

# Treasures and Traps on the Intersection of Data, Humanities and Computing

Marieke van Erp  
KNAW Humanities Cluster  
DHLab

 merpeltje  
marieke.van.erp@dh.huc.knaw.nl







Ph.D. Computational Linguistics 2010

NLP, Semantic Web & Digital Humanities

Research group leader DHLab  
@KNAW Humanities Cluster

Scientific Director ICAI Cultural AI Lab

Current research: ERC CoG Trifecta,  
Culturally Aware AI

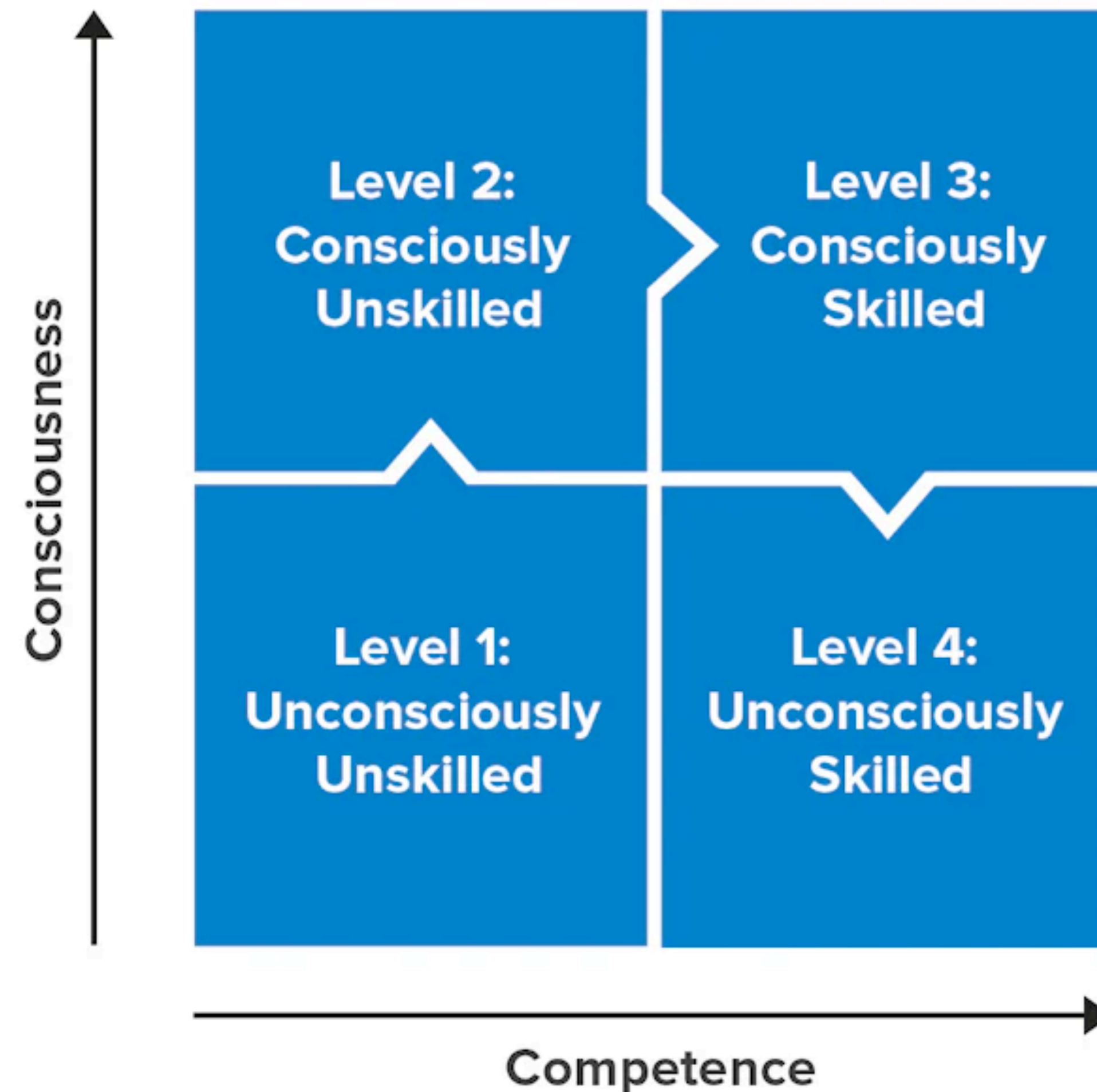
Academic because:  
I get to solve puzzles every day

Surfer, swimmer, chocoholic

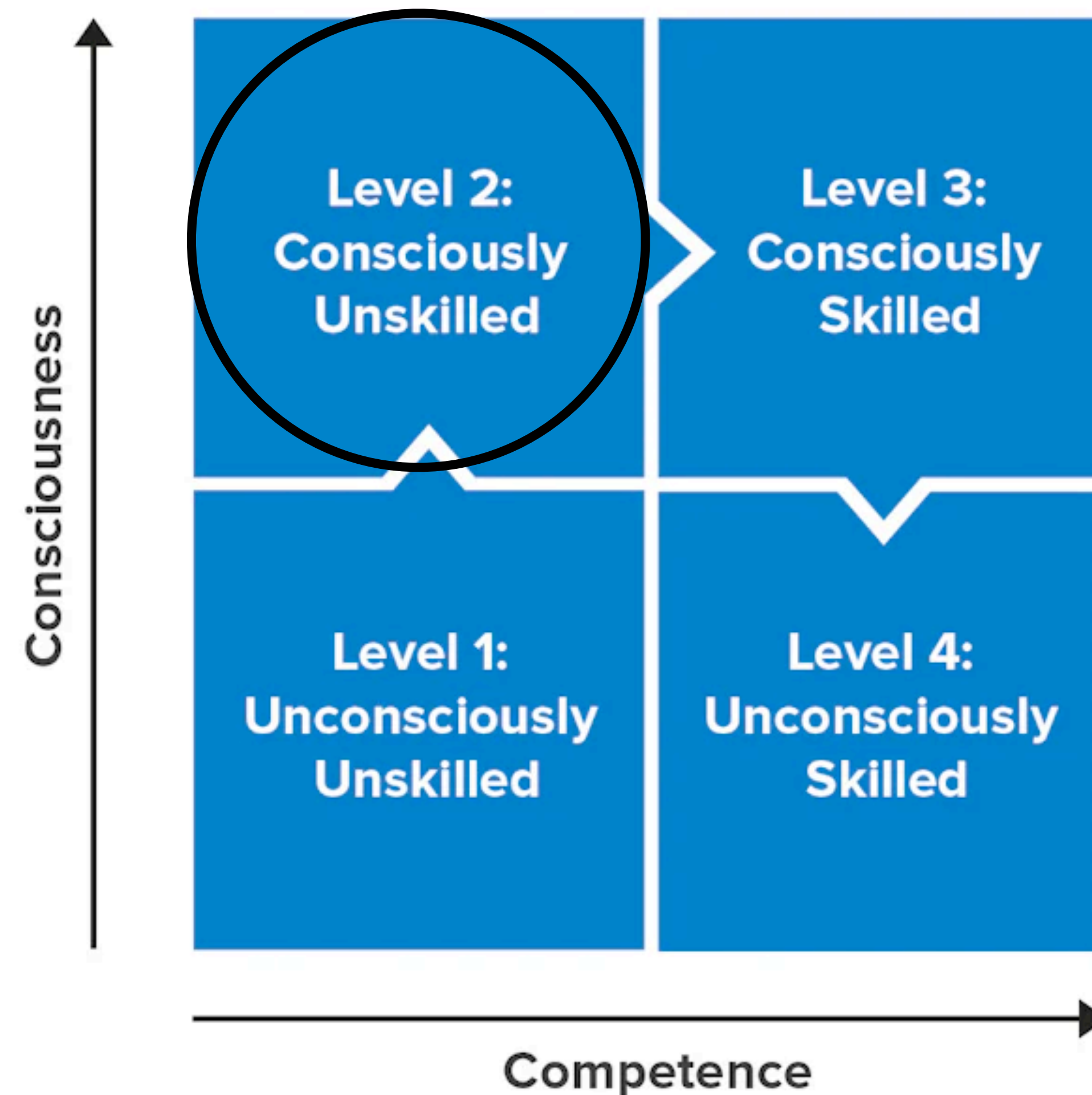
Visiting WIMMICS for Thematic Semester Digital  
Humanities & AI sponsored by AISSAI CNRS



# Knowing what you don't know



# Knowing what you don't know





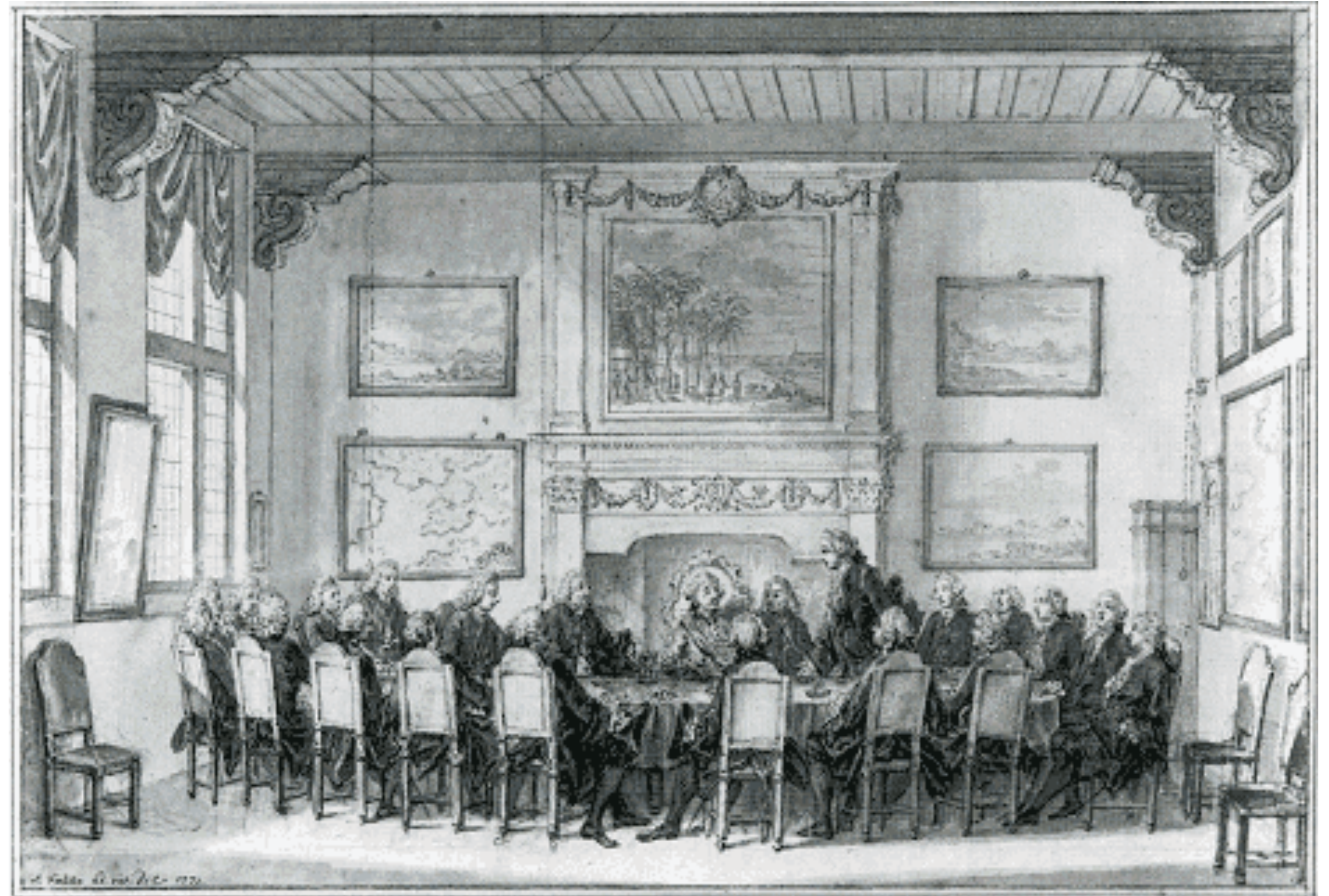
# Unflattening Knowledge Graphs





# Dutch East India Company (VOC)

- Founded 1602, dissolved 1799
- Trade company
- At its peak:
  - 57,000 employees
  - 150 merchant ships
  - 40 warships
  - 10,000 soldiers





