

# DATA BEYOND VISION

Experimental physical representations of humanities data

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[10.5281/zenodo.3261531](https://doi.org/10.5281/zenodo.3261531)

## WHY

- Represent data in physical objects to contrast the limitations of visualization
- Invite engagement with humanities data through tangible objects
- Encourage others to take experimental approaches to data representation

## HOW

We selected data from Digital Humanities projects sponsored by the Center for Digital Humanities at Princeton we had contributed to. We chose data, material, and production methods that embedded meaning in the physical objects.

The labor of iteratively querying, experimenting, prototyping, failing and trying new options results in a “Slow Data” approach. This requires thoughtfully grappling with the data, the source project, physical production methods, and how we and our audience relate to them.



Sight requires distance and encourages a sense of mastery; touch requires proximity and encourages exploration.

### Critical Making

bridges the gap between creative physical & conceptual exploration

### Data Physicalization

is the building of physical objects

focuses on the process of data construction in physical form

### Data Visualization

is the use of graphical elements

focuses on storytelling

### Data Edibilization

is the use of edible materials

focuses on experiencing data through food

### Data Sonification

is the use of sound

focuses on auditory patterns

### Data Visceralization

is the use of multiple senses

focuses on multiple sensory experiences

### Data Art

is the use of expressive frameworks

focuses on representing links between data and artistic creations

### Interpretive object

is the use of metaphors

focuses on revealing meanings & relationships via non-textual forms

Touch

Sight

Taste

Hearing

Data

can promote Accessibility

is essential for understanding

## Shakespeare and Company Project

Tracks the membership of Sylvia Beach's lending library to reveal what members read and where they lived in interwar Paris.



### A/ 3D printing

#### » Data

Membership events over time based from two different, *incomplete* sources:

- broad subscription information from ledgers,
- detailed borrowing histories for a subset of members.

#### » Goal

Easily adoptable, lower-barrier entry for others to physicalize data.

