The Beginner's Guide to Dimensionality Reduction

Explore the methods that data scientists use to visualize high-dimensional data.

By: **Matthew Conlen** and **Fred Hohman**

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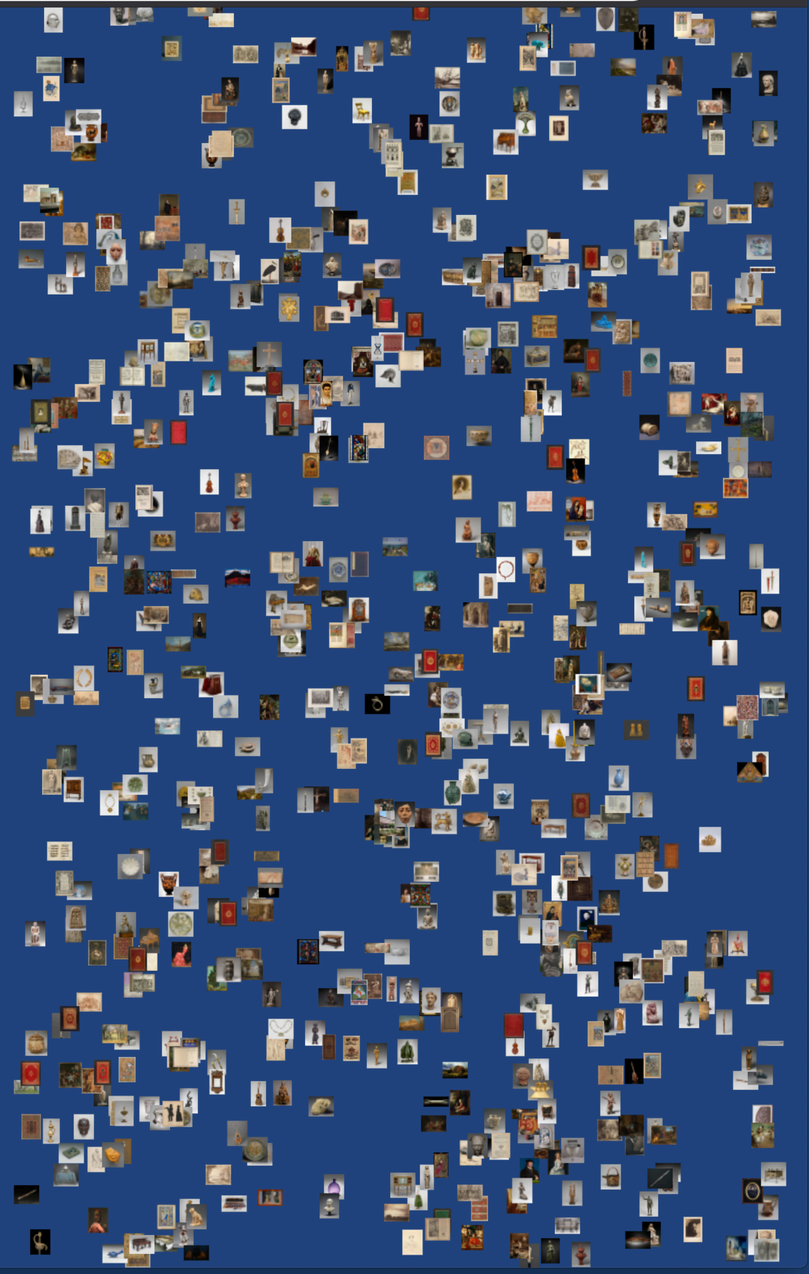

Dimensionality reduction is a powerful technique used by data scientists to look for hidden structure in data. The method is useful in a number of domains, for example document categorization, protein disorder prediction, and machine learning model debugging[2].

The results of a dimensionality reduction algorithm can be visualized to reveal patterns and clusters of similar or dissimilar data. Even though the data is displayed in only two or three dimensions, structures present in higher dimensions are maintained, at least roughly[7].

The technique is available in many applications, for example Google's Embedding Projector[10] let's you view high-dimensional datasets embedded in two or three dimensions under a variety of different projections.

This guide will teach you how to think about these embeddings, and provide a comparison of some of the most popular dimensionality reduction algorithms used today.