# VOC Archives (a selection)

- Employment records  
Amsterdam chamber (~800,000)
- 8,194 Voyages: ship name, master, dates and location for departure and arrival, particulars of the voyage
- 245,405 cargo items: per voyage, including weight and value
- 923 'general missives': yearly reports from the local governors to the Amsterdam board





# Tracing Opium

- VOC is most known for spice trade
- Also: opium and slave trade activities
- How can one assess the importance of a product to the VOC?
  - Analysis mentions in general letters & cargo logs



Jiaqi Zhu, Vera Provatorova, Jelle van Lottum and Marieke van Erp - Smoke and Mirrors: Tracing the Influence of the Opium Trade in the Dutch East India Company through Letters and Cargo Logs. DHBenelux 2024. Leuven 4-7 June, 2024

Image source: <https://cdn.britannica.com/47/78747-004-BEB443F8/man-Chinese-opium-wood-engraving.jpg>



# 607 letters

CLARIAH / wp6-missieven

Search: Type to search

Code Issues Pull requests Actions Projects Wiki Security Insights

wp6-missieven Public

Watch 6 Fork 2 Star 5

master 1 Branch 14 Tags

Go to file Add file Code

|                      |  |                        |              |
|----------------------|--|------------------------|--------------|
| dirkroorda           | entity notebook                              | 38a2ab0 · 2 months ago | 101 Commits  |
| .jupyter             | entity notebook                              |                        | 2 months ago |
| app                  | entity nodes and ent nodes                   |                        | 2 months ago |
| blacklab             | docs and tutorials update                    |                        | 6 months ago |
| change               | adding volume 14 completed                   |                        | 2 years ago  |
| corrections          | more data corrections                        |                        | 3 years ago  |
| docs                 | docs and tutorials update                    |                        | 6 months ago |
| exercises            | tutorials updated                            |                        | 2 years ago  |
| legacy               | all footnotebodies have detection score 100% |                        | 4 years ago  |
| ner                  | entity nodes and ent nodes                   |                        | 2 months ago |
| pdfreport/2022-03-09 | docs   |                        | 2 years ago  |
| programs             | entity nodes and ent nodes                   |                        | 2 months ago |

## About

General Missives in Text-Fabric

[resources.huygens.knaw.nl/vocgenera...](#)

- nlp
- history
- dutch
- corpus-linguistics
- corpus-data
- corpus-tools
- corpus-processing

- Readme
- MIT license
- Activity
- Custom properties
- 5 stars
- 6 watching
- 2 forks

Report repository

## Releases 14

With entity and ent nodes **Latest**  
on Mar 27

# Opium Mentions

- opium was rarely mentioned in the GM before the middle of the seventeenth century
- but it started to appear frequently after the middle of the seventeenth century, especially during the 1720s.
- How to interpret the dynamics in the figure? We need historians' help

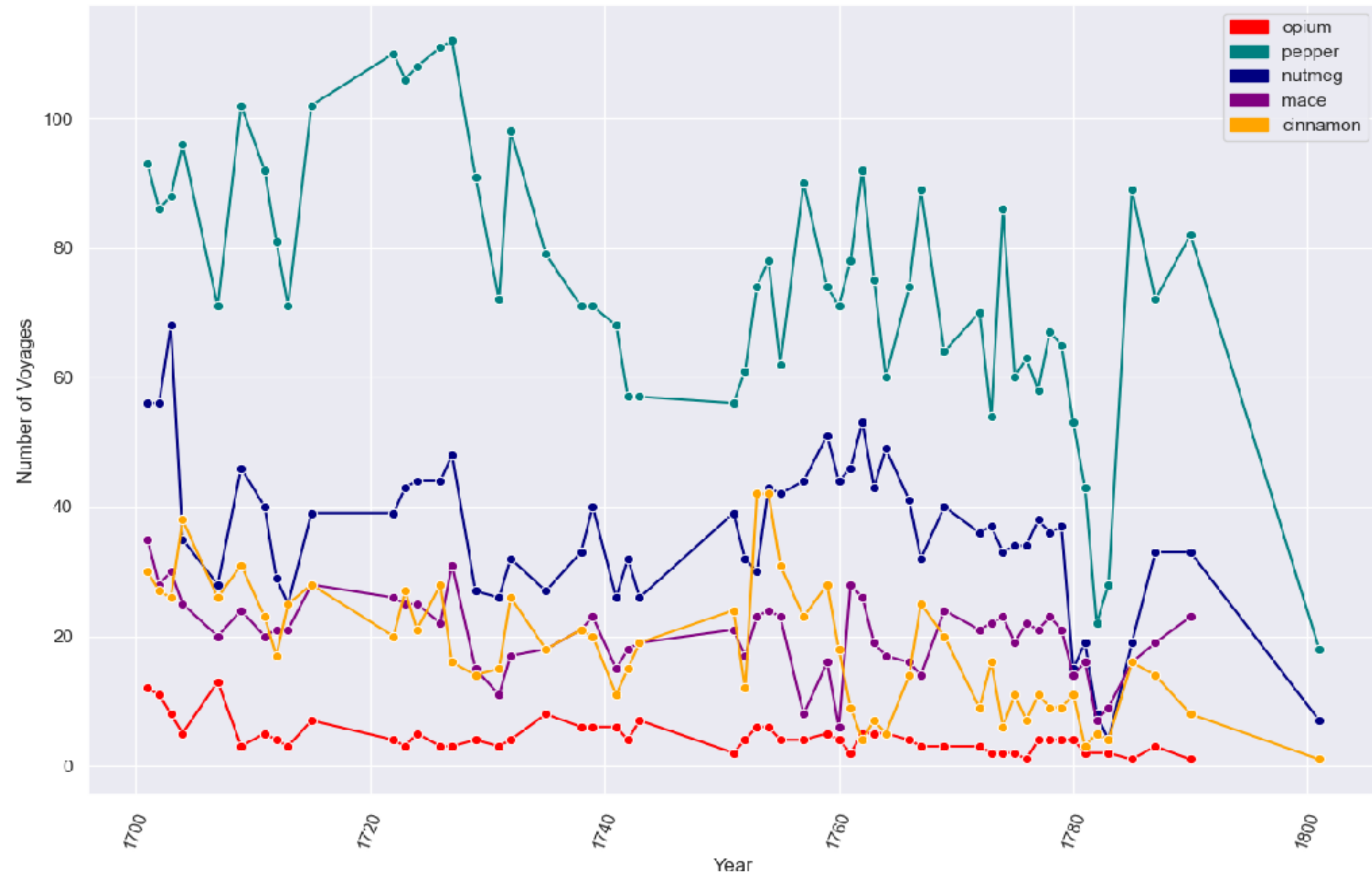


Appearances of opium in the GM over time compared to the most common spices



# Occurrences in Bookkeeper General Batavia (cargo logs)

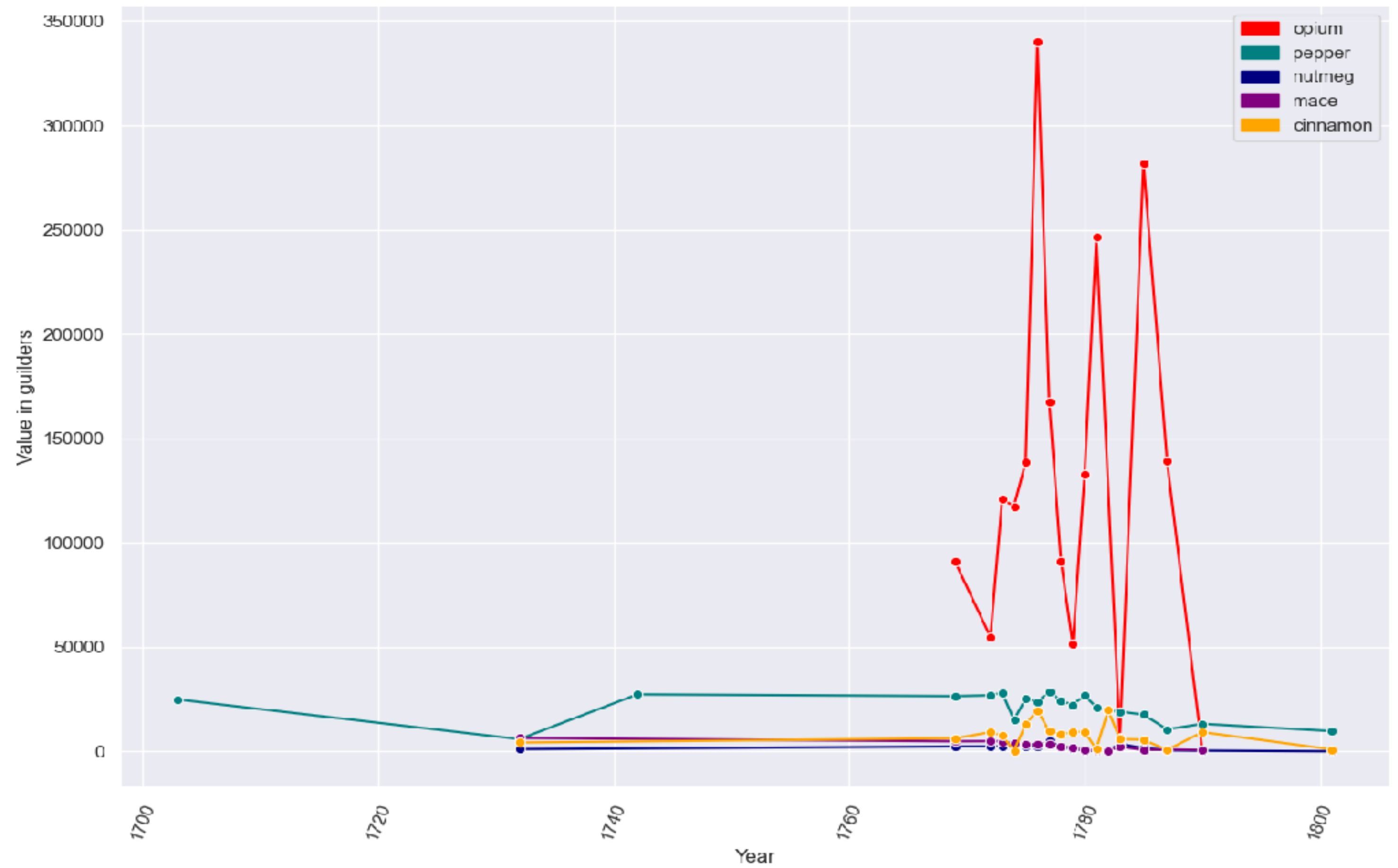
- the distribution of VOC ships per year that had opium, nutmeg, mace, pepper or cinnamon on their cargo lists in the eighteenth century.
- the opium trade was relatively stable as compared to the spices.



