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SARC 5400: Data Visualization
11 April 2023

Final Project, part 1 - Ugly Sketch & Prototype

What is/are your question(s)?

How can we better represent the physical size of medieval manuscripts (and other rare books) to users in the digital space? Why is it so difficult to visualize size on a screen? Why is it important to think about manuscript size? Why does the size of a manuscript matter?

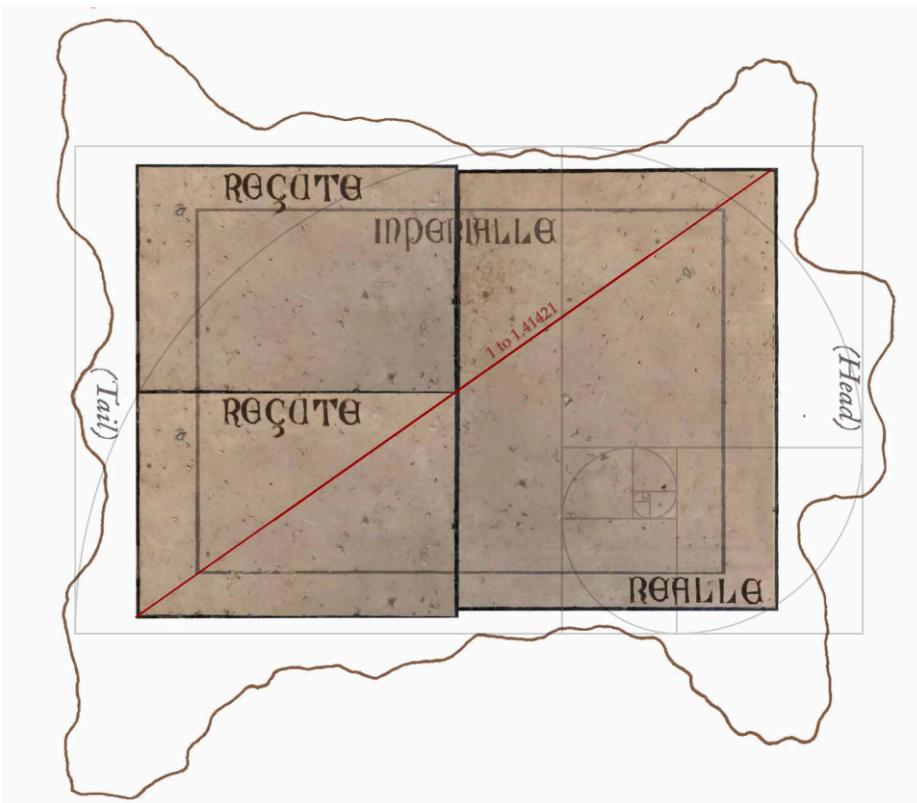
The core questions of my final project may seem simplistic or dry to those who don't work with rare books and manuscripts, but the issue of size is something that plagues manuscript researchers especially now that the bulk of manuscript research occurs in the digital space and not in front of the actual objects themselves. Before having the opportunity to visit a manuscript in person, researchers generally pour over the data available to them in catalogs to familiarize themselves as much as possible with their objects of interest, and yet universally, researchers then experience this beautiful moment of surprise when the manuscript is finally placed in front of them. There's this immediate "Oh! That's what it looks like!" that inevitably changes the researcher's relationship to the manuscript and provokes new ways of thinking about the book as a material object. Part of this moment of revelation has to do with the size of the manuscript. Manuscripts are generally described in catalogs by height and width (and frustratingly not by depth!) in millimeters, but it can be hard for even the most experienced of researchers to then conceptualize their manuscript's size until they've seen it themselves in person. With my final project, I would like to produce an interactive visualization tool that allows users to input their manuscripts' dimensions and then get an output that puts the size of their manuscript into perspective.

There are some precedents to visualizing size when it comes to parchment and paper. One of the latest interesting visualization tools in the field of manuscript studies is the [VisCollEditor](#) by the Schoenberg Institute for Manuscript Studies. This visualization tool allows users to get a better understanding of the physical collation of their manuscripts, which can then help researchers to better understand the complex binding history of their objects. Also by the Schoenberg Institute, there is a great tool called the [Needham Calculator](#) (named for the bibliography great Paul Needham) that allows you to figure out the size of the original sheets of paper (before they were cut, folded, and bound) used to produce any given 15th century codex. Such a tool may seem laughably niche in terms of its usefulness, but this sort of calculator enables researchers to think about bigger questions that connect our research of any one object to the larger history of books.

