Verse	Folio	Lemma	Greek	Gender	Case	Number	Definite	Degree
ΙΔΑΥΑΝΟΝ ΚΙΛΑ	12	87v	ΙΔΑΥΑΝΟΝ-	Ιδαύανον	f	G	sg	def	pos
ΙΔΑΥΑΝΟΝ ΙΔΑΥΑΝΟΝ	9	87v	ΙΔΑΥΑΝΟΝ-	ητὸς ἀδενόν	f	A	sg	def	pos
ΖΕΛΩΝ ΖΕΛΩΝ	1	86r	ΖΕΛΩΝΦΑΣΙ-	κανενῶσι	f	I	sg	indef	pos
ΚΡΑΣΙΝΟΝ	1	86r	ΚΡΑΣΙΝ-	μάραντην	f	I	sg	indef	pos
ΟΙΔΑΥΑΝΟΝ	1	86r	ΟΙΔΑΥΑΝ-	πολι σινθείσιν	f	I	sg	def	pos
ΠΟΙΓΕΙΤΩΝ	4	86v	ΠΟΙΓΕΙΤΩΝ-	γέλεις	f	N	sg	def	pos
ΠΟΙΓΕΙΤΑΙΛΕΙΤΑ	2	86r	ΠΟΙΓΕΙΤΑΙΛΕΙ-	ητὸς δέρμαν	f	G	pl	def	pos
ΟΙΔΕΡΩΝΗ	9	87r	ΟΙΔΕΡΩΝ-	τελεία	f	N	sg	indef	pos
ΧΡΙΣΤΟΣΑΝ	9	87r	ΧΡΙΣΤΟ-	του θεοῦ	f	I	sg	indef	pos

"Paul the Simple" full-text search report					
Found 11 Items containing "astron"					
Item	Verse	Folio	Lemma	Greek	Part of Speech
μΠΤΩΜΗ	2	86r21	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	2	86r23	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	3	86v1	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	3	86v12	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	4	86v23	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	9	87v2	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	11	87v9	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	11	87v15	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	2	86r19	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	9	87v8	μΠΤΩΜΗ-2	Ἄστρονος	noun
μΠΤΩΜΗ	11	87v16	μΠΤΩΜΗ-2	Ἄστρονος	noun

## New digital editions of manuscripts

- *Codex suprasliensis*
  - <http://suprasliensis.obdurodon.org>
- *Bdinski sbornik*
  - Ghent Slavonic Ms 408, A.D. 1360
  - <http://bdinski.obdurodon.org>

## Manuscripts and texts: background

- Manuscripts
  - Unique physical objects
  - Diplomatic edition
  - Codicological study
- Texts
  - Abstract, reified in manuscripts
  - Collation of witnesses, analysis of variation
  - History of textual transmission (stemmatology)
- Language?

## Manuscripts and texts: digitization

- Background
  - The only material reality is the manuscript
  - Textual information is encoded in the manuscript
  - The human reads selectively at different levels (manuscript, text, language)
- Tasks
  - Can we use the same digital files for both types of editions?
  - Can we combine the two in a single workstation framework?

## *The Rus' primary chronicle*

- Five principal witnesses
  - Text dates to early twelfth century
  - Oldest ms is *Lav* (1377)
- Full interlinear collation
  - Harvard UP, 2004; 3 v., 2368 p.
  - Aligned by “Karskij line”
  - Aligned by word

## “The story of Mary, Abraham’s niece”

- Part of the “Life of Abraham of Qidun”
  - Included in the *Paraenesis* of Efrem the Syrian
  - Syriac original, translated from Greek into Slavonic
- More than 40 known witnesses, most of the *Paraenesis*
- Slavic textology presupposes Greek textology
  - Cf. Mario Capaldo’s Greek parallels to the *Codex Suprasliensis*