Number of times a commodity was listed as cargo per year according to Bookkeeper General Batavia

# Opium Value

- the value of opium was very unstable during 1769-1787
- why unstable?
- data gaps

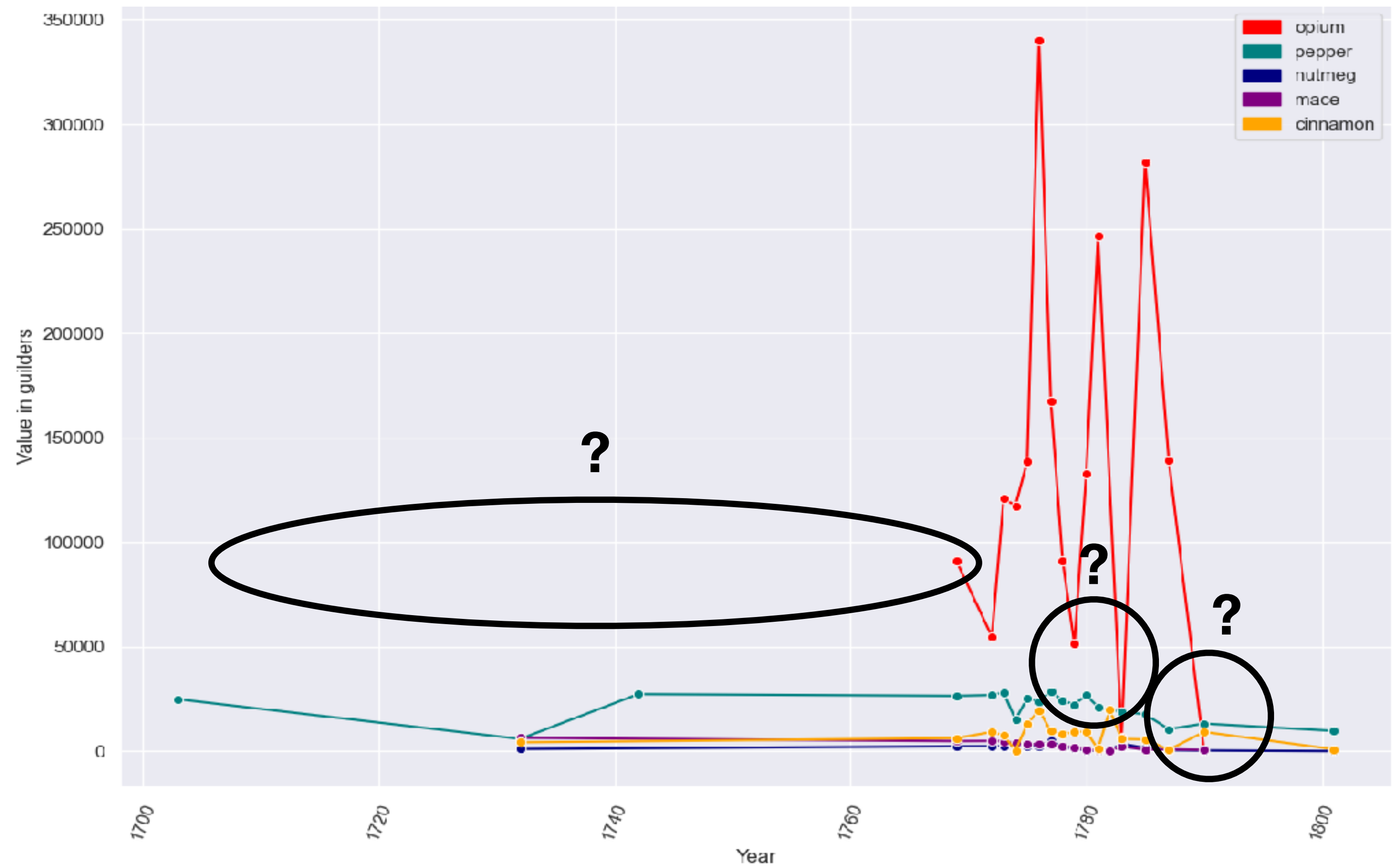


Average value of a commodity per year according to BKB



# Opium Value

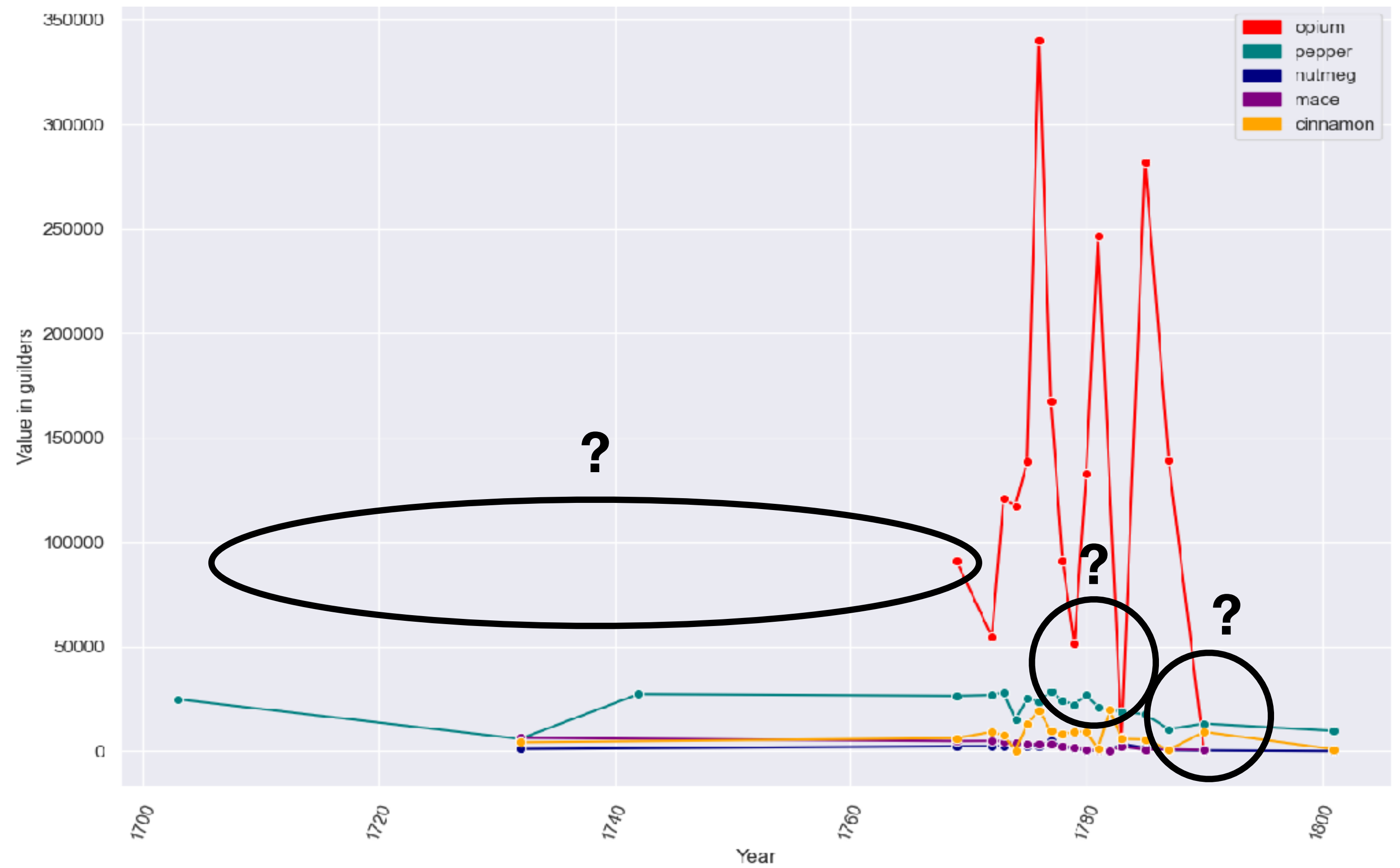
- the value of opium was very unstable during 1769-1787
- why unstable?
- data gaps



Average value of a commodity per year according to BKB

# Hypotheses

- Not all values are declared in the cargo logs, sometimes commodities are grouped
- In 1746 the Amphioen Society was founded by VOC directors to combat smuggling by employees
- Other colonial powers were also heavily interested in opium (e.g. Opium Wars)



Average value of a commodity per year according to BKB



# To be continued

- Include more synonyms
  - Globalise project Commodities thesaurus
- Explicit modelling of change
- Trace commodities in additional data sources



A Market Stall in Batavia, attributed to Albert Eckhout, c. 1640 – c. 1666. [Rijksmuseum](#), CC0.



# Dealing with Colonial Language





# Changing World Views & Language

- Our language reflects our world views
- Many archives contain language that does not longer correspond to current societal values
- How can we deal with this?

Andrei Nesterov, Laura Hollink, Marieke van Erp, and Jacco van Ossenbruggen. "A Knowledge Graph of Contentious Terminology for Inclusive Representation of Cultural Heritage." In *European Semantic Web Conference*, pp. 502-519. Cham: Springer Nature Switzerland, 2023.

Ryan Brate, Marieke Van Erp, and Antal Van den Bosch. 2023. Contextual Profiling of Charged Terms in Historical Newspapers. In *Proceedings of the 4th Conference on Language, Data and Knowledge*, pages 97–108, Vienna, Austria.

Ryan Brate, Marieke van Erp, and Antal van den Bosch. "A Bayesian Quantification of Aporophobia and the Aggravating Effect of Low–Wealth Contexts on Stigmatization." In *The 8th Workshop on Online Abuse and Harms (WOAH)*, p. 234. 2024.



