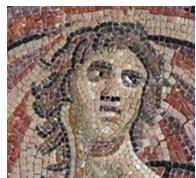


HYLAS

A metrical search engine
for Greek and Latin poetry

<https://miketueller.github.io/article/hylas-at-scs/>



HYLAS a metrical search engine

VIRGIL'S *GEORGICS* AND THE ART OF REFERENCE

RICHARD F. THOMAS

Harvard Studies in Classical Philology 90 (1986): 171–198.

p. 179:

A special type of reference within this category is what I would call “technical reference,” by which I mean that the poet deals not so much in reshaping an entire line or number of lines but rather, through the use of a morphological oddity, rhetorical figure, metrical or rhythmical anomaly, or even by numerological criteria, intends to send his reader to a specific model.



HYLAS a metrical search engine

ἥδ' ἔγὼ ἡ τοσάκις Νιόβη λίθος, δόσάκι μήτηρ·
δύσμορος, ἡ μαστῶν {ύγρὸν} ἔπηξα γάλα,
Ἄϊδεω πολὺς ὅλβος ἐμῆς ὀδῖνος ἀριθμός,
ἢ τέκον, ὥ, μεγάλης λείψανα πυρκαϊῆς.

ἄλεο δὴ πρὸ γάμοιο, Φιλαίνιον, οὐδέ σε μάτηρ
Πυθιὰς ὠραίους ἤγαγεν εἰς θαλάμους
νυμφίου· ἀλλ' ἐλεεινὰ καταδρύψασα παρειὰς
τεσσαρακαΐδεκέτιν τῷδ' ἐκάλυψε τάφῳ.

— √ √ — √ √ — √ √ — √ √ —
— √ √ — — — √ √ — √ √ —
— √ √ — √ √ — √ √ — — √ √ —
— √ √ — √ √ — — √ √ — √ √ —

I, here, am Niobe, a stone as many times as a mother.
Unfortunate, I made solid the watery milk of my breasts. The
number of my labor-pangs was a great wealth for Hades: I
bore children for him. Oh! the remains of a great pyre!
—Lollius Bassus (1st C. CE), AP 7.386

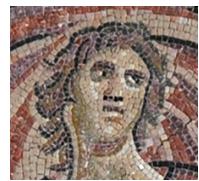
You perished before your marriage, Philaeum, and your
mother Pythias did not bring you in season to the chamber of
your bridegroom; but piteously she gouged her cheeks and
veiled you with this tomb at the age of **fourteen**.
—Perses (4th/3rd C. BCE), AP 7.487



HYLAS a metrical search engine

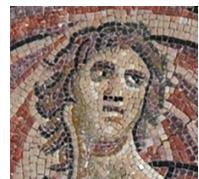
Rules for scansion:

1. If the syllable has a long vowel or diphthong, it's long.
2. If the syllable has a short vowel followed by two or more consonants, it's long, *unless ...*
3. those two consonants are a *mute followed by certain semi-vowels*, in which case it could go either way.
4. Short vowels followed by one consonant or no consonants are short.
5. The last syllable in the line always counts as long.



HYLAS a metrical search engine

Line of poetry

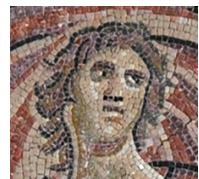


HYLAS a metrical search engine

Dictionary

“Rules of Thumb”

Line of poetry



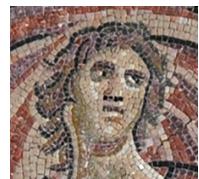
HYLAS a metrical search engine

Dictionary

“Rules of Thumb”

Line of poetry

List of syllables, with vowels marked L/S/U



HYLAS a metrical search engine

Dictionary

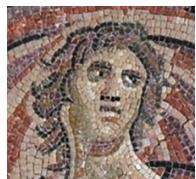
“Rules of Thumb”

Line of poetry

Predictive model for
syllable combination

List of syllables, with vowels marked L/S/U

List of syllables, with vowels marked L/S/U



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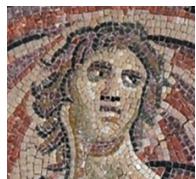
Predictive model for
syllable combination