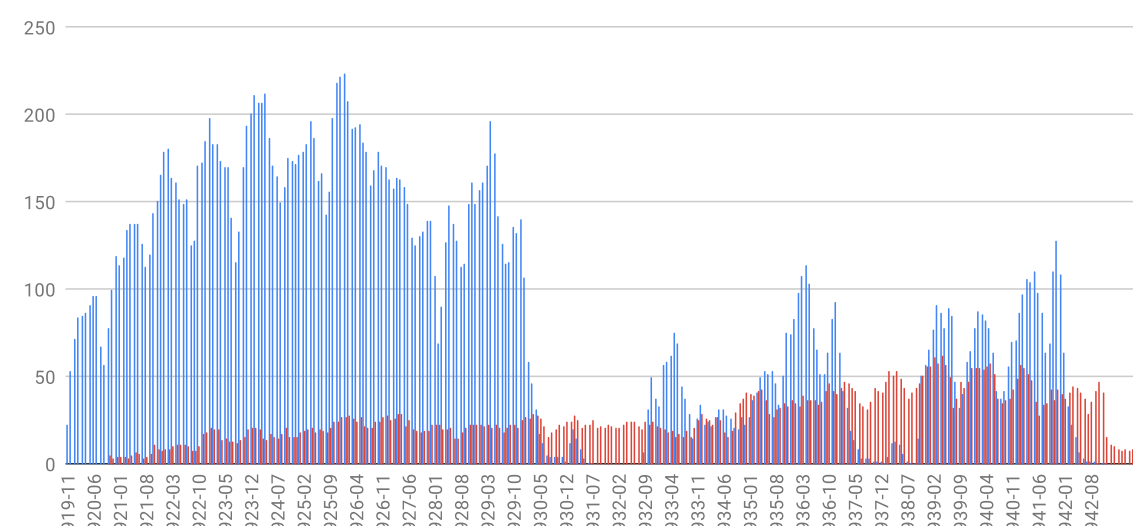
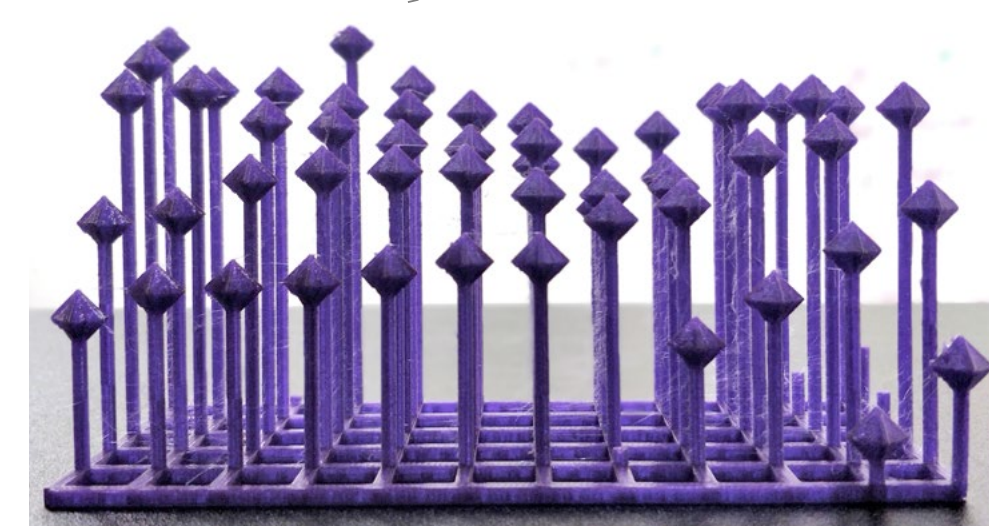
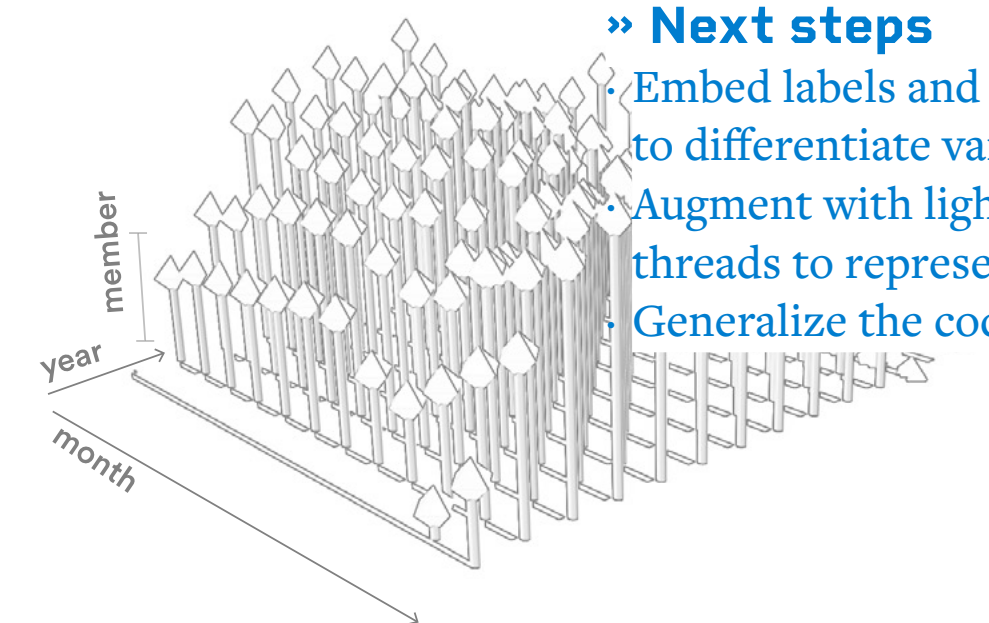
Display the complicated relationship between two different partial historical data sources.

#### » Approach

Prototyped with Lego, simple 3D modeling in OpenSCAD; shifted to Blender and Python. Started with a simple bar chart; shifted to a lollipop chart to allow combining two variables without giving one primacy. Displaying member totals by years along one axis and months along the other allow to compare both monthly and yearly trends. Experimented with custom shapes but daunted by printing so many individual objects.

#### » Next steps

- Embed labels and markers in the 3D model: incorporate braille, add textures to differentiate variables by touch.
- Augment with lights & sound to convey intensity of activity for each year, threads to represent the number and duration of subscription renewals.
- Generalize the code for reuse; possibly make available as a Blender plugin.



Members with active subscription, members with card activity by month, 1919-1942

### B/ Origami

#### » Data

Borrowing events for library members with extant lending cards.

#### » Goal

Highlight the library activity of non-famous members in contrast to the “famous” members the library is usually associated with. An interactive installation would allow participants to recover the names and reading habits of regular members by recreating their activity.