Image source: [https://en.wikipedia.org/wiki/The\\_Tower\\_of\\_Babel\\_%28Bruegel%29#/media/File:Pieter\\_Bruegel\\_the\\_Elder\\_-\\_The\\_Tower\\_of\\_Babel\\_\(Vienna\)\\_-\\_Google\\_Art\\_Project\\_-\\_edited.jpg](https://en.wikipedia.org/wiki/The_Tower_of_Babel_%28Bruegel%29#/media/File:Pieter_Bruegel_the_Elder_-_The_Tower_of_Babel_(Vienna)_-_Google_Art_Project_-_edited.jpg)



# Disclaimer

Some slides in this presentation and the corresponding publications contain derogatory (Dutch) words and phrases. They are provided solely as illustrations of the research topic and results and do not reflect the opinions of the authors or their organisations.



# Contextual Profiling of Charged Terms

# Words Matter

An Unfinished Guide  
to Word Choices  
in the Cultural Sector

## GLOSSARY OF TERMS

### Exotic

#### HISTORY, USE & POSSIBLE SENSITIVITIES

This term is derived from the Ancient Greek word “*exōtíkos*,” literally meaning “from the outside.” It entered the Dutch language with the meaning of foreign/alien, which it still has today. The term has become intertwined with ideas about the (racialized and sexualized) Other.

The term “exotic” is commonly used to describe plants and animals, but is also used for people (usually people of color), where it has a connotation of being different from the norm, especially in reference to appearance and name (for example “what an exotic name!”). Sometimes it has a sensual connotation.

#### SUGGESTIONS

- Applicable when referring to plant and animal species. It is, however, contested to use the term to describe people.

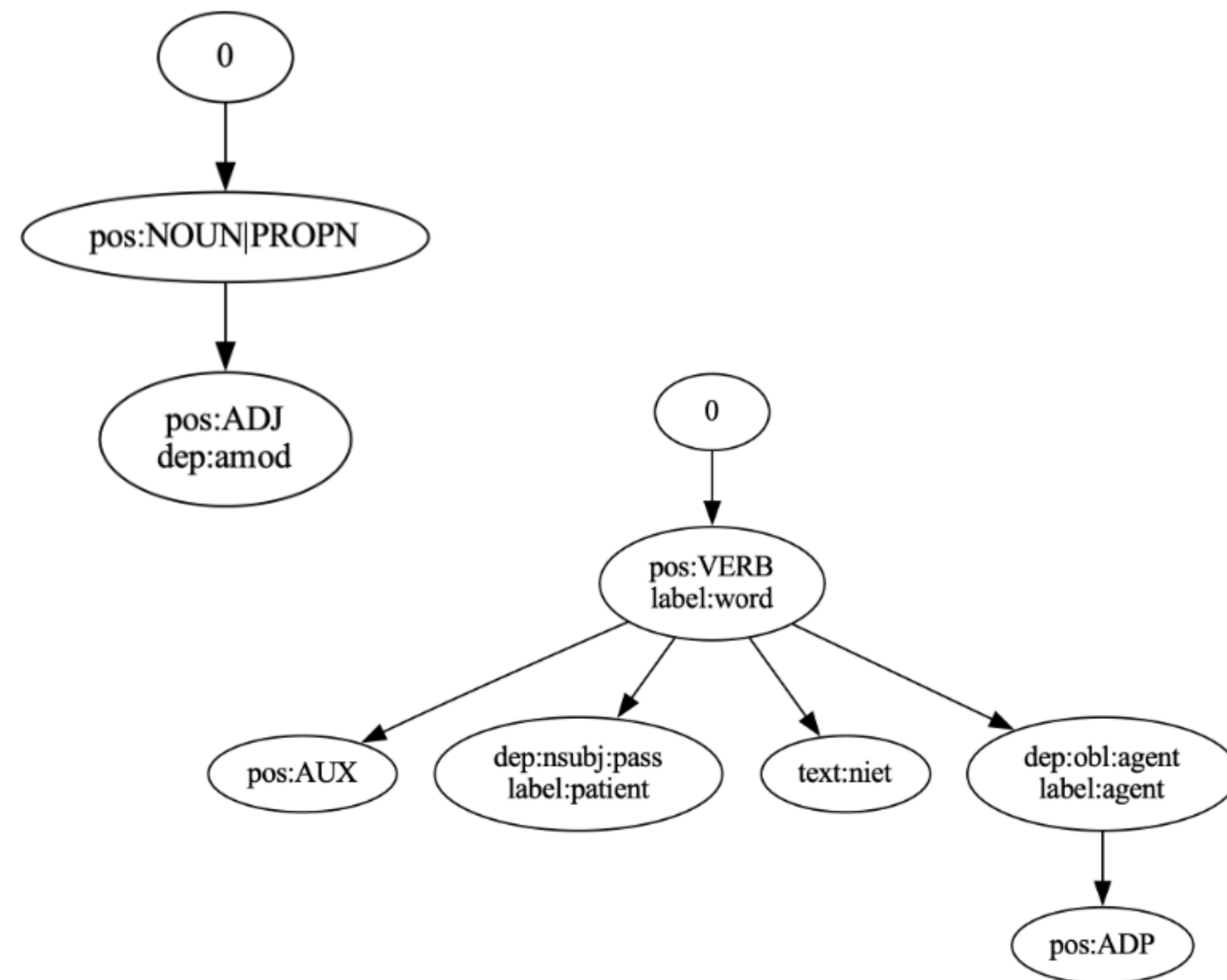


# Research Questions

1. Do contextual features exist, which for known-charged collective nouns are highly predictive of the noun?
2. Are there highly predictive context features which have known-charged collective nouns in common?
3. Can the context features of known charged nouns help identify lesser-known charged instances?

# Contextual Profiling of Charged Terms

- Dutch newspapers 1950 - 1990
- ~12M articles
- Model contexts known charged nouns
- Use contexts to identify other, previously unknown, charged contexts
- POS-tag patterns, scored via log-likelihood ratio





# Methodology: Contextual Features

The things they do the things done to them and the way they are described

# Methodology: Contextual Features

The things they do the things done to them and the way they are described

Bob hit little Alice on the head

↓  
(Bob, hit, agent)

↘  
(Alice, little, adj)  
(Alice, hit, patient)



# Methodology: Feature Extraction - Verbs

## Cascading Verb match in corresponding English

- ↳ Alice was not hit by bob (Neg, Verb, Aux, obj-Agent, subj-Patient, Prep)
- ↳ Alice was hit by bob (Verb, Aux, obj-Agent, subj-Patient, Prep)
- ↳ Bob has hit no one (Neg1, Verb, Aux, subj-Agent, obj-Patient)
- ↳ Bob has not hit Alice (Neg1, Verb, Aux, subj-Agent, obj-Patient)
- ↳ Bob has hit Alice (Verb, Aux, subj-Agent, obj-Patient)
- ↳ Alice was not hit (Neg, Verb, Aux, subj-Patient)
- ↳ Bob didn't hit Alice (Neg, Verb, subj-Agent, obj-Patient))
- ↳ Alice was hit (Verb, Aux, subj-Patient)
- ↳ Bob hit Alice (Verb, subj-Agent, obj-Patient)
- ↳ Bob didn't hit (Neg, Verb, subj-Agent)
- ↳ Bob hit (Verb, subj-Agent)

# Methodology: Feature Extraction

## Compound word modifiers

for each noun *{charged noun}* identify modifiers  
*{modifiers}*

for each modifier in *{modifiers}* identify nouns  
*modifier-noun instances & frequencies*



## Evaluation and Results: Is the pattern matching good?

Are the (noun, context) extracts good?

| Pattern            | Accuracy point estimate | Accuracy 95% Confidence Interval (Wilson) |
|--------------------|-------------------------|---|
| Adjective Patterns |                         |   |
| A1                 | 97% (125)               | 92 - 99 %                                 |
| Verb Patterns      |                         |   |
| V1                 | 95% (66)                | 87 - 98 %                                 |
| V2                 | 91% (125)               | 85 - 95 %                                 |
| V3                 | 94% (125)               | 89 - 97 %                                 |
| V4                 | 88% (125)               | 81 - 93 %                                 |

Point est. > 90%

#OCRErrorsALittleNoiselsOK #DepParseErrors

# Evaluation and Results:

Harvested data: *(noun, feature + role) + corresponding frequencies*

Associativity scoring method: *Dunning's Log Likelihood Ratio*

#Dunning #ChiSquaredAnalogous #NonNormal #ZipfianTailSafe



# Evaluation and Results: RQ1

Do contextual features exist, which for known-charged collective nouns are highly predictive of the noun?

# Evaluation and Results: RQ1

## Modifiers in compounds

**Indian:** amazon ('69), apache ('91), navajo, sioux ... flat-footed ('55, '65), half-blood ('81)

**Migrant:** aspirational ('51), 2nd-generation (95')

...  
**Baboe:** *caring* ('79)

**N-word:** bantu ('55), congo ('55), gold coast ('55) ... wood ('55, '75, '89)

## Adjectives

Immigrant synonym (***Allochtoon***): out of work ('89), willing to work ('91)

**Islamist:** fundamentalist ('81)

#RepresentedAsEnglishTranslation #ExpectedOutcomes #NotOurOpinion



# Evaluation and Results: RQ1

## Verbs for this the noun is the agent

**Immigrant:** smuggling in ('71) , complain ('51), flooding in ('89), stab to death ('95)

**N-word:** looting ('69)

## Verbs for which the noun is the patient

**Immigrant:** admitted ('51), housed ('91), classified ('79)

**Coloured:** integrated ('75)

**N-word:** executed ('51), shot ('65), lynched ('51, '59), loathed ('69), massacred ('69), repressed ('65), blended ('61), fled ('81), robbed ('79), beaten up ('65)

## Evaluation and Results: RQ2

**Are there highly predictive context features which have known-charged collective nouns in common?**



## Evaluation and Results: RQ2

*E.g.,*

**Coloureds, immigrants and gypsies** are ... *deported*

**Immigrants** in '75 and '95 ... *flooding in*

**tribe** is synonymous with ... **primitive**  
( '51, '59, '65, '69, '71, '75, '79, '81, '85, '89, '95)

# Evaluation and Results: RQ3

Can the context features of known charged nouns help identify lesser-known charged instances

#NoGoldStandard



# Evaluation and Results: RQ3

“Jews”

**Coloureds, immigrants, gypsies** - to be *deported* ,  
**islamists** - *orthodox*,  
**Gypsies** - *stateless*,  
**Tribe** - to be *massacred*,  
**N-word** - to be *lynched*

#ThrowsUpQuestions

# Evaluation and Results: RQ3

“Communists”:

**barbarians** - *bloodthirsty* ,  
**dwarf** - *bloodthirsty*,  
[American] **indians** - *they massacre*,

#ThrowsUpQuestions

#SameCutoffAsRQ2



# Future Work and Open Questions

Consider other domains, English vs Dutch

Explore the metadata: are the profiles constant across metadata features?