List of syllables, with vowels marked L/S/U

Predictive model for
syllable length

List of syllables, with vowels marked L/S/U

List of syllables, each marked L/S
with attached probability



HYLAS a metrical search engine

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“Rules of Thumb”

Line of poetry

Predictive model for
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List of syllables, with vowels marked L/S/U

Predictive model for
syllable length

List of syllables, with vowels marked L/S/U

Allowable patterns for the
governing meter

List of syllables, each marked L/S
with attached probability

Syllable quantity sequence (e.g.
LSSLSSLLLSSLSSLL), with overall “score”



HYLAS a metrical search engine

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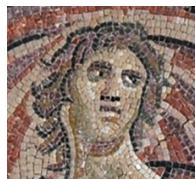
List of syllables, with vowels marked L/S/U

Allowable patterns for the
governing meter

List of syllables, each marked L/S
with attached probability

Syllable quantity sequence (e.g.
LSSLSSLLLSSLSSLL), with overall “score”

Top-scoring line



HYLAS a metrical search engine

Dictionary

“Rules of Thumb”

Line of poetry

Predictive model for syllable combination

List of syllables, with vowels marked L/S/U

Predictive model for syllable length

List of syllables, with vowels marked L/S/U

Allowable patterns for the governing meter

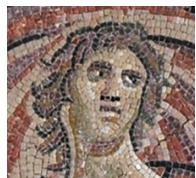
List of syllables, each marked L/S with attached probability

Grammar-based rules;
rote learning

Syllable quantity sequence (e.g. LSSLSSLLLSSLSSLL), with overall “score”

Top-scoring line

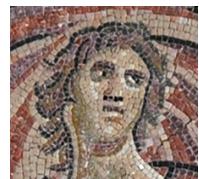
Top-scoring line, with word-breaks marked



HYLAS a metrical search engine

The dataset

Homer	Callimachus	Quintus	Vergil (including appendix)
<i>Homeric Hymns</i>	(<i>Hymns</i>)	Smyrnaeus	Valerius Flaccus
Hesiod	Colluthus	Catullus	Juvenal
Theognis	Moschus	Lucretius	Lucan
Apollonius	Oppian	Horace	Martial
Rhodius	Theocritus	Ovid	Persius
Aratus	Tryphiodorus	Propertius	Statius
Bion	<i>Greek Anthology</i>	Tibullus	
	Nonnus		



HYLAS a metrical search engine

Back-end outputs

- Lots more statistics in tabular form
- Trace stats back to lines



HYLAS a metrical search engine

Similar projects

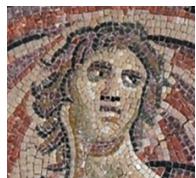
- Papakitsos, “Computerized Scansion of Ancient Greek Hexameter,” *Literary and Linguistic Computing* 26(1) (2011): 57–69.
- Schumann, Beierle, and Blößner, “A Finite-State Approach to Automatic Greek Hexameter Analysis,” *DH2019*.
- Fusi, *Chiron* (fusisoft.net/chiron).
- Winge, *Latin Macronizer* (alatius.com/macronizer).
- Chamberlain, *Greek and Latin Meter* (at hypotactic.com).
- Colombi et al., *Pede Certo* (pedecerto.eu).



HYLAS a metrical search engine

Chiron (Daniele Fusi) (fusisoft.net/chiron)

- Part of a modular system for text analysis
 - Tested on Greek and Latin, but created to be multi-lingual
 - Chained “layers” of analysis, including:
 - phonology
 - syntax
 - metrical scansion
 - Still under development
 - Word-breaks seem to have been a problem here too!



HYLAS a metrical search engine

Latin Macronizer (Johan Winge)
(alatius.com/macronizer)

- Ceased development in 2017
- Latin only
- Marks up user input; no searching capability
- Uses a robust dictionary
- A few scansion remain ambiguous

A Latin Macronizer

Please enter a Latin text!

Mark long vowels.

Also mark *māius* etc.

To improve the result, try to scan the text as .

Compare result with correctly macronized input text.

Convert u to v.

Convert i to j.

(Please be patient!)

