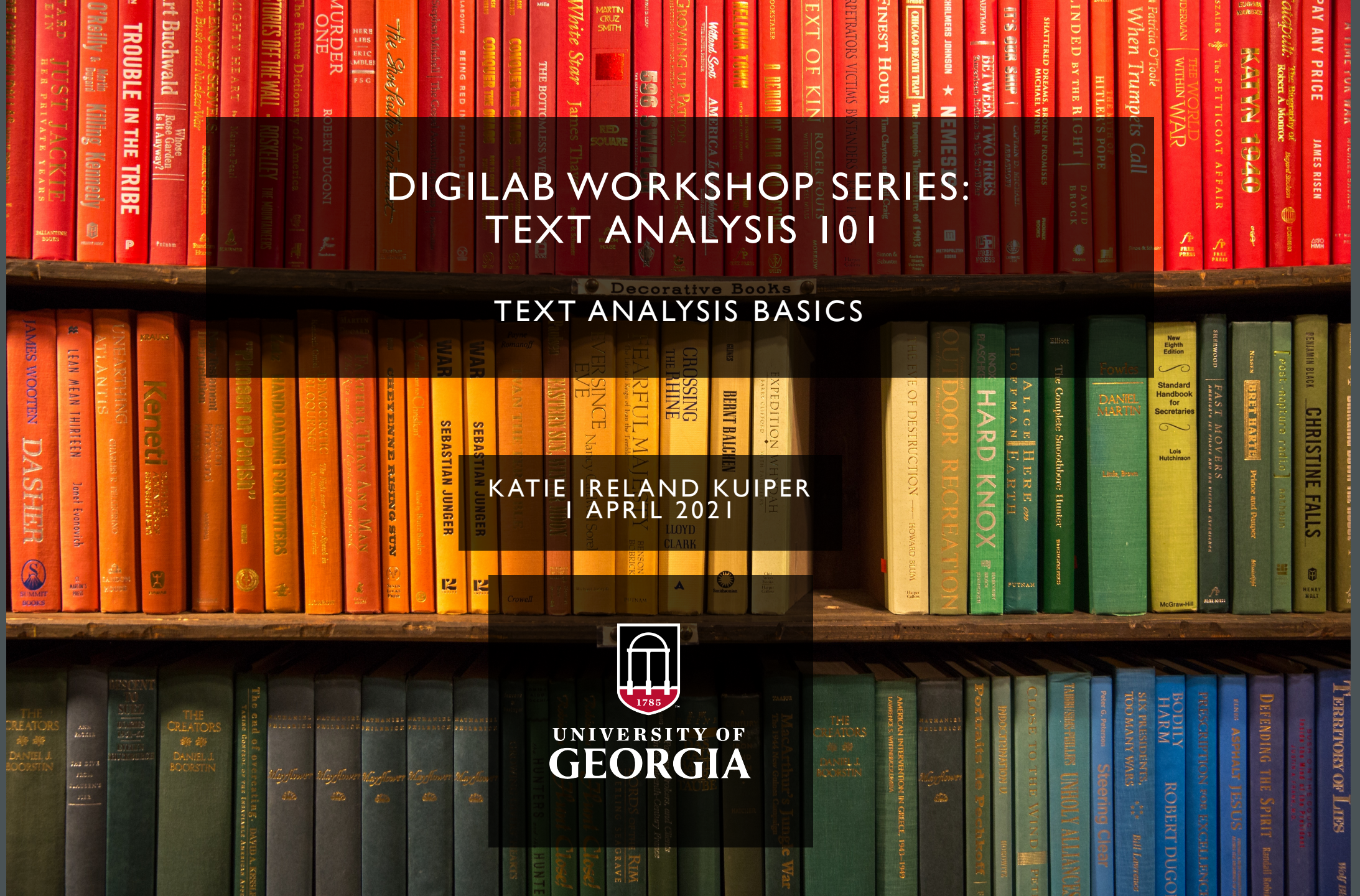

DIGILAB WORKSHOP SERIES: TEXT ANALYSIS 101

TEXT ANALYSIS BASICS

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1 APRIL 2021

UNIVERSITY OF GEORGIA

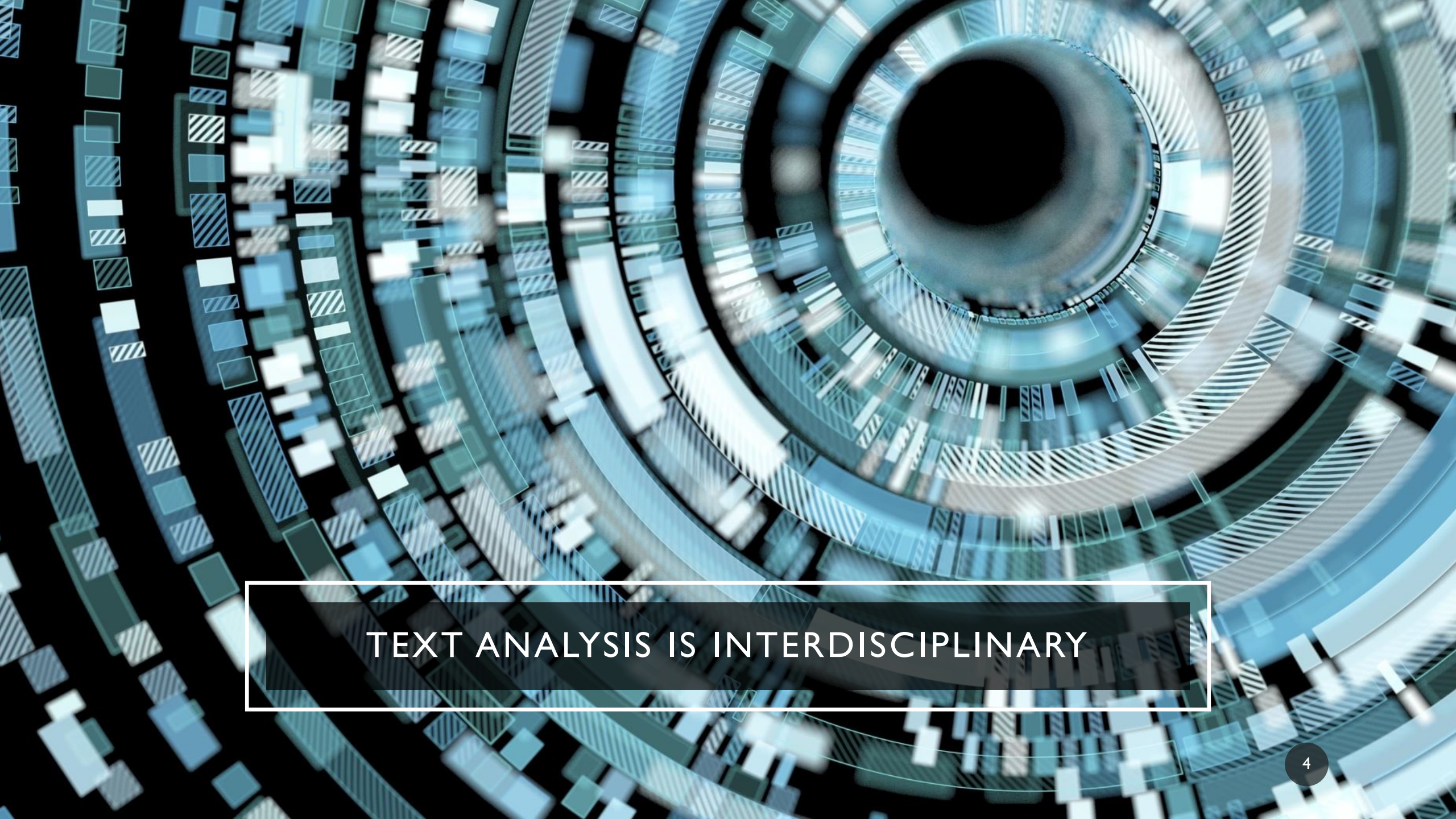
WHAT IS A TEXT?

- any coherent stretch of language (R. Nordquist)
- a piece of written or spoken material in its primary form
- a text is any object that can be 'read' ; a coherent set of signs that transmits a message (Wikipedia)
- the main body of a piece of language
- the written words in a book, on the internet, etc (Cambridge Dictionary)