Consider a less arbitrary, more nuanced examination of (noun, feature) affinity scores.

Consider other reference points ... e.g., associated with dehumanization or infantilization.

Bridge from token level examination to topics or themes

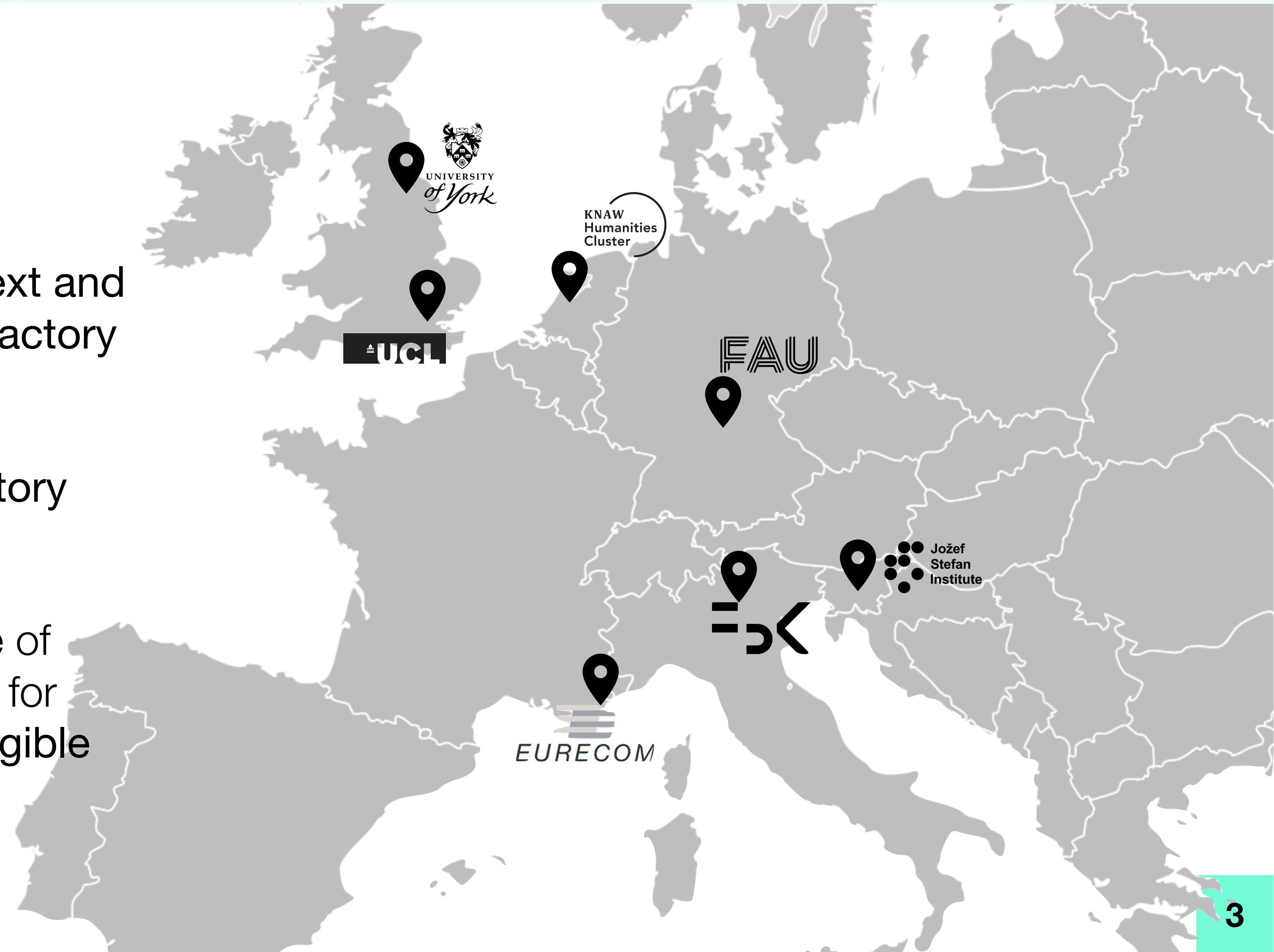
# The History and Heritage of Smell



# The Project Team

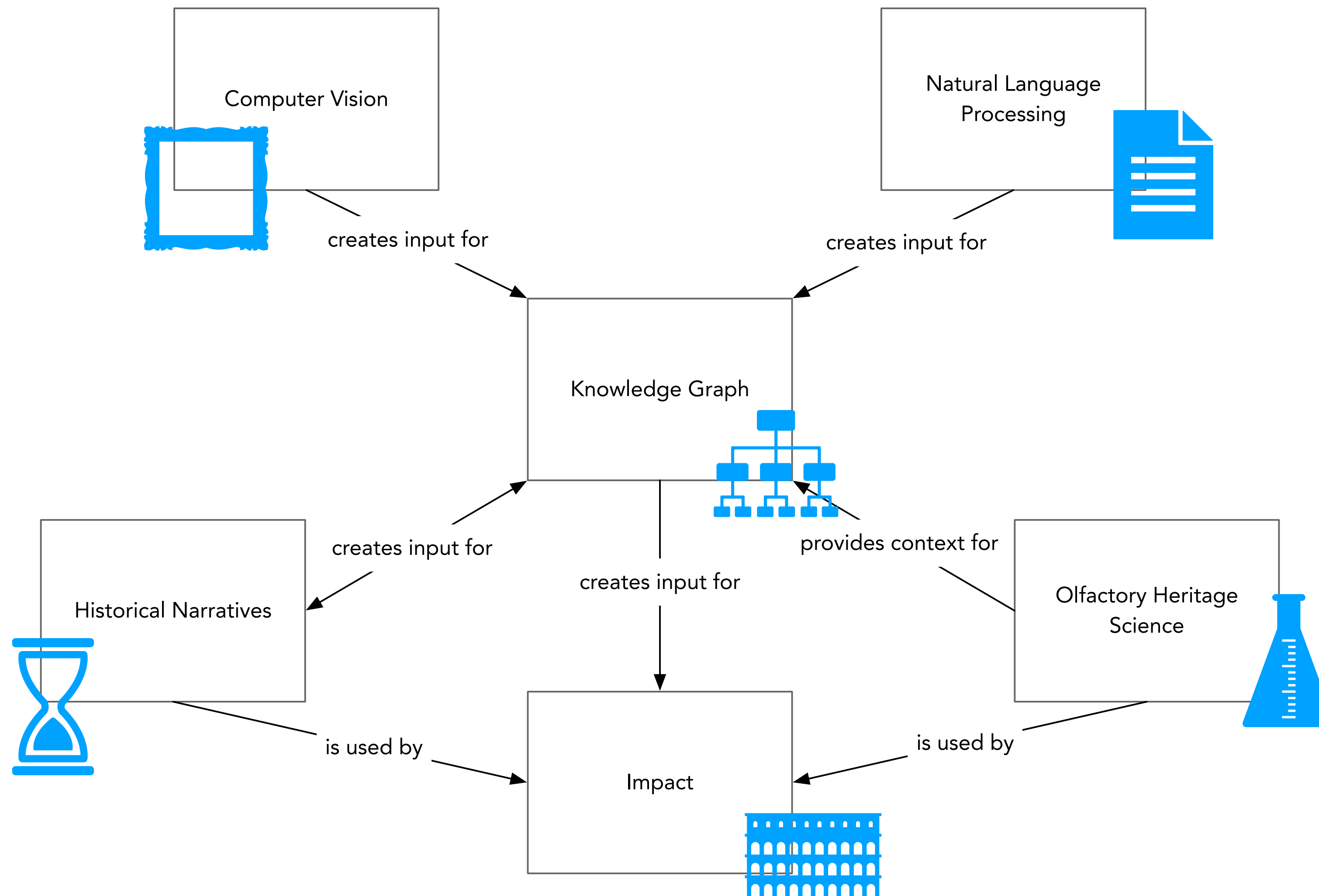
## Objectives:

- develop state-of-the-art AI techniques to identify olfactory information in digital text and image collections; to curate historical olfactory narratives;
- recognise, safeguard, and promote olfactory heritage;
- to show that critically engaging our sense of smell & olfactory heritage is viable means for connecting and promoting Europe's tangible and intangible cultural heritage