Result

(Ambiguous forms are marked yellow; unknown forms are orange. You ma

SSDDDT

DDSSDS

SSDSDS

DSDDDT

DSDSDS

DSSDDS

SDSSDT

SDSSDS

DSSSDS

DSSSDT

SDSSDS

nec nōn et līnī segetem et Cereāle papāuer
tempus humō **tegere** et iamdūdum **incumbere** arātrīs,
dum **siccā** tellūre licet, dum **nūbila** pendent.
uērē **fabis** satio; tum tē quoque, **medica**, putrēs
accipiunt sulcī et miliō **uenit** annua cūra,
candidus **aurātis** aperit cum cornibus annum
Taurus et āuersō cēdēns **Canis** **occidit** astrō.
at sī triticeam in messem **rōbustaque** farra
exercēbis humum **solisque** instābis aristīs,
ante tibi Eōae Atlantidēs abscondantur
Cnōsiaque **ārdentis** dēcēdat **stella** Corōnae,
dēbita quam sulcīs committās sēmina quamque
inuitae properēs anni spem **crēdere** terrae.



HYLAS a metrical search engine

Greek and Latin Meter (David Chamberlain) (hypotactic.com)

- Much corrected, or even entered, by hand
- No search or user-entered text, but has a large database
- Both Greek and Latin
- Many different meters (even lyric!)
- An attractive user interface

1

Pindar,

Olympian 1::ΙΕΡΩ

Strophe 1

ἀ ριστον μὲν ὕ δωρ, ὁ δὲ χρυσὸς αἰθόμενον πῦρ
ἄ τε δι σπρέπει νυκτὶ μεγάνορος ἔ ξοχα πλούτου· 1
εί δ' ε θλα γαρύεν 2
ἔλδεαι, φίλον ἥ τορ,
μηκέτ' ἀελίου σκόπει 3
ἄλλο θαλπνότερον ἐν ἀ μέρᾳ φαεννὸν ἄ στρον ἐ ρήμας δι
μηδ' Ὄλυμπίας ἀ γῶνα φέρτερον αύδάσομεν. 4
ὅ θεν ὁ πολύφατος ὕ μνος ἀμφιβάλλεται 5
σοφῶν μητί εσσι, κελαδεῖν 6
Κρόνου παῖδ' ἐς ἀφνεὰν ἵ κομένους 7
μάκαιραν Ἱ ἐ ρωνος ἐ στίαν, 8



HYLAS a metrical search engine

Pede Certo (Emanuele Colombi et al.)
(pedecerto.eu).

- Algorithmic scansion, plus some corrected by hand
- Latin only (from a large data set)
- Search by pattern, word-breaks, hiatus, and elision/synaloepha
- Search one line of dactylic hexameter or elegiac pentameter
- Attractive user interface

The screenshot shows the pedecerto.eu website interface. At the top, there's a logo featuring a classical figure and the text "pedecerto". Below the logo is a blue header bar with buttons for "Indexes", "Export", "Statistics", and "New search". The main content area displays a search result for hexameters. It shows a visual representation of a hexameter line with yellow boxes indicating syllables and a 'x' for a break. To the right, it says "13291 hexameters found (6.2)". Below this are navigation links (<<, <, 5, 6, 7, 8, 9, >, >>) and a list of search results. Each result consists of a line number, a reference, and the corresponding Latin text with its metric structure indicated by vertical bars and red highlights for elisions.

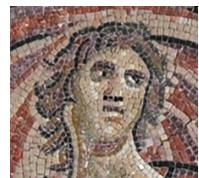
VERG. georg. 4, 69	Cōntinūōque_ănímōs uulg
VERG. georg. 4, 80	Prācīpítēsquē_ cädúnt; nō
VERG. georg. 4, 105	Ínstabíllis ănímōs lüdō pr
VERG. georg. 4, 114	Ípsē läbörē_ mänúm dūrō
VERG. georg. 4, 128	Iúgérā rúrīs_ ēránt, nēc fér
VERG. georg. 4, 133	Nóctē dōmúm dāpibús m
VERG. georg. 4, 148	Prātērēo_ átque_ állīs pōst
VERG. georg. 4, 189	Pōst, übī iám thälämíš sē



HYLAS a metrical search engine

Future directions

- Expanded word dictionary functions
- Bigger dictionaries
- Accounting for metrical appositives
- A user interface that allows search for more meters
- More texts



HYLAS a metrical search engine

Questions? Corrections?

<http://www.hylas.org>

mike_tueller@asu.edu

<https://miketueller.github.io/article/hylas-at-scs/>