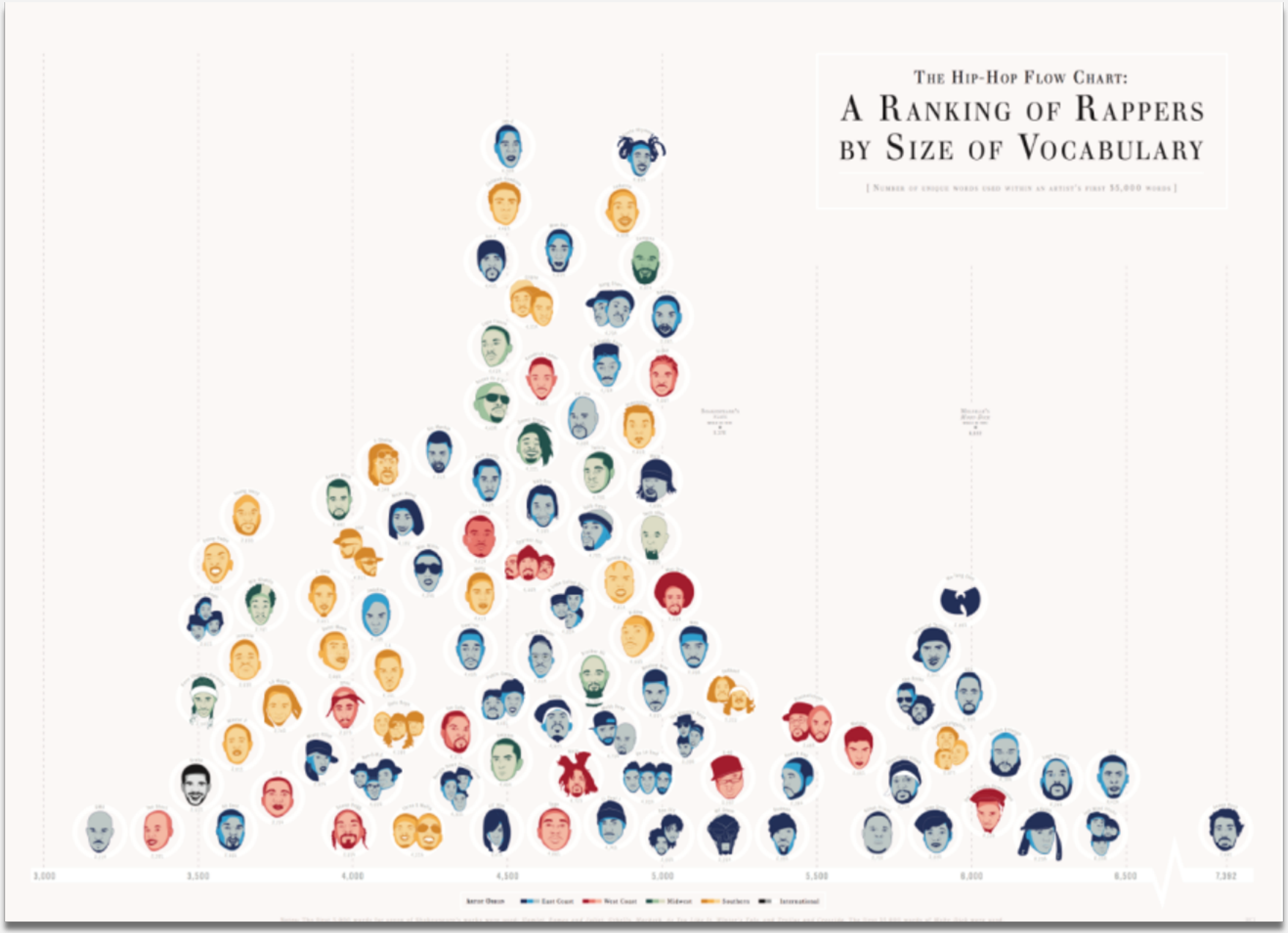
WHAT IS TEXT ANALYSIS?

Encompasses the processes involved in analyzing computerized natural language databases (ie. Corpora) in order to:

- Organize/reformat
- Describe
- Understand
- Investigate linguistic and rhetorical devices
- Study specific genres, contexts, and/or discourses
- Other names: text analytics, text mining, stylistics,