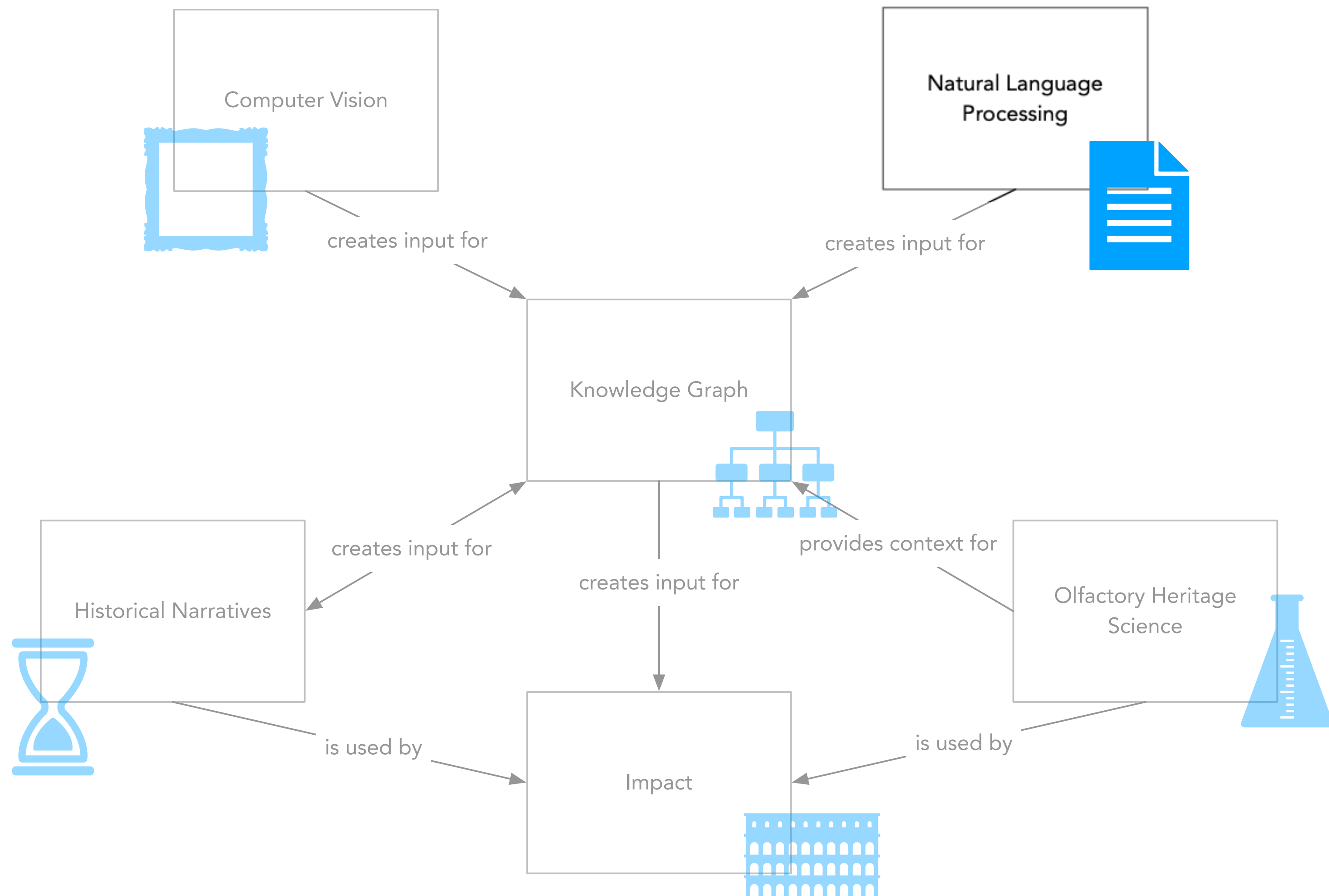




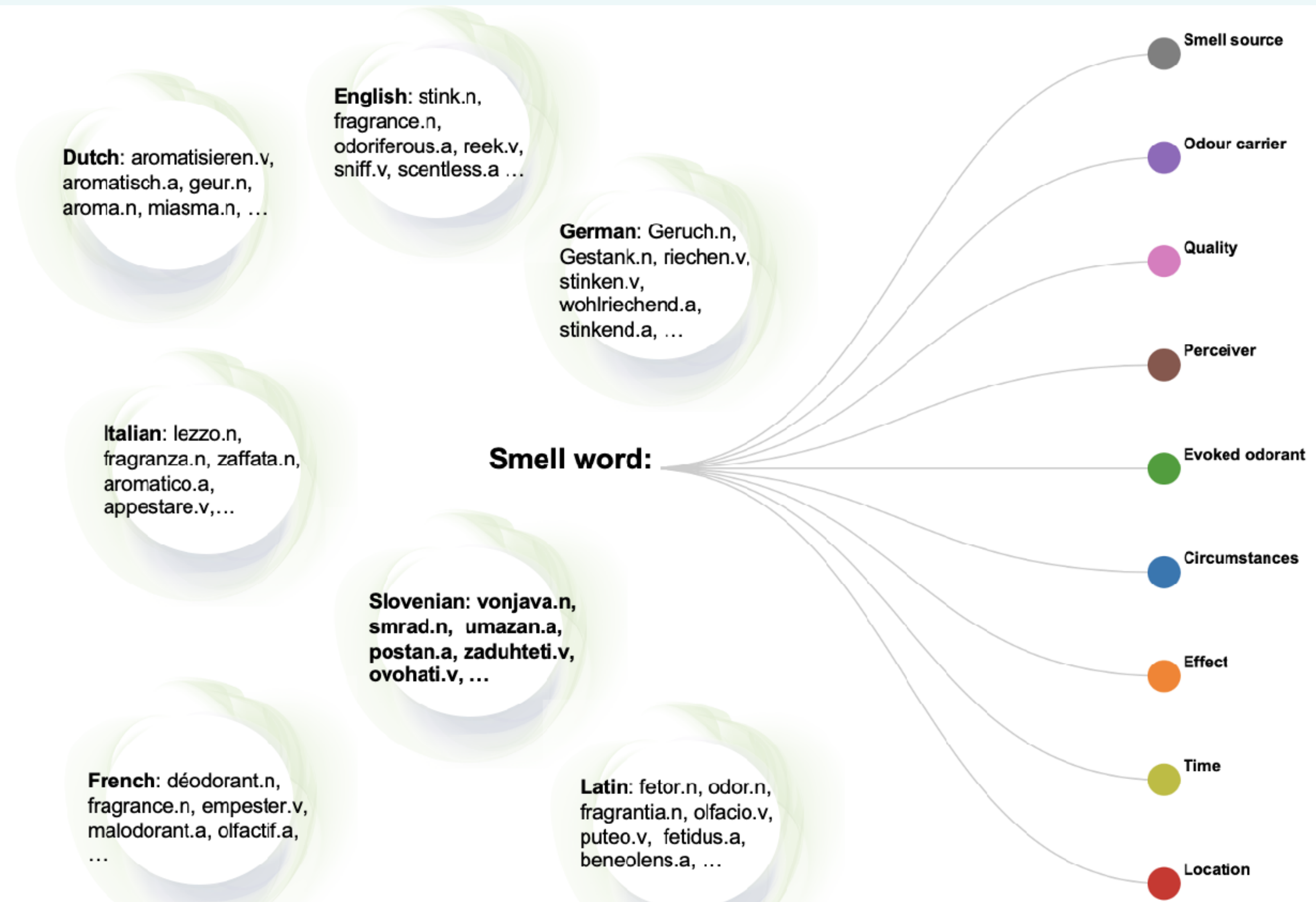
# Super interdisciplinary



# Reading Smell



# Extracting Olfactory References from Text





# Reading Smell

- Objective: developing language technology to identify references to smells in (historical) texts;
- Challenges:
  - finding smell references;
  - language change.
- Annotation guidelines, benchmark dataset for English, Italian, French, Dutch, German, Slovene & Neo-Latin
- Stefano Menini, Teresa Paccosi, Sara Tonelli, Marieke Van Erp, Inger Leemans, Pasquale Lisena, Raphael Troncy, William Tullett, Ali Hürriyetoğlu, Ger Dijkstra, Femke Gordijn, Elias Jürgens, Josephine Koopman, Aron Ouwerkerk, Sanne Steen, Inna Novalija, Janez Brank, Dunja Mladenec, and Anja Zidar. 2022. A multilingual benchmark to capture olfactory situations over time. In Proceedings of the 3rd Workshop on Computational Approaches to Historical Language Change, pages 1–10, Dublin, Ireland. Association for Computational Linguistics

The screenshot displays a text editor window titled "satonelli: Odeuropa Benchmark EN/021E Thomas Tomkis 1607 Lingua or the battle of the senses\_\_26\_THE.txt" with a progress indicator "1-25 / 61 sentences [doc 21 / 84]". The text is annotated with various semantic relations:

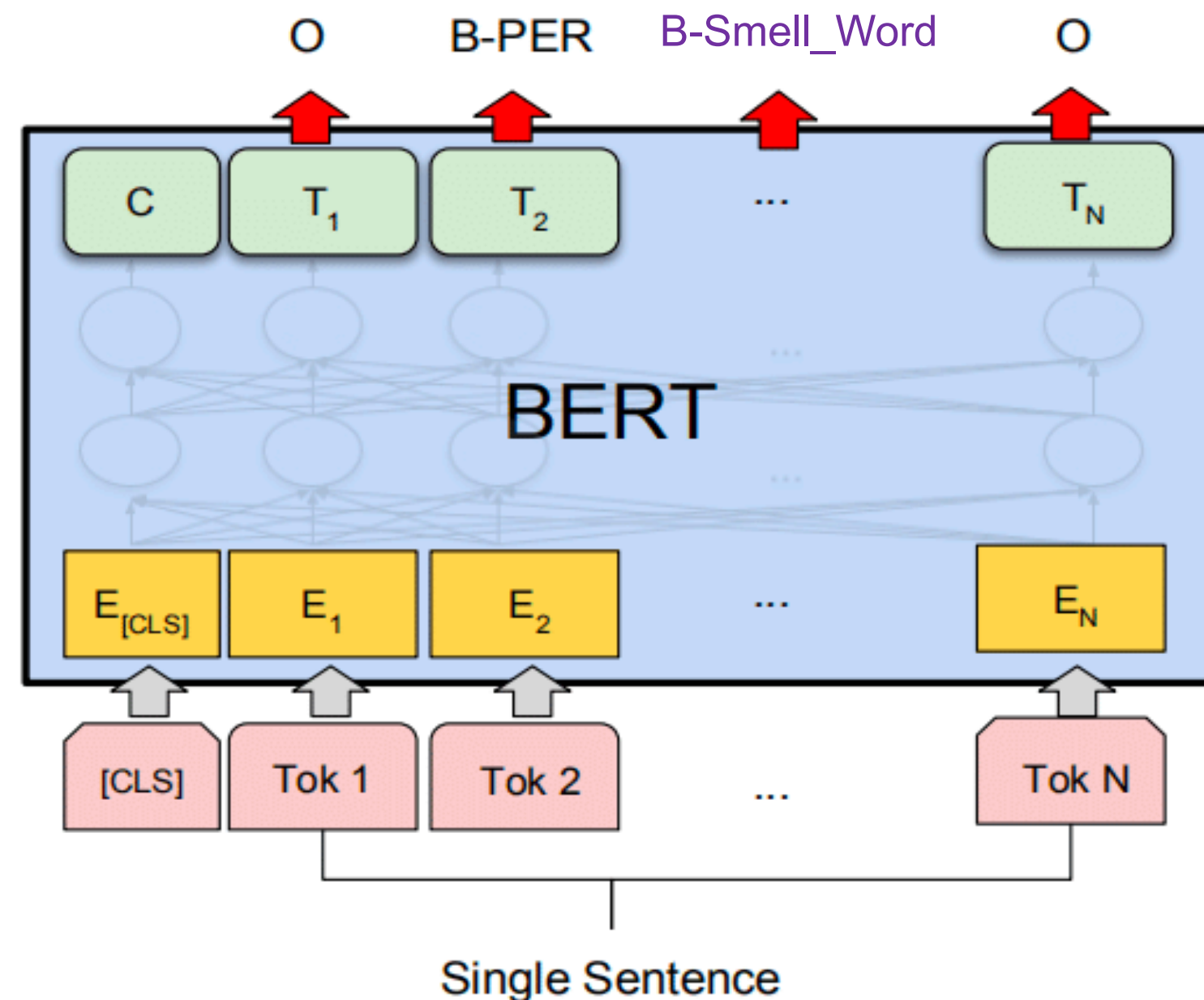
- Line 16:** "ODOR ." with a "Smell\_Word" label above it.
- Line 17:** "I do my Lord, and haue at my command, The smell of flowers , and Odoriferous drugs,". Relations include "Perceiver" (I), "Smell\_Word" (smell), "Smell\_Source" (of flowers), and "Smell\_Source" (Odoriferous drugs).
- Line 18:** "Of oyntments sweete, and excellent perfumes, And Court-like waters, which if once you smell ,". Relations include "Smell\_Source" (Of oyntments sweete, and excellent perfumes, And Court-like waters), "Time" (which if once), "Perceiver" (you), and "Smell\_Word" (smell).
- Line 19:** "You in your heart would wish as I suppose: That all your Body were transformed to Nose." with an "Effect" relation.
- Line 20:** "PHA." with a "Smell\_Word" label above it.
- Line 21:** "Olfactus of all the Senses, your obiects haue the worst luck, they are alwaies iarring with their contraries, for none can weare Ciuet , but they are suspected of a proper badde sent , where the prouerbe springs, hee smelleth best , that doth of nothing smell .". Relations include "Smell\_Word" (Olfactus), "Smell\_Source" (of all the Senses), "Quality" (Ciuet), "Smell\_Word" (sent), "Odour\_Carrier" (hee), "Smell\_Word" (smelleth), "Quality" (best), "Smell\_Source" (that doth of), and "Smell\_Word" (nothing smell).
- Line 22:** "ACT. 4. SCENA 4. The bench and Olfactus as before, Tobacco apparelled in a taffata mantle, his armes browne and naked, buskins made of the pilling of Osiers, his necke bare, hung with Indian leanes, his face browne painted with blew stripes, in his nose swines teeth, on his head a painted wicker crowne, with Tobacco pipes set in it, •lumes of Tobacco leaues, lead by two Indian boyes naked, with tapers in their hands, Tobacco boxes and pipes lighted." with "Smell\_Word" labels above "Tobacco" and "Tobacco pipes".
- Line 23:** "PHA." with a "Smell\_Word" label above it.
- Line 24:** "Foh, foh, what a smell is heare?" with "Smell\_Word" labels above "smell" and "heare".
- Line 25:** "is this one of your delightfull obiects?" with a "Smell\_Source" relation above "one of your".