Who it Reached

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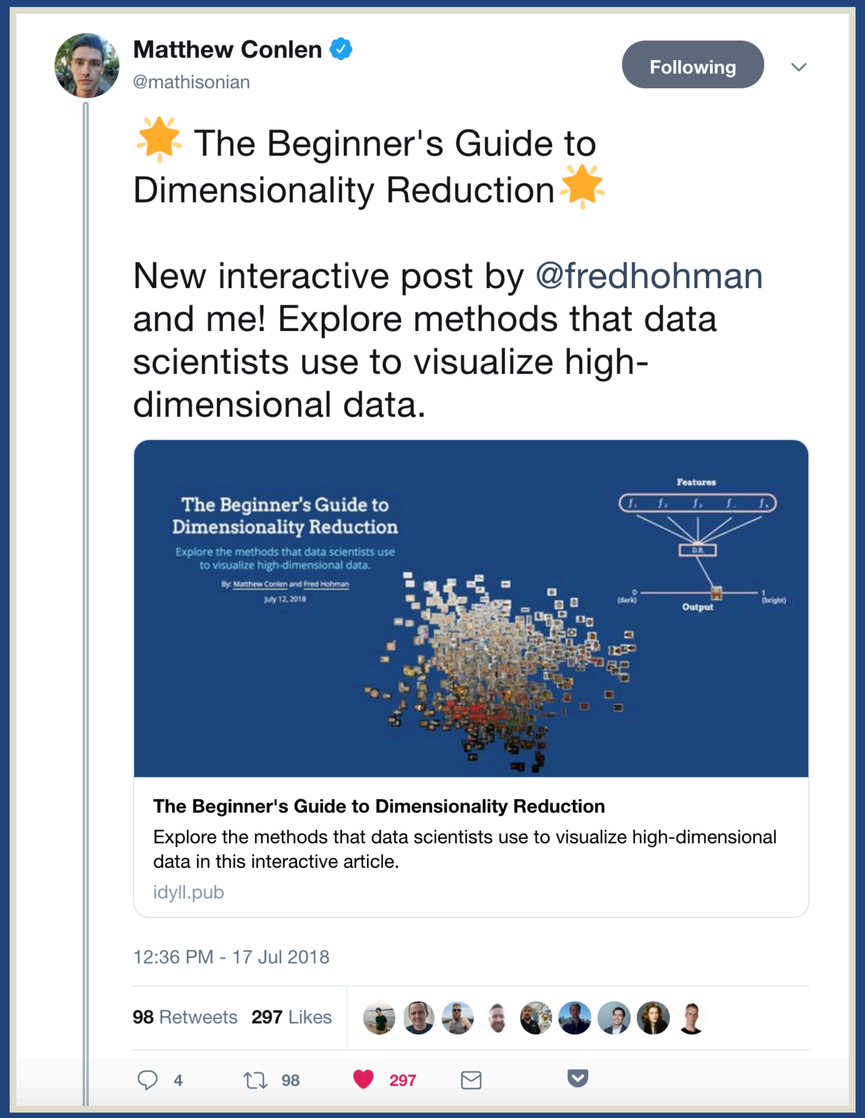