TEXT ANALYSIS IS INTERDISCIPLINARY



http://io9.gizmodo.com/rappers-ranked-by-vocabulary-size-v2-0-1615347822

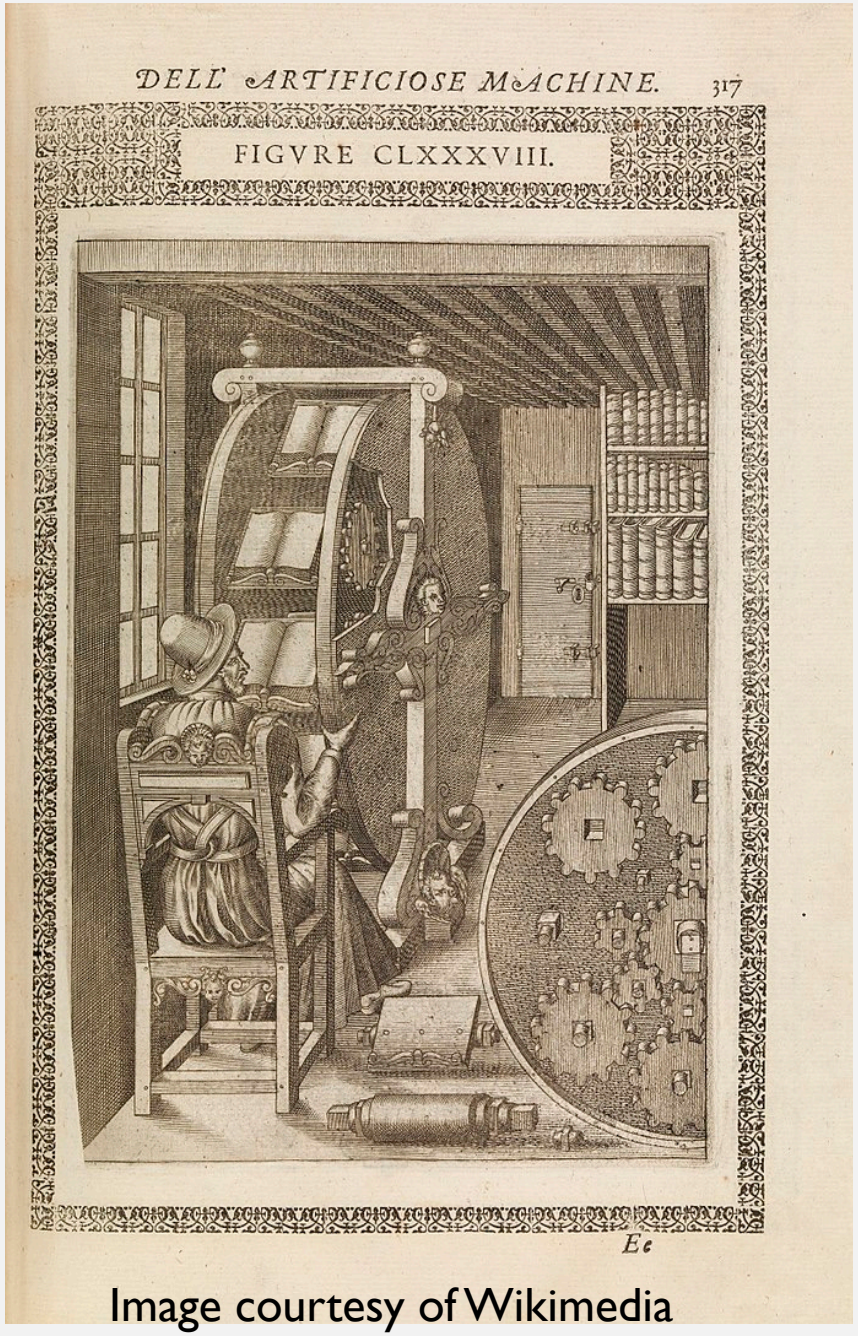
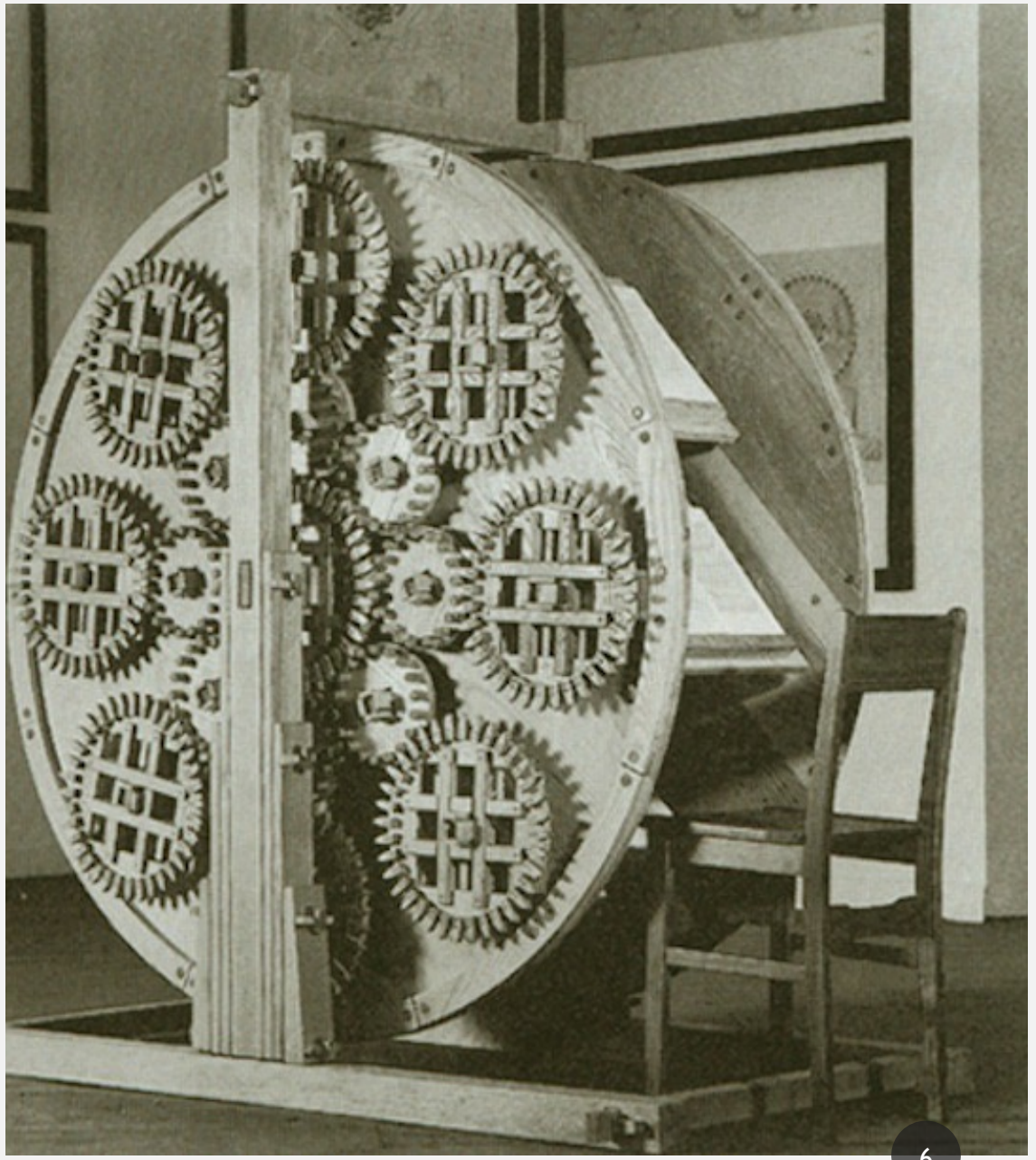