# How does AI Read Smells?

Le    parfum            des            fleurs            est    souvent    écoeurant

↓            ↓            ↓            ↓            ↓            ↓            ↓

O    B-Smell\_Word    B-Smell\_Source    I-Smell\_Source    O            O            Quality

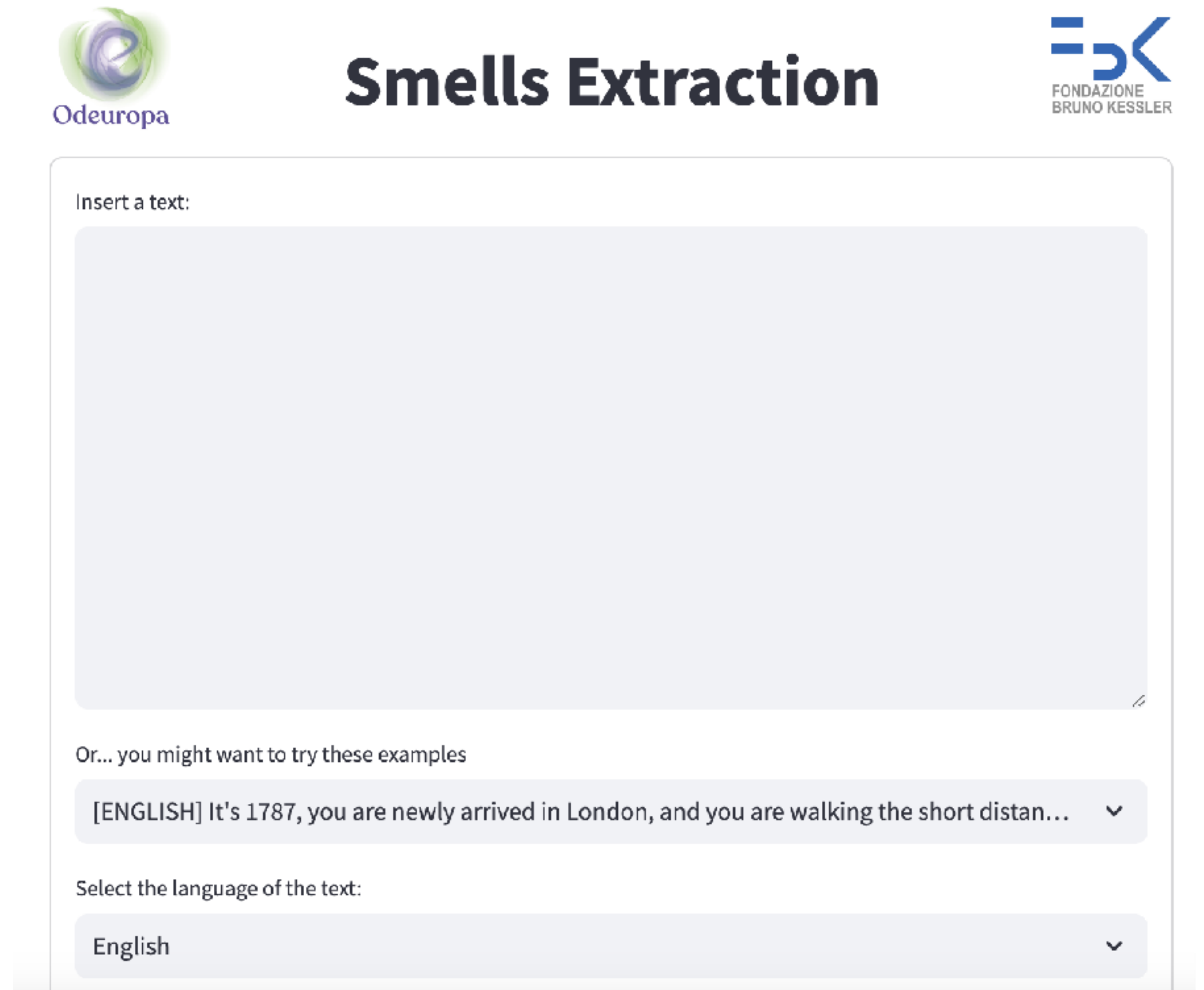


Sentences are split up into tokens (words)

The system classifies each word according to the categories: smell word, smell source, quality, perceiver, location, time etc.

# Try it yourself!

- <https://smell-extractor.tools.eurecom.fr/>
- Copy or type a text
- Select a language & go!



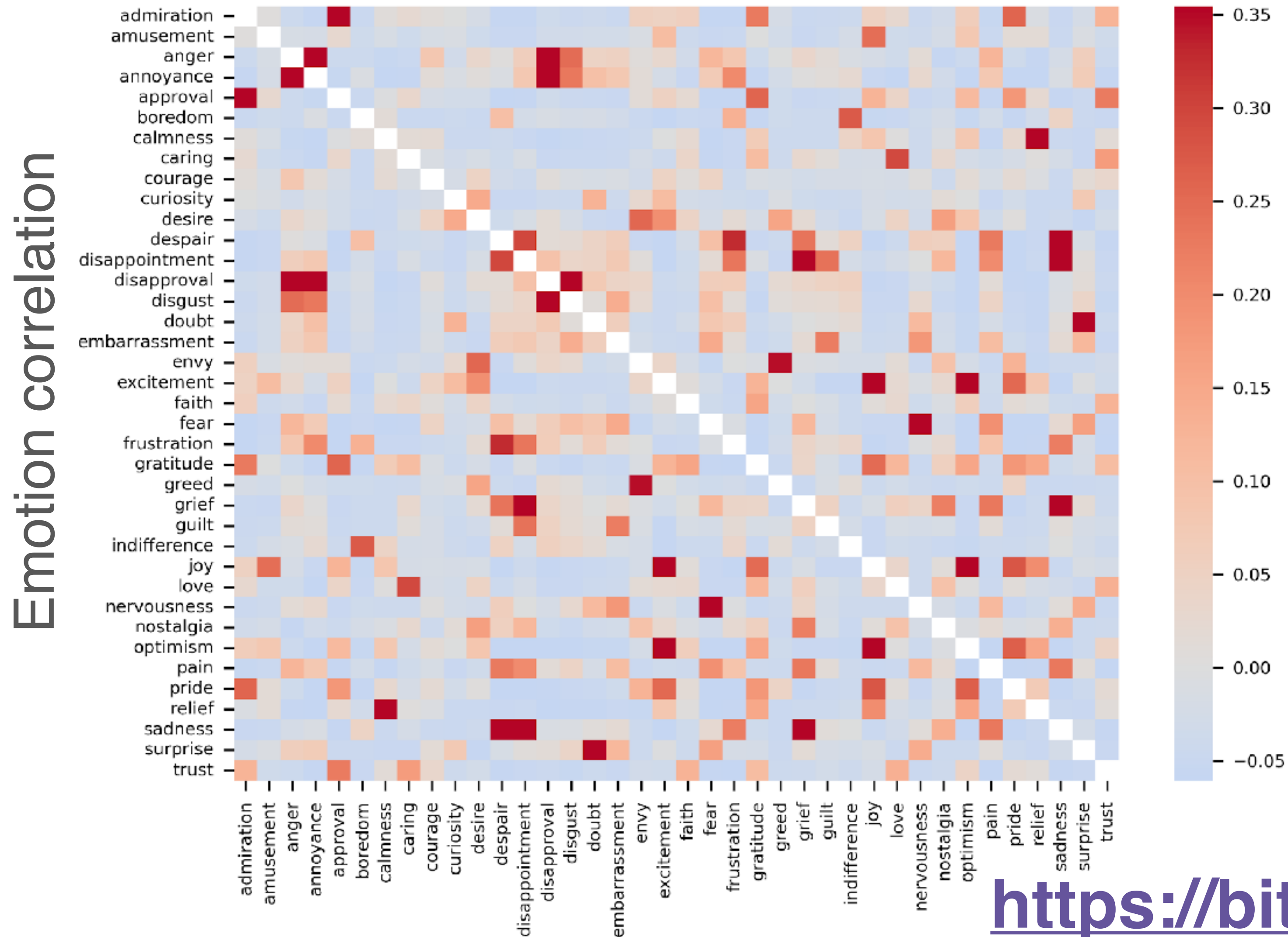
The screenshot shows the 'Smells Extraction' web application interface. At the top left is the 'Odeuropa' logo, and at the top right is the 'FONDAZIONE BRUNO KESSLER' logo. The main heading is 'Smells Extraction'. Below the heading is a large text input area labeled 'Insert a text:'. Underneath this is a section titled 'Or... you might want to try these examples' with a dropdown menu showing '[ENGLISH] It's 1787, you are newly arrived in London, and you are walking the short distan...'. At the bottom, there is a section labeled 'Select the language of the text:' with a dropdown menu showing 'English'.



## ...the Result

[ ENGLISH ] It ' s 1787 , you are newly arrived in London , and you are walking the short distance from the Saracen ' s Head Inn to the nearby Newgate prison . **As you pass** | Circumstances **the Old Bailey courthouse** | Location **you** | Perceiver catch a **terrible** | Quality **smell** | Smell Word **in the air** | Odour Carrier . Uncertain of its origins , you ask a lawyer as they hurry past on their way to a trial . They tell you that the **smell** | Smell Word arose **from the burning** | Circumstances **of a woman who had been found guilty of coining farthings** | Smell Source . The public burning of women in England only ended in 1790 , Catherine Hayes being the last such individual to be thus punished . Up until 1789 | Time the **scent** | Smell Word **of burnt flesh** | Smell Source also appeared **in the courtroom itself** | Location , where **some malefactors** | Perceiver might be branded with a hot iron - " T " for theft , " F " for felon , or " M " for murder . The **smell** | Smell Word **of burning** | Smell Source was a warning to others | Effect . But **smell** | Smell Word could also feature as part of the humiliation of legal or , in some cases , extra - judicial punishment | Effect .