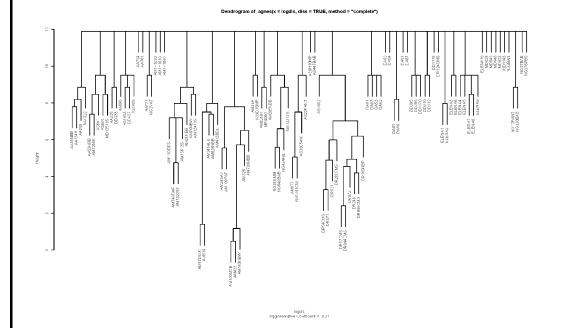
## The Repertorium

- *Repertorium of Old Bulgarian literature and letters*
- *Mixed-content miscellany* manuscripts are similar in the selection and arrangement of their contents
- Which manuscripts are similar to which other manuscripts in the corpus in their contents?
- How can we best visualize the relationships?
  - The old way: lists, tables
  - The new way: dendograms, plectograms

## Tables

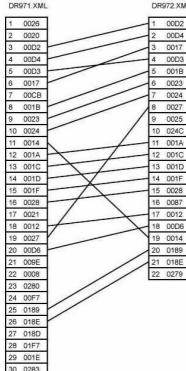
	MS1	MS2	MS3	MS4	MS5	MS6	MS7	Etc.
Curly	1	4	...	...	...	...	...	...
Larry	2	6	...	...	...	...	...	...
Moe	3	7	...	...	...	...	...	...
Laurel	4	18	...	...	...	...	...	...
Hardy	5	19	...	...	...	...	...	...
Abbot	6	20	...	...	...	...	...	...
Costello	7	24	...	...	...	...	...	...
Groucho	8	25	...	...	...	...	...	...
Harpo	9	26	...	...	...	...	...	...
Chico	10	13	...	...	...	...	...	...
Etc.	...	...	...	...	...	...	...	...

## Dendrogram



## Plectogram

- Trebniki (prayer books)
- Strong thematic unity
- Levels of coincidence
  - Individual articles
  - Sequences
- Microsequences

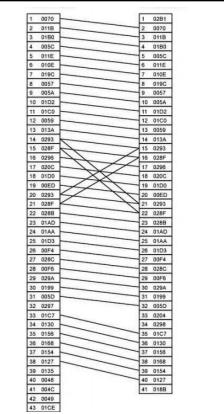


## Plectograms

- “[P]lectograms [...] are presented as working aids showing the degree of existing relationship, not as proposed genealogical models.” (125)
- “[T]he device lets us see at a glance the contours of the relationship. It allows us to give focus and priority to information that otherwise would be unwieldy; it allows us to set manageable small tasks for further work in strategic sampling of textual and other relationships.” (131)