Image courtesy of Wikimedia commons



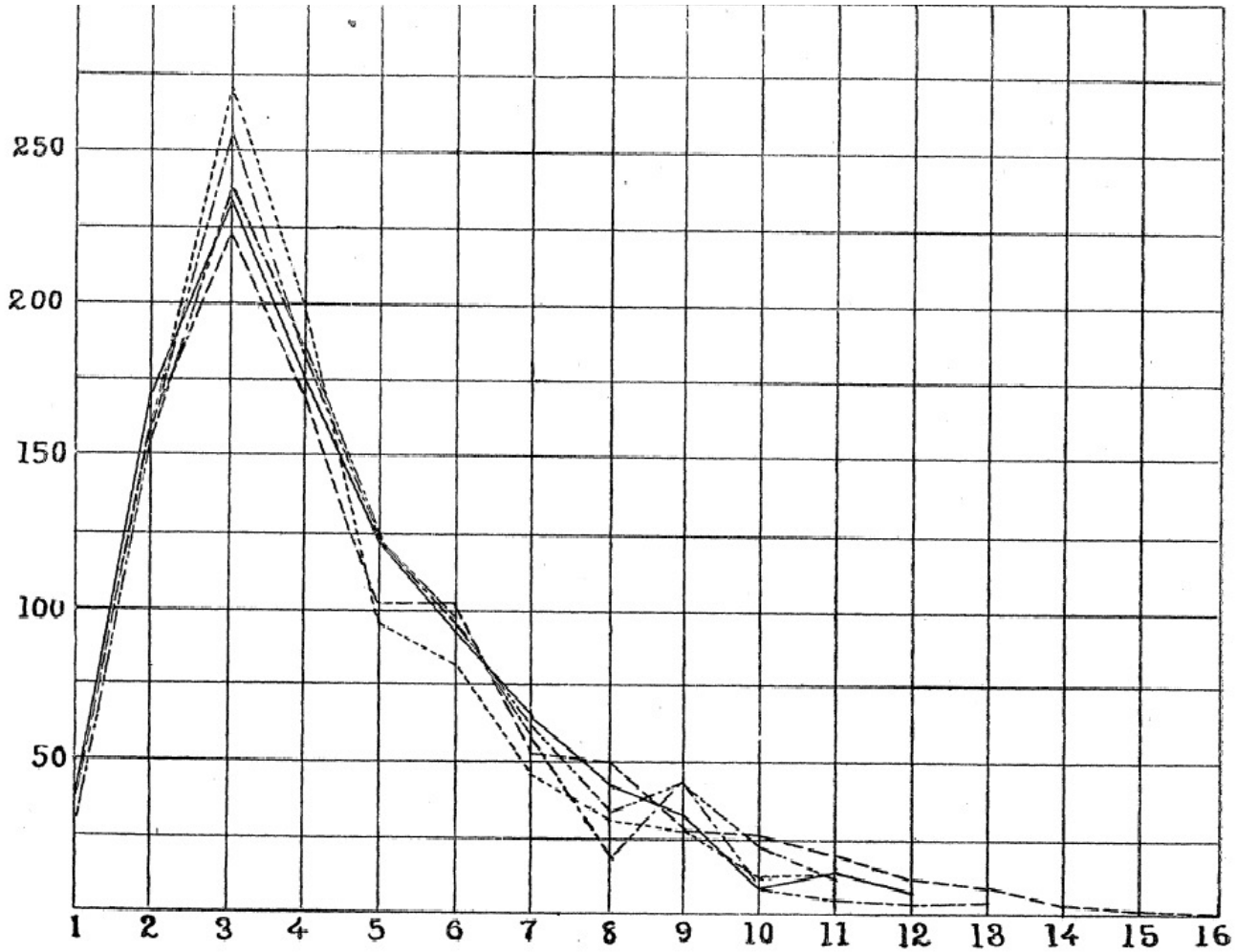


FIG. 2.—SHOWING FIVE GROUPS, OF ONE THOUSAND WORDS EACH, FROM 'OLIVER TWIST.'