\* Fame here designated by an associated VIAF record as identified by project researchers

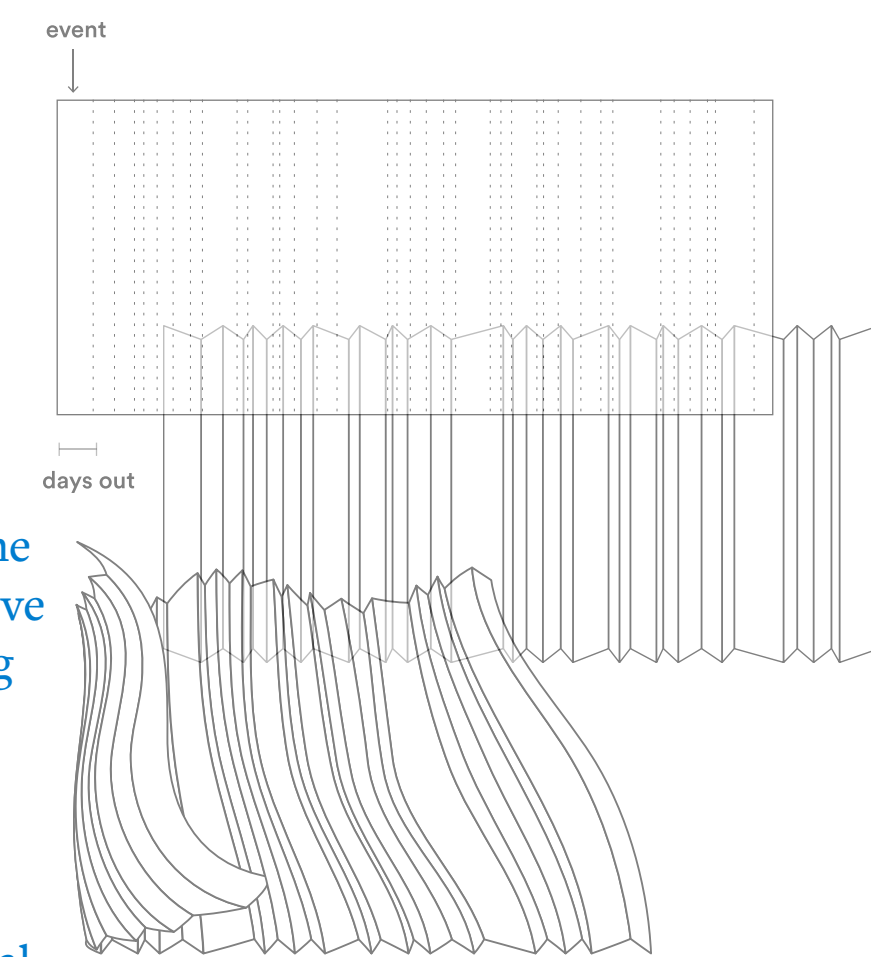
#### » Approach

Experimented with a variety of forms and folds: intricate forms were too demanding; basic mountain and valley folds representing individual borrowing events and their duration were feasible and visually appealing, but didn't provide sufficient interpretive value.

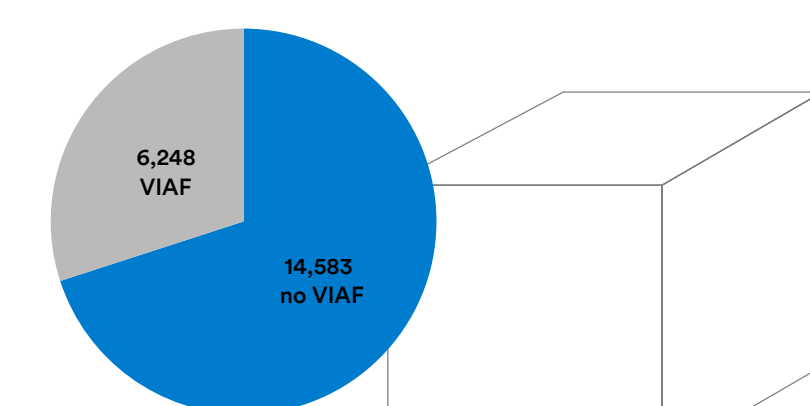
Shifted to unit origami and representing the ratio of reading activity in aggregate. Totals for borrowing data are represented as intersecting polyhedra to physically convey the relationship between the two groups via volume. The form is folded from paper printed with the names of the non-famous members.