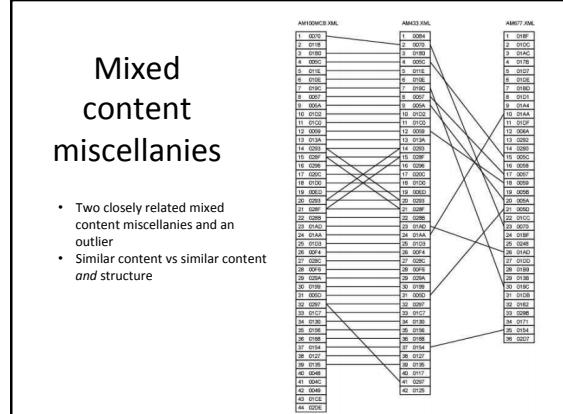
## Mixed content miscellanies

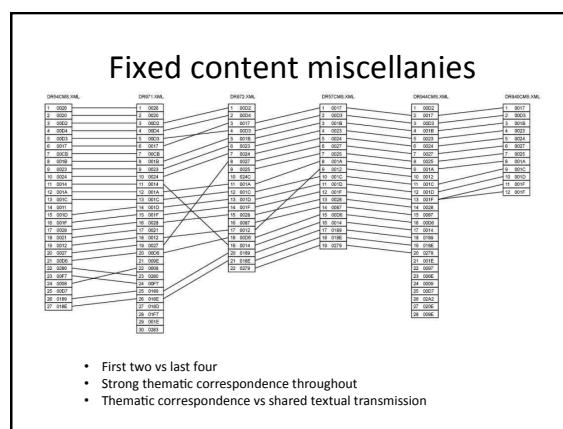
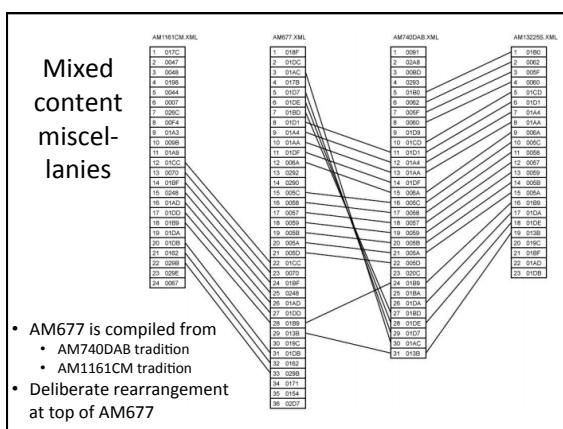
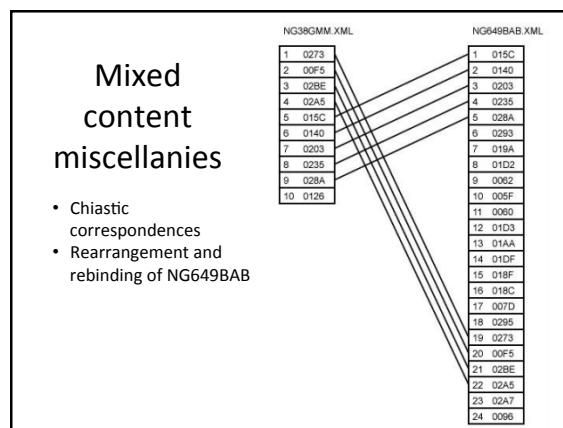
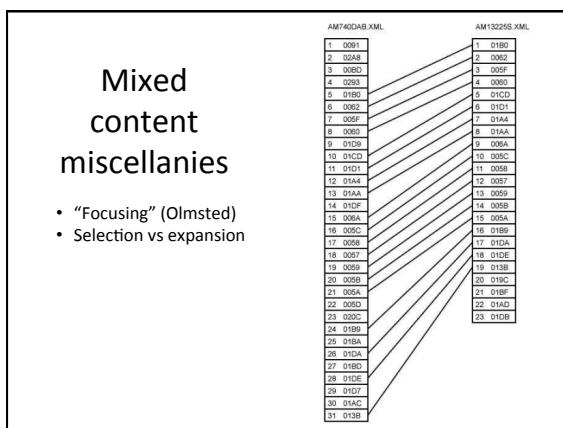
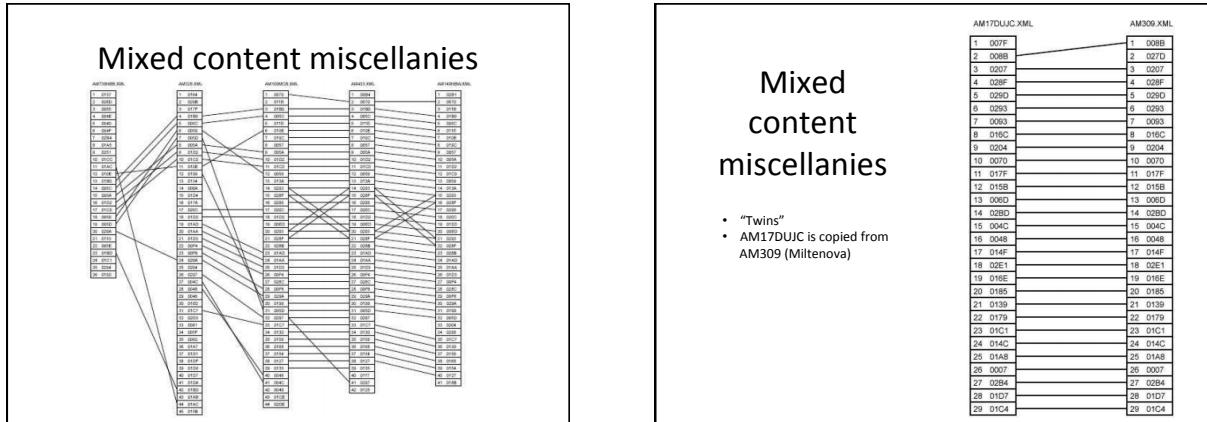
- Very strong sequences
- Two pairs of texts appear twice each, in the same order and position
- Why twice?
  - Compilation from multiple sources
- Why twice in two manuscripts?
  - Direct copying?
- Mind the gap
  - 0297 “Questions of St. John the Theologian to Abraham”
  - 0298 “Questions of St. John the Theologian to Abraham, fragment”