SCIENCE.

FRIDAY, MARCH 11, 1887.

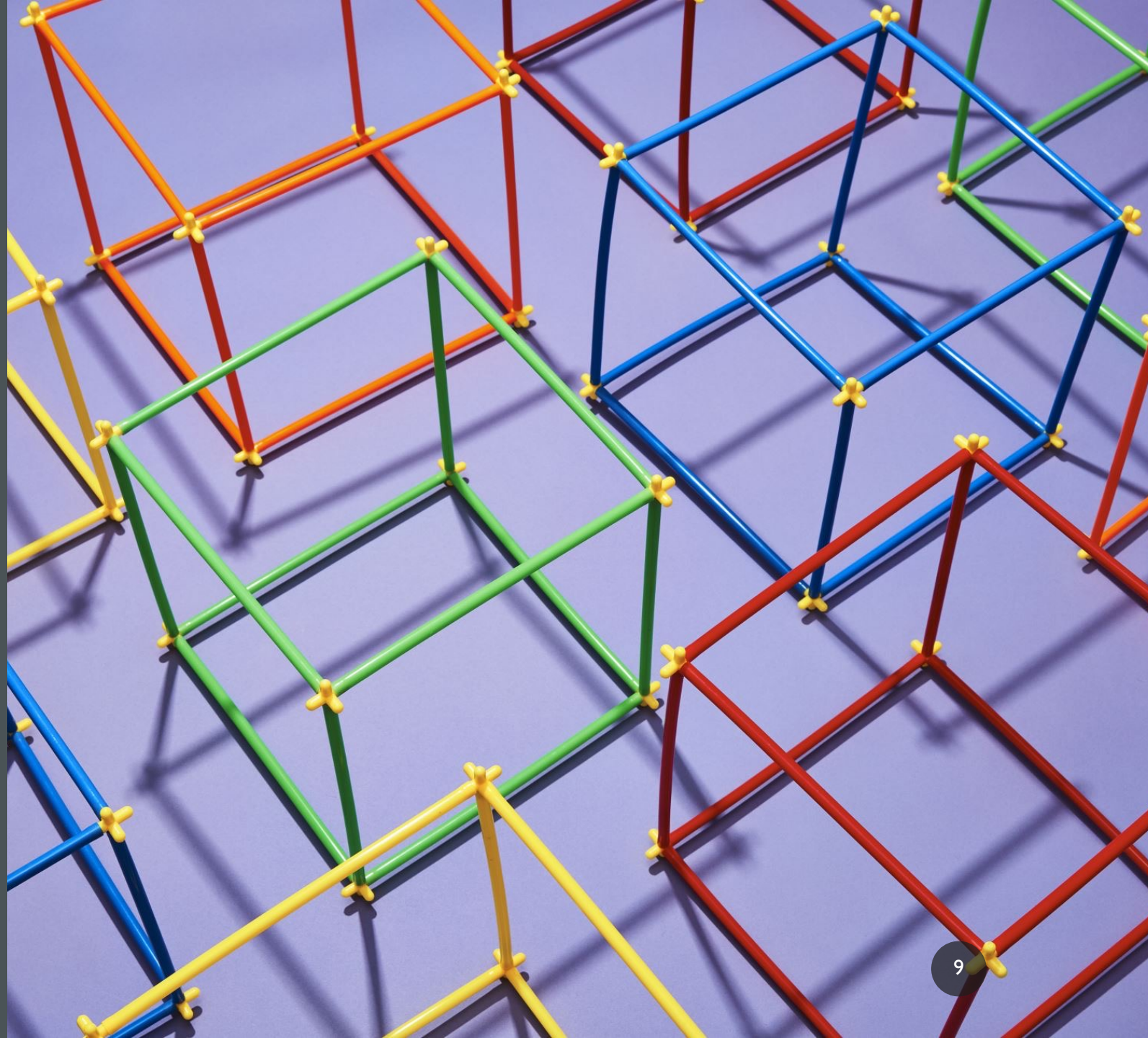
THE CHARACTERISTIC CURVES OF COMPOSITION.