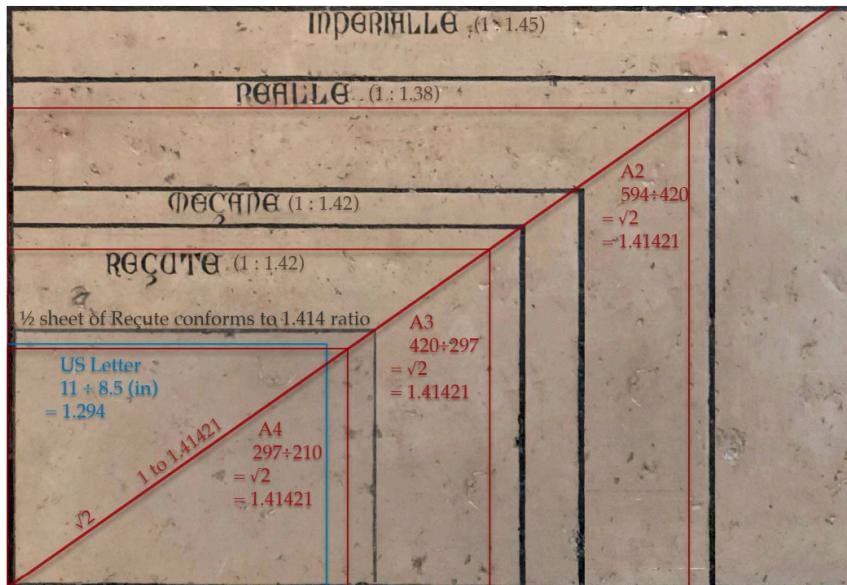


In medieval Italy, stones like the one pictured here would be posted in public so that bookbinders, papermakers, book buyers, and others could hold up a physical sheet of paper and check to see that its dimensions met the standard sizes of paper available. This sort of standardization allowed for greater ease when it came to print, binding, storing, and transporting books of all genres. And because of increasing research attention to the question of book size, researchers are finding that these standardized sizes can tell us a lot about the history of books as it projects backward into the era of medieval parchment-based manuscripts *and* about our own book practices today. For instance, there is increasing evidence that the reason books are generally rectangles with a ratio size of $\sqrt{2}$ is because this ratio would have allowed innumerate parchmenters to produce the largest, uniform sheets of parchment from an animal hide possible. These sheets could then be folded or cut in half as many times as necessary (without being measured by someone with no training in math or any universally standard unit of measure) to

produce uniform sheets of parchment and thereby uniform sized, rectangular books.



The rectangle based on the square-root of two seems to go back to well before the beginning of the Western book [...] It is a moot point as to whether the Medieval Italian parchment workers, who passed this precious snippet of knowledge on to the papermakers, were aware of all the geometry, since in cutting up an animal skin, this particular rectangle produces the least wastage. However, they knew enough to understand the principle and to construct their rectangles accordingly. (Harris, "The Shape of Paper," Institut d'histoire du livre)



A rearrangement of the four Medieval paper sizes on the Bologna Stone comparing the Medieval paper sizes to a 1 : 1.41421 ratio and to modern A2, A3 and A4 paper sizes. Shown in blue is the rather awkward-looking and ill-fitting US Letter dimension.

All this to say: when it comes to rare books and manuscripts, size matters! And size is difficult to conceptualize as a dry table of numbers like this one:

Category	Full sheet	Folio	Agenda Quarto	Quarto	Octavo	16o	32o	64o
Imperial	48x68	48x34	48x17	34x24	24x17	17x12	12x7.5	8.5x6
Super-Royal	45x60	45x30	45x15	30x22.5	22.5x15	15x11.3	11.3x7.5	7.5x5.6
Royal	42x60	42x30	42x15	30x21	21x15	15x10.5	10.5x7.5	7.5x5.3
Super-Median	37x50	37x25	37x12.5	25x18.5	18.5x12.5	12.5x9.3	9.3x6.3	6.3x4.6
Median	35x50	35x25	35x12.5	25x17.5	17.5x12.5	12.5x8.8	8.8x6.3	6.3x4.4
Super-Chancery	33x46	33x23	33x11.5	23x16.5	16.5x11.5	11.5x8.3	8.3x5.8	5.8x4.1
Chancery	31.5x46	31.5x23	31.5x11.5	23x15.8	15.8x11.5	11.5x7.9	7.9x5.8	5.8x3.9
Half-Median	25x35	25x17.5	25x8.8	17.5x12.5	12.5x8.8	8.8x6.3	6.3x4.4	4.4x3.1