## Mixed content miscellanies

- Two closely related mixed content miscellanies and an outlier
- Similar content vs similar content and structure





## Visualization

- Daniil Zatočník (*Slovo* and *Molenie*)
- Medieval saints as Facebook friends
- Karolina Pavlova, *A double life*

## Daniil Zatočník

- Florilegium (gnomic wisdom)
- The *Slovo* and *Molenie* are different works (not just texts) with shared textual material
- How can we represent and explore the relationships between the works?
- The old way: lists, tables
- The new ways: plectogram, dynamic synchronization

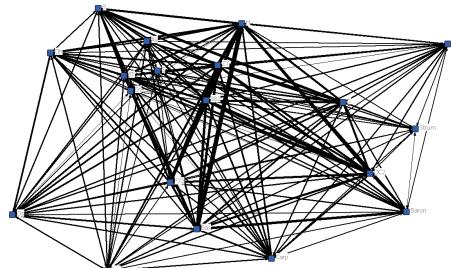
## Medieval saints as Facebook friends

- Gospel and Apostol manuscripts may include a calendar of saints
- Shared entries suggest shared textual transmission
- What is the “social network” described by shared entries?

## Facebook?!

- Manuscripts and saints are Facebook users
- Manuscripts “friend” saints by including them
- Manuscripts cannot friend manuscripts directly ...
  - ... but there’s an indirect network relationship based on the saintly friends they share
- Infer a weighted relationship between manuscripts

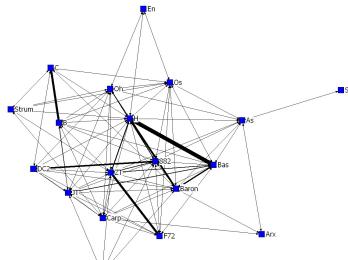
## The social network “hairball”



## “Loser” saints

- The social network “hairball”
  - Most saints occur in lots of manuscripts
  - Most manuscripts have roughly comparable connectivity
  - Too many lines, too poorly differentiated
- Loser saints have only two manuscript friends
  - Common shared values don’t differentiate within the corpus
  - Throw away data when it distracts from information

## The loser network



Karolina Pavlova, *A double life*

- Cecilia, the protagonist, is the most present character in the novel.
  - What is the relationship between presence and agency?
  - Does she speak and act? Or is she present because others talk about her?
  - How does her role change over the course of the novel?
  - What, more generally, are the roles of men and women with respect to presence, speech, and agency? Old and young?
  - <http://pavlova.obdurodon.org>

## Rusian genealogy

- Riurik genealogy
  - Dynastic marriage
  - Personal data
  - Search by name, place, regnal year
  - Under development: dynamic family trees

## Summary: Projects

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