Thomas C Mendenhall (1887) wrote one of the first statistical text analyses (Norman; Madigan & Lewis)

Photo by Thomas Millot on Unsplash

- Early studies can be also traced back to automatic translation projects in the 1940s and 50s (Witten).
- Kucera and Nelson Francis's work on the Brown corpus, a 1 million word database of American English (1967).
- First transcribed corpus of spoken language was created in 1971 by the Montreal French Project, 1 million words (Sankoff & Sankoff 1973).
- Another highly influential study is Kretzschmar et al. 2004's work on the US Tobacco Industry Documents Corpus.

GETTING YOUR TEXT DATA



DATA SOURCES

- University of Georgia Corpus Server
- Linguistic Data Consortium
- The World Wide Web
- UGA Library Databases
- The Linguistic Atlas Project
- The Hathi Trust Digital Library
- Project Gutenberg
- MONK: Metadata Offer New Knowledge: text analysis suite and public domain TEI texts
- TAPoR: Text Analysis Portal for Research at McMaster Uni
- Martin Weisser's list of historical corpora
- CLARIN historical corpora

THE UGA CORPUS SERVER

- The corpus server utilizes CQP. (Corpus Query Processor).
- For access to the corpus server, please email linglab@uga.edu.
- On the corpus server, we have access to many awesome databases of language, including:
- **EuroParl**
- **SpokenBNC 2014**
- **COHA: Corpus Of Historical American English**
- **The Brown Corpus**
- The Digital Archive of Southern Speech (DASS)
- Ancora

DATA PREP

ANALYZING YOUR DATA

- Example: proper in British vs American English (tognini Bonelli)
- Example: extracting sentiment from a group of reviews
- Example:

CONCORDANCE EXAMPLE

Source on Save | Run | Source

```
1143 polmineR::corpus()
1144 sAttributes("BNC-BABY")
1145 proper <- cooccurrences("BNC-BABY", query = "proper")
1146 print(proper)
1147 propD <- dispersion("BNC-BABY", query = "proper", s_attribute = "text_auth
1148 barplot(height = propD[["count"]], names.arg = propD[["text_author_sex"]],
1149
1150
1151
```

1149:1 (Top Level) R Script

Console | Terminal | Jobs

~/

```
> propD <- dispersion("BNC-BABY", query = "proper", s_attribute = "text_author_se
x", progress = FALSE)
> barplot(height = propD[["count"]], names.arg = propD[["text_author_sex"]], las =
 2)
>
```

METHODS: TEXT ANALYSIS

distant reading

natural language processing

machine learning

corpus linguistics, corpus-based analysis

METHODS: CORPUS LINGUISTICS

Frequency analysis

Analysis of multiword units (ngrams)

Collocation analysis

Keyword analysis

METHODS: NLP & MACHINE LEARNING

document classification

topic modeling

sentiment analysis

named entity recognition

TEXT ANALYSIS IS SCALABLE.

PYTHON LIBRARIES

- **spaCy**: pos tagging, tokenization, dependency parsing, etc. Check out this tutorial for more about NLP with spaCy
- **CoreNLP**: lemmatization, pos tagging, tokenization, named entity recognition
- **NLTK**: Natural Language ToolKit; contains over 50 corpora, includes options for tokenization, tagging, parsing, document classification
- **Gensim:** useful for various types of topic modeling
- **PyNLPI:** open-source NLP library; great for of tasks ranging from building simplistic models and extraction of n-grams and frequency lists, with support for complex data types and algorithms
- **Pattern**: useful for web-crawling (webscraping) for creating your own corpora; includes options for tokenizing, pos tagging, etc
- **Polyglot**: very useful library for other languages than English
- **TextBlob:** includes options for pos-tagging, noun phrase extraction, classification, translation and sentiment analysis

- **Tidytext**: helpful for data formatting and visualization; works well with other packages in the Tidyverse (Silge & Robinson 2016)
- **Textmining/tm:** includes options for data processing, metadata management, and creation of term-document matrices (Feinerer 2020; Feinerer et al. 2008)
- **Syuzhet:** package created specifically for sentiment analysis by Jockers
- **Text2vec**: dtm, vectorizing data, supports topic modeling and collocational analysis, too
- **StringR**: supports regex, pattern matching, useful for string manipulation
- **spacyR**: NLP package originally created for Python; useful for tokenization and works well with quanteda and tidytext
- **Quanteda**: incredibly useful package; includes preprocessing abilities, dtm function, as well as statistical analyses options like document classification and topic modeling
- **Ggplot2**: great way to visualize your data

RESOURCES AT UGA

- Corpus Server
- Upcoming Courses
- Digilab Resources
- Data Office Hours

COURSES AT UGA

- This Fall 2021:
- Natural Language Processing: LING 4570/6570
- Style: ENGL/LING 4826/6826
- American English: ENGL/LING 4010/6010
- Note: These all count toward the Digital Humanities Undergraduate certificate!