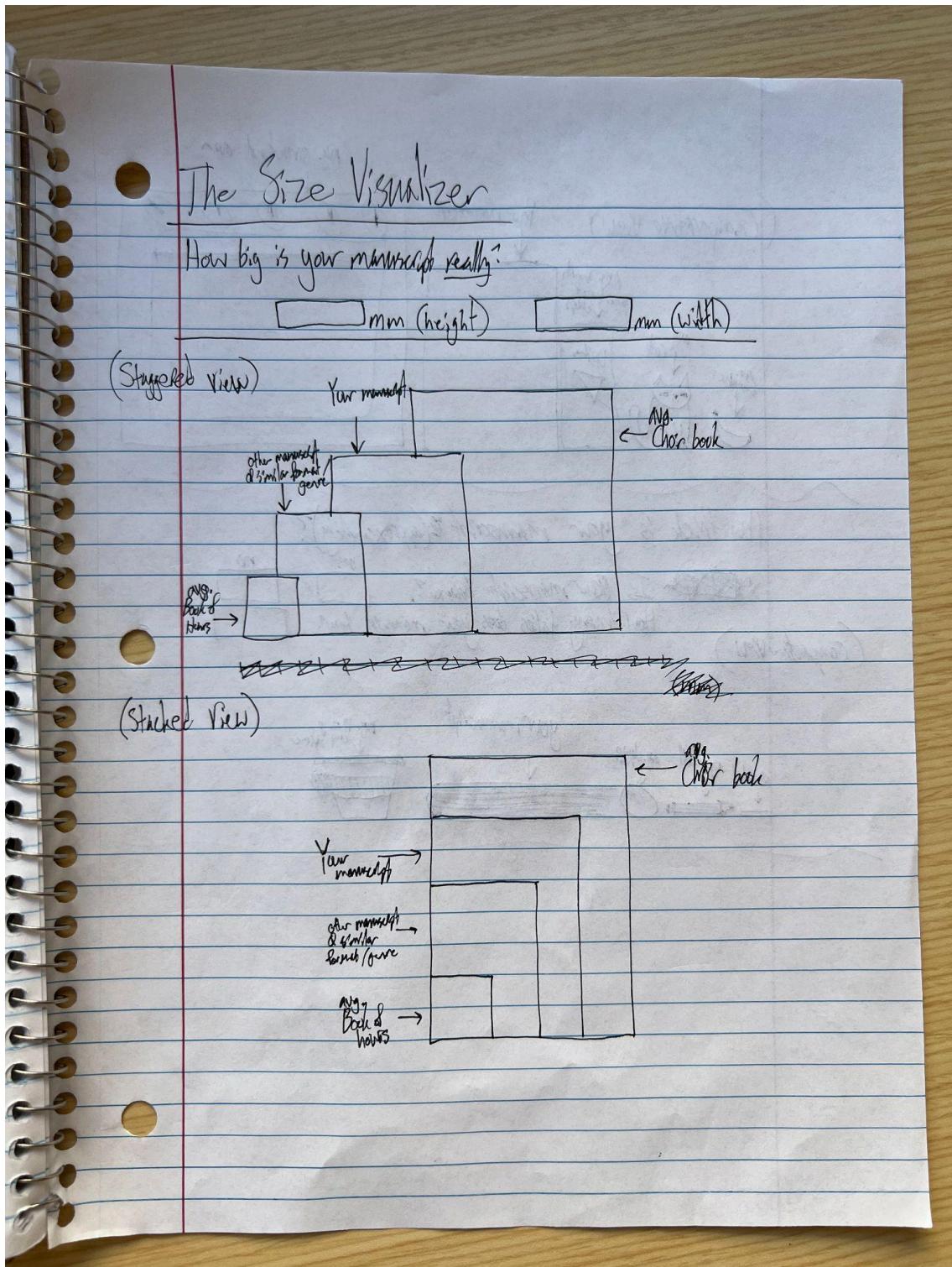
A Table of Fifteenth century paper FLAVORS

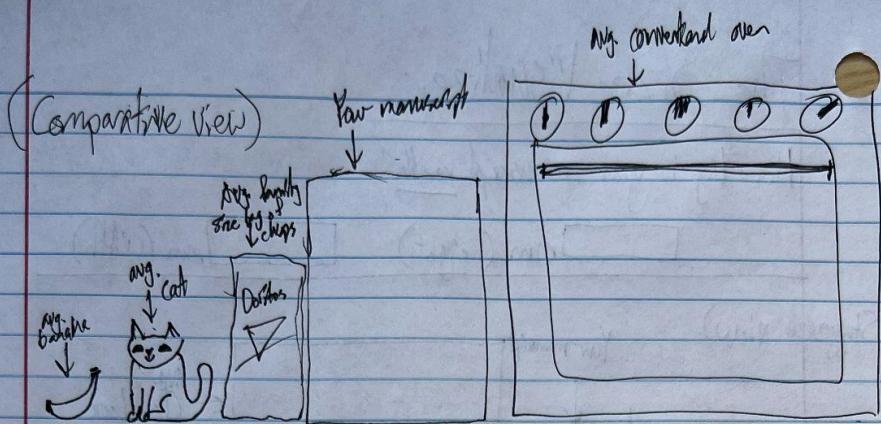
(Two additional categories are not considered here, both of which were made at the very end of the fifteenth century: the massive "Papal" paper, and a category that, when folded into octavo, created the tall, elegant Aldines that were printed from the early 1500's)

And even when one is working with manuscript objects in person, it is usually impossible to stack manuscripts on top of each other to compare them. (Unless you're Paul Needham himself, pictured here)



'Ugly Sketches':





How thick is your manuscript? (approximately)?