# How well can the AI detect emotions?



- The model achieves a 60% F1 score
- ... but people also don't always agree on an emotion mentioned in a text

<https://bit.ly/Odeuropa-Emotions>



# Sources associated with emotions change over time

## Nostalgia

| 1600-1699  | 1700-1799   | 1800-1899   | 1900-1930   |
|--|---|---|---|
| brimstone, eglantine, garlands of <b>roses</b> , of sin, pink epitheton, pollution, sops - in - wine | garden, <b>a bank of violets</b> , a country full of new - mown hay, banks of blueberries, <b>blossoms</b> , boeotian, cold, fountains, greens, hay | <b>flowers, roses, blossoms</b> , clover, tea, shrubs, <b>violets</b> , air, <b>herbs</b> , incense | <b>flowers, of roses</b> , incense, pine, <b>blossoms</b> , of her hair, of lavender, of the sea, <b>of violets, of orange blossoms</b> |

## Fear

| 1600-1699   | 1700-1799                                     | 1800-1899  | 1900-1930   |
|---|---|--|---|
| creatures, fishes, flowers, fruits, gums, plants, seeds, serpents | fluid, <b>of blood and gun - powder</b> , oil | <b>of blood, a rat</b> , danger, of smoke, of sulphur, fire, of <b>gunpowder</b> , of musk, aromatics, brimstone | <b>a rat</b> , trouble, <b>blood</b> , danger, of smoke, salts, of brimstone, death flowers, flying |



# “Follow you nose” Exhibition at Ulm Museum

**Title:** Portrait of Helena Schermar

**Date:** c.1620

**Creator:** Andreas Schuch (c.1634–1680)

**Medium:** Oil on canvas





upon it, with discretion too muche nor too little of sope makers lie, the first, best, and strongest of three sortes that they vse, called the maister lie, and keepe the saied grease in the heate of the sunne, mixing it well there, and likewise in the night abroad in the aire: but take heede that there come no water to it, When you see that it is somewhat drie, put to it againe as muche as shall neede of the seconde and thirde lie mixed together, whiche sope makers vse: rub a little upon your hande being cleane, and if it make a froth, it is a token it is made.

Parfume for a Lanipe.

Take Ligni Aloes a quarter, Bengewine an ounce, Storax calamita halfe an ounce, Muske a scruple, amber grise halfe a scruple, rose water enough. You shall put all these things well beaten to powder into the Lampe.

A shorte perfume.

Take a glasse full of rosewater, cloves well beaten in powder, a penny waight: then take the fire panne, and make it red hot in the fire, and put therein of the saied rosewater with the saied powder of cloves, making it to consume by little and little, but the rosewater must be muskat and so you shall make a perfume of excellent good odour.

An odoriferous Perfume for Chambers.

Take Thymiana a pounce, Storax Liquida two ounces, Storax calamita three ounces, Labdanum an ounce, coales of willowe and Tracagantum as much as you will: but steepe or temper the powder of the coales, and the Tracagantum with rosewater, and then make thereof paste.

A very good perfume for to trimme gloues with little cost, and yet will continue longe.

First let the Gloues be greate, and of good thicke leather, to the whiche you shall giue a little ciuet all along the seames:

Then wash them in rose water twice or thrise, pressing them hard: this done, take two parts of rosewater, one part of water of the blossomes of Myrtle tree, mingle them together: adding to it two partes of water of the flowers of Oranges, Lemons, and Citrons, called of the Frenchmen, Eau de Naphe, and wash them so long therewith, that they saour no more of the Leather: then laie them in a platter and leaue them there couered with the saide water, and poudered ouer with the powder of Cypres by the space of a daie or twaine. This done, take them out and presse them a little, and so drie them in the shadowe. When they be halfe drie, giue them a little Ciuet, as you shall thinke good in a dish, with a little oyle of Iasemine, that is not olde, the whiche you shall make to dissolve before the fire, then annointe therewith the gloues within side, and rub them well betwene your hands, chafing them at the fire, untill you thinke that the Ciuet be pearced and gone through them, and leaue them so a while. Then after rub them well with a cloth, to the ende that the ciuet may pearce the better, and the gloues wax soft: then draw & stretch them abroad, leauing them so by the space of a daie, and when you shall thinke they be humide and moist, enlarge them and blowe them, and pufte them vpp: Leau them so untill they be halfe dried. Then take good perfume to burne, and holde them ouer the smoke of the saide perfume, to the ende that it may pearce and goe into the inner partes of the gloues, and perfume them within side. This shall you doe thrise a daie the space of twentie daies, weating them at each time with a little perfumed water, and wrapping them with som white linnen clothe: then take muske and Amber, as much as you will, and putte it into a Tinne platter, with oyle of Iasemine or Bengewine, or some other oyle, lette them well dissolve at the fire, with a little perfumed water, then annointe them with a Pensell on the outside, and not within: annointe also the seames with Ciuet, and laie them certaine daies among dried roses. Finally, laie them for the space of three or fouer daies,



First let the gloues bee greate, and of good thicke leather, to the which you shall gyue a little **Ciuet** all alonge the seames: Than washe them in **rose water**, twise or thryse, pressing theym harde: this doen, take twoo partes of **rose water**, one parte of the **water of the blossoms of Mirtell** tree, mingle them together: addinge to it two partes of the **water of the flowres of Orenge, Lemons, & Citrons**, called of the Frēchmen, can de nafe, and washe them so long therwith, that they **sauour no moore of the leather** [...]

Than wil they bee **excellent**, as if it were to present an **emperour** withall.

-- *Girolamo Ruscelli. The Secrets of the Reuerende Maister Alexis of Piemount. 1558*





## Scent Design Brief

*This form is intended to assist museum professionals, historians and scent designers through the scent development process. It should be filled out for each artwork, artefact, text, or space that the scent will be created for.*

### Scope of the Project:

**Exhibition/Guided tour title:** Mit der Nase sieht man mehr. Eine Führung mit Geruch/ Seeing More through Smell: A Scented Guided Tour

**Institution:** Museum Ulm

**Location:** Ulm, Marktpl. 9, 89073 Ulm, Germany

Projected opening date: Soft launch 8–9 November 2021; Press launch: 25–26 January 2022; Public launch 30 January 2022.

**Total number of fragrances:** 10

**Scent distribution method(s):** Blotters, hand fans, and whispis.

**What is the artwork, artefact, text, or space (e.g.) that the scent refers to?**













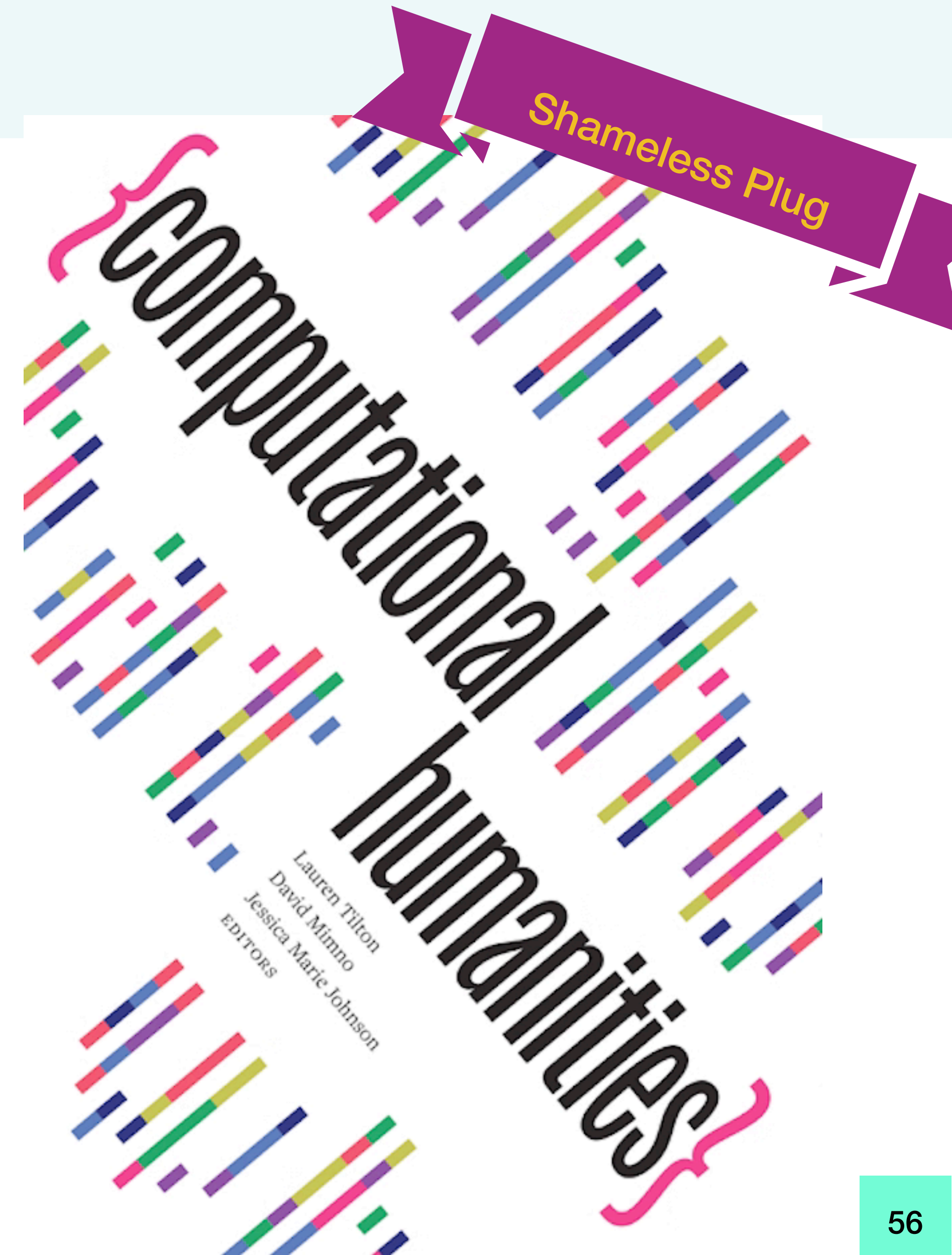
# Time to Smell!





# Wrap-up

- Interdisciplinary projects add complexity, but can also come with great rewards
- Old data: lots of variety, no GDPR issues, no copyright issues
- Digital Editions (TEI/XML), maritime history, reception of literature, migrant history, missing data, Neo-Latin drama, formulaic language in 18th century parliamentary data...
- Challenging problems for technology
- Real-world applications



# Thank you

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## More Information:

<https://dhlab.nl>

<https://cultural-ai.nl>

<https://odeuropa.eu>

<https://mariekevanerp.com>