ADDITIONAL TOOLS

- AntConc: A free corpus analysis toolkit for concordancing and corpus-based methods
- Voyant Tools: web-based text reading and analysis environment
- Google Books Ngram Viewer: online search engine that charts the frequencies of any set of comma-delimited search strings
- Wordseer: text analysis environment that combines visualization, information retrieval, and nlp methods
- Tapor: web-based set of text analysis tools

ADDITIONAL TOOLS

- TextArc: A visual representation of a text.
- MALLET: Maps patterns across texts with various tools.
- Perl: was originally created to be a general purpose programming language to help with reports; includes many excellent text-specific functions; supports powerful regular expressions, string processing, and parsing
- SketchEngine: text mining app based out of the EU; includes options for your own corpora and includes 500+ other corpora
- http://corsis.sourceforge.net/: open source corpus software written in C
- ICECUP 3.1, Fuzzy Tree Fragments: based at UCL, set of corpus tools for parsed corpora like **ICE-GB** and **DCPSE**

DATA OFFICE HOURS

CONSULTATIONS FOR DATA CLEANING, STRUCTURING, AND VISUALIZING

Whether just starting your work, or trying to make sense of your research, schedule an appointment for our Data Office Hours and bring your data (text, archival information, numerical data, etc.) for advice and guidance on your project. Expertise in corpus linguistics, Excel, and R, among other tools for data structuring and visualization.

TUESDAYS • 4:00-5:00
WEDNESDAYS • 2:00-3:00

To schedule an appointment visit:
DIGI.UGA.EDU/RESOURCES

WILLSON CENTER DIGILAB

RECOMMENDED RESOURCES

- Brezina's *Statistics in Corpus Linguistics*
- Evert's work on collocations and corpus methods
- University of Lancaster Corpus for Schools
- Natural Language Processing with Python by Bird et al.; Na-Rae Han's python tutorials
- Silge and Robinson's Text Mining with R
- University of Birmingham, UK Centre for Corpus Research
- HELSINKI's VARIENG Center for Research

COMING UP NEXT…

8 April: Text Analysis for Literature and Beyond

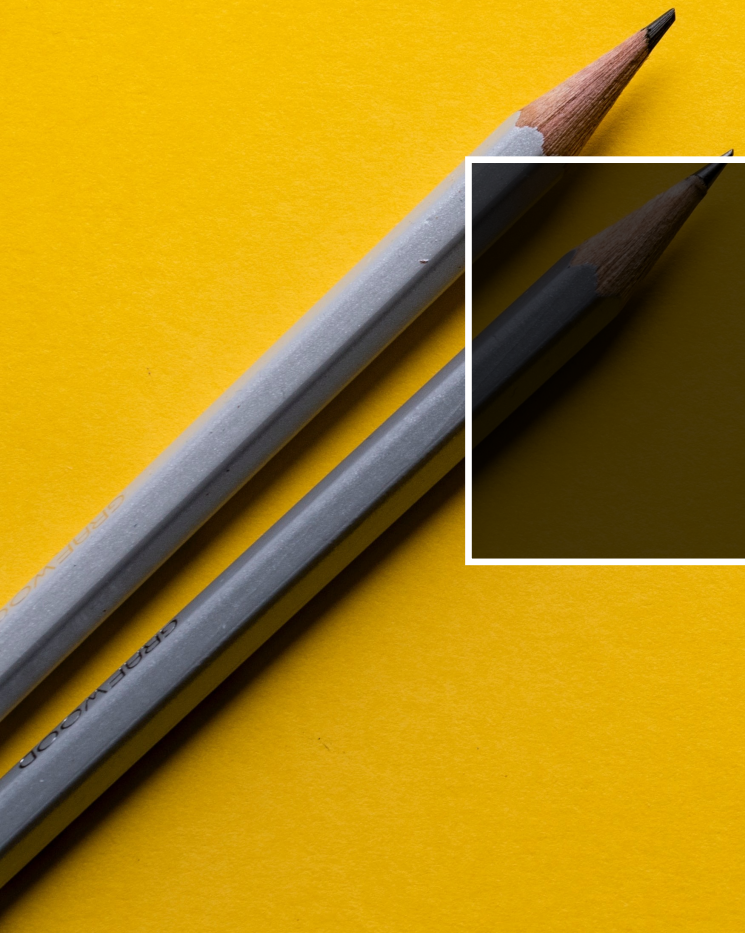
15 April: Creating your own Social Media Corpus

22 April: Text Analysis Applications: Social Media

IN PREPARATION FOR NEXT WEEK

Download and install:

R and R Studio



THANKS FOR LISTENING!

KATHERINE.KUIPER25@UGA.EDU

PLEASE FILL OUT THIS SURVEY.

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