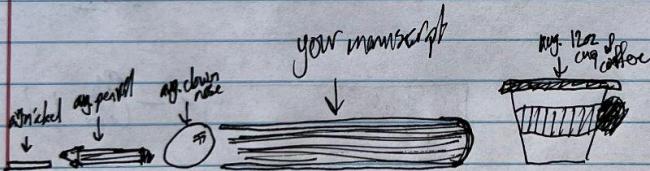
~~Is your manuscript bound?~~

How many folios does your manuscript have?

yes

no

(Comparative view)

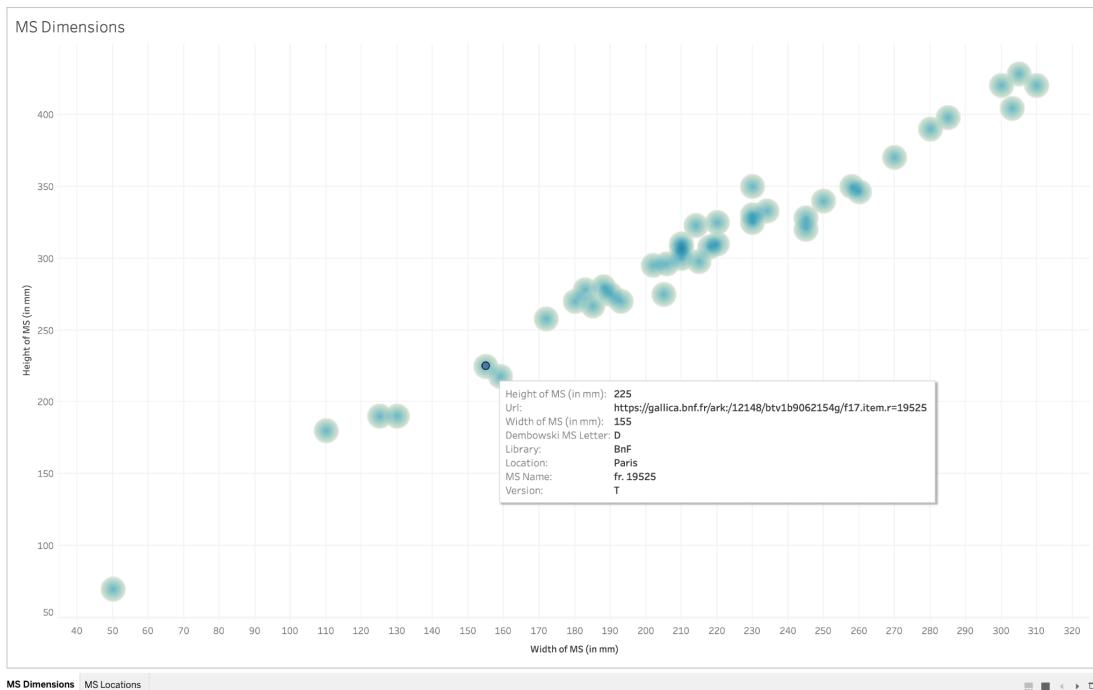


Data:

For my own dissertation research, I'm working on manuscripts containing the French saint's Life of Mary the Egyptian. There are about forty manuscripts that I'm looking at for this project. Here is my rough metadata spreadsheet: [ME French MSS Metadata](#)

As I try to build my interactive visualization tool, I could use the dimensions of my own manuscripts to inform my design decisions, but I am also now in conversation with the Special Collections library here at UVA to see if I could pull their data on late medieval European manuscripts so that I could have a much larger sample size of manuscripts to think about. The sizes of manuscripts in the university's collection range from books of hours the size of a match box to massive choir books the size of whole couch cushions!

Prototype (Tableau Density Plot):



I previously put together this visualization in Tableau of the sizes of my own manuscripts, and this work is what inspired me to think more about developing a digital visualization of size. For my final project, I plan on using Observable so that I can take advantage of the interactivity on that platform possible through d3. I've struggled with Observable in previous assignments, but I'm hoping our work on the Land guzzlers lab will inform my work on visualizing manuscripts as rectangles in comparison with other set objects (the average sized cat or a banana for example.)