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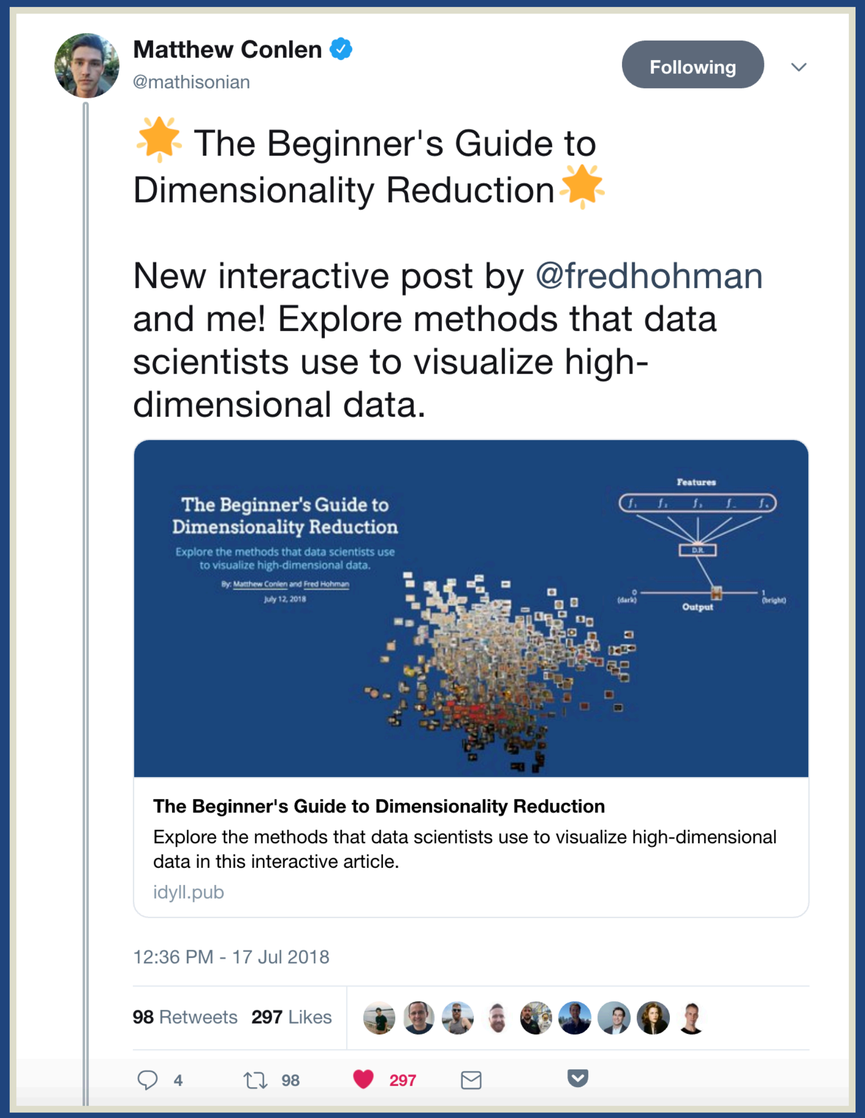

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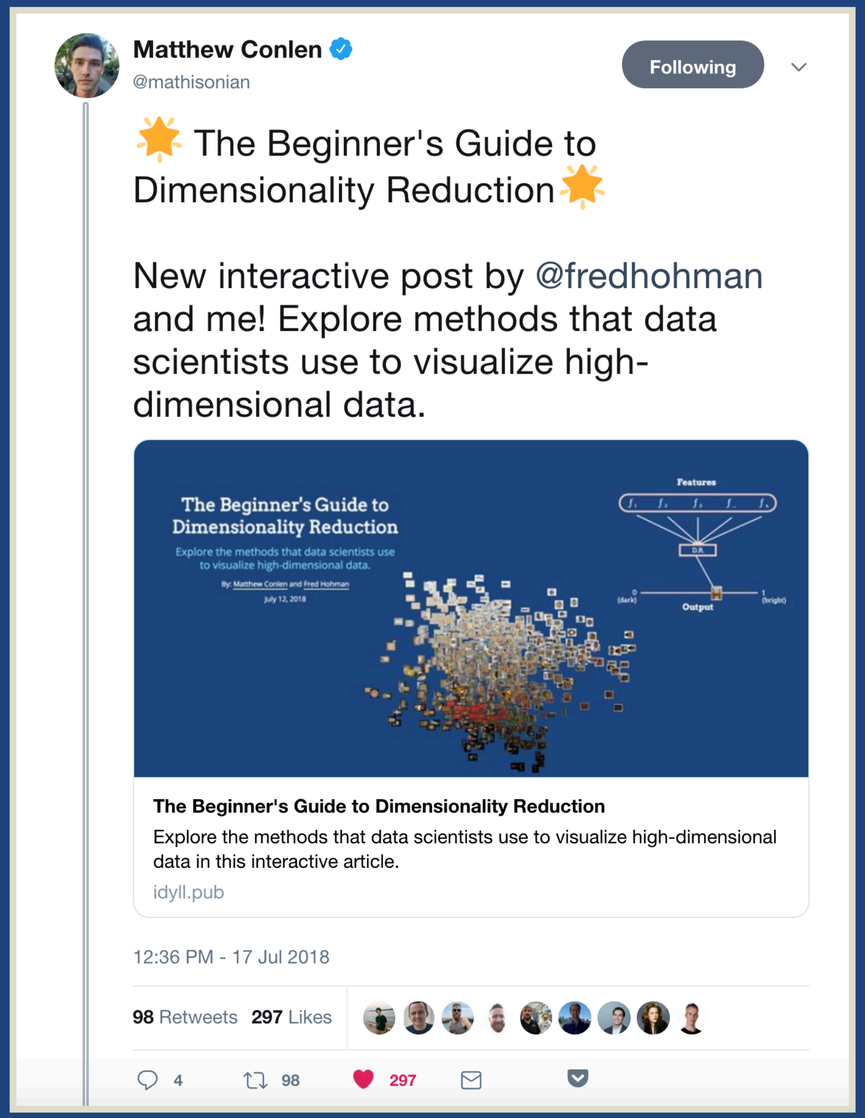

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Audience

7k visits from 4.5k “readers”

Practicing data scientists, researchers, and students

How People Engaged

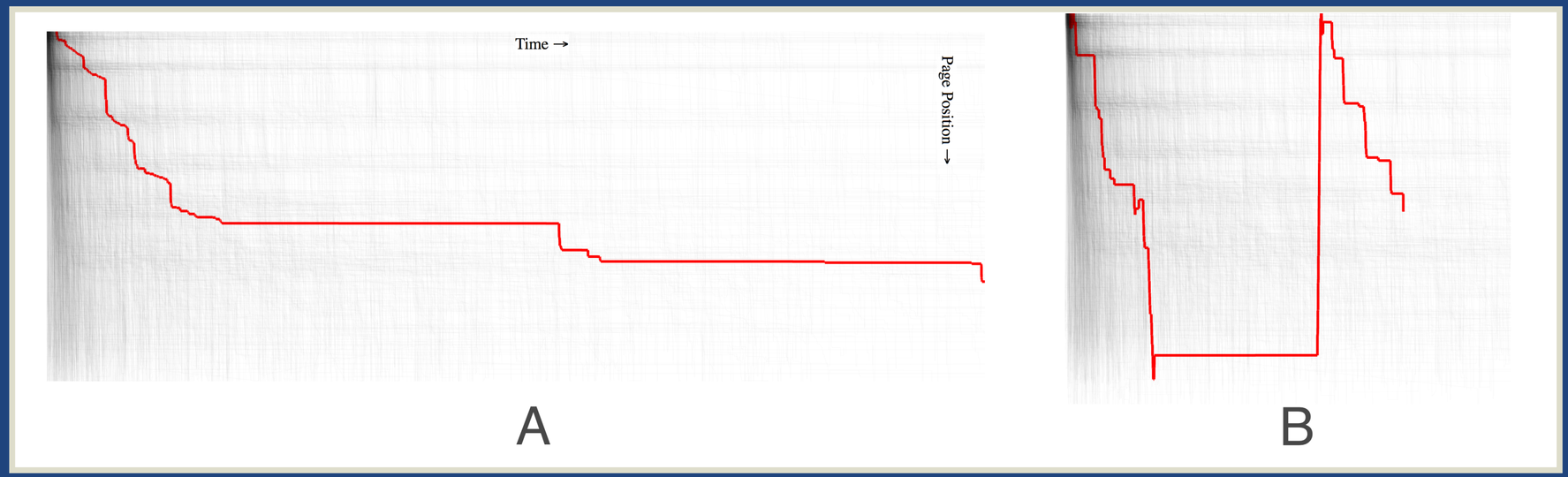
Overall

*76% finish the article

Long tail engagement distributions across most interactions

Most visitors skim, 6% read through multiple times

Scroll Patterns



*desktop, mobile coming soon

Feedback

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arcane_neptune 2 points · 3 months ago

Thank you for this. I'm trying to learn PCA for undergrad research.

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Just note that this is the very "dangerous" side to data science, where only the output of various methods are described, and not the underlying methods themselves!

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OP had a good intro to whet the appetite. If you want to learn more about what PCA is and how to implement it (including Python code), check this out.

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