#### » Next steps

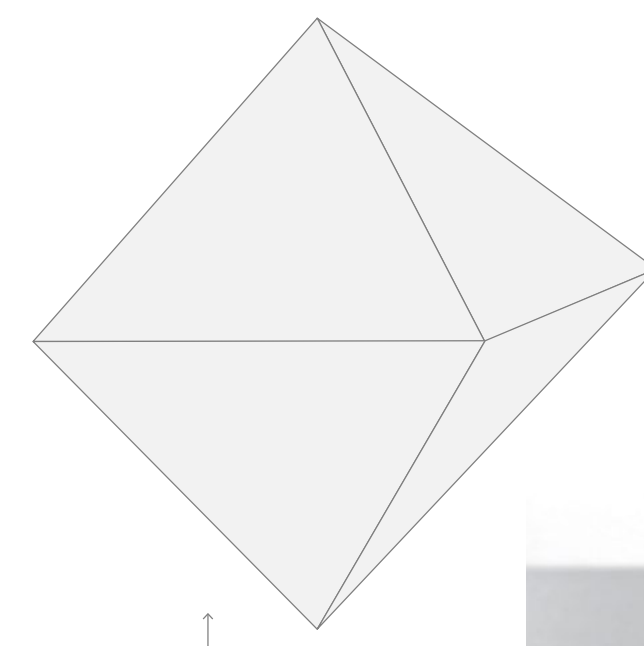
- Use cut, punched, or embossed paper for an additional tactile aspect
- Represent data by actual number or content of paper units instead of volume



Prototype showing individual borrowing events



volume = VIAF members



volume = non-VIAF members



## Derrida's Margins

An online research tool for the philosopher's annotations that provides a behind-the-scenes look at his reading practices and the philosophy of deconstruction



[derridas-margins.princeton.edu](http://derridas-margins.princeton.edu)

### C/ Weaving

#### » Data

References in Jacques Derrida's *de la Grammatologie* organized by page and categorized by type, associated with details about the referenced works.

#### » Goal

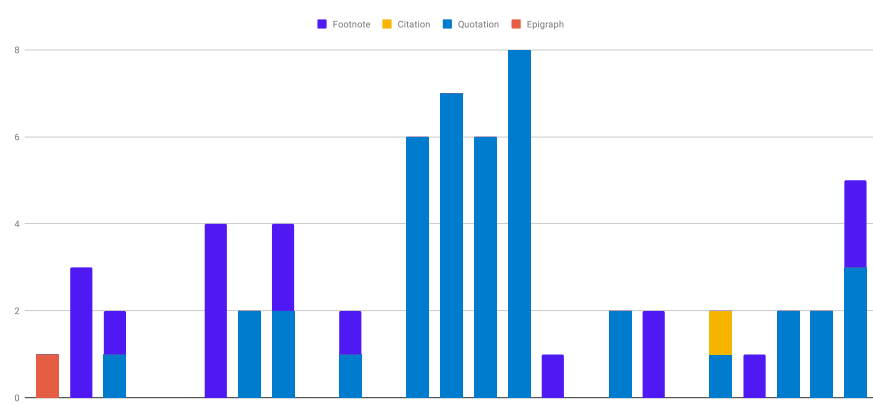
Literalize the metaphor of writing as weaving by representing Derrida's intertextuality as a woven tapestry based on the data for references in *de la Grammatologie*. Exhibit an in-progress weaving with pattern and instructions provided to allow participants to contribute to the physicalization.

#### » Approach

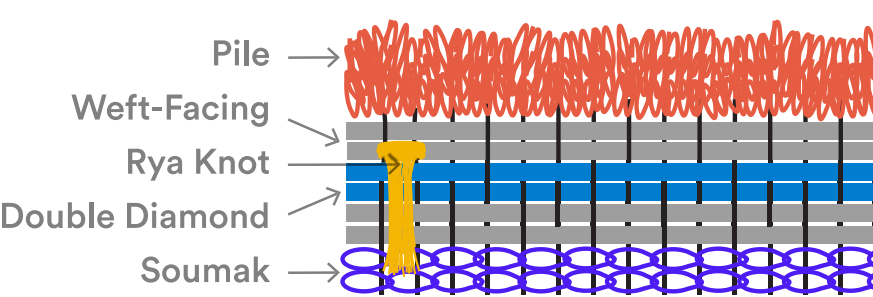
Researched different kinds of looms and approaches to pattern designs (e.g. warp-faced and weft-faced), prototyped weaving to become more familiar with the mechanics and skills. Simplified by picking a single representative chapter and only mapping reference type to the weaving pattern. The more we learn about weaving, the more our understanding of weaving as a metaphor for writing shifts.

#### » Next steps

- Represent more aspects of the data through different kinds and sizes of fiber.
- Use conductive thread to turn the weaving into an interface.
- Augment with lights & sound to convey reference activity by page.



Instances of reference by type from *De la Grammatologie*, chapter 1



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This is an on-going project, for updates:  
[cdh.princeton.edu/projects/data-beyond-vision](http://cdh.princeton.edu/projects/data-beyond-vision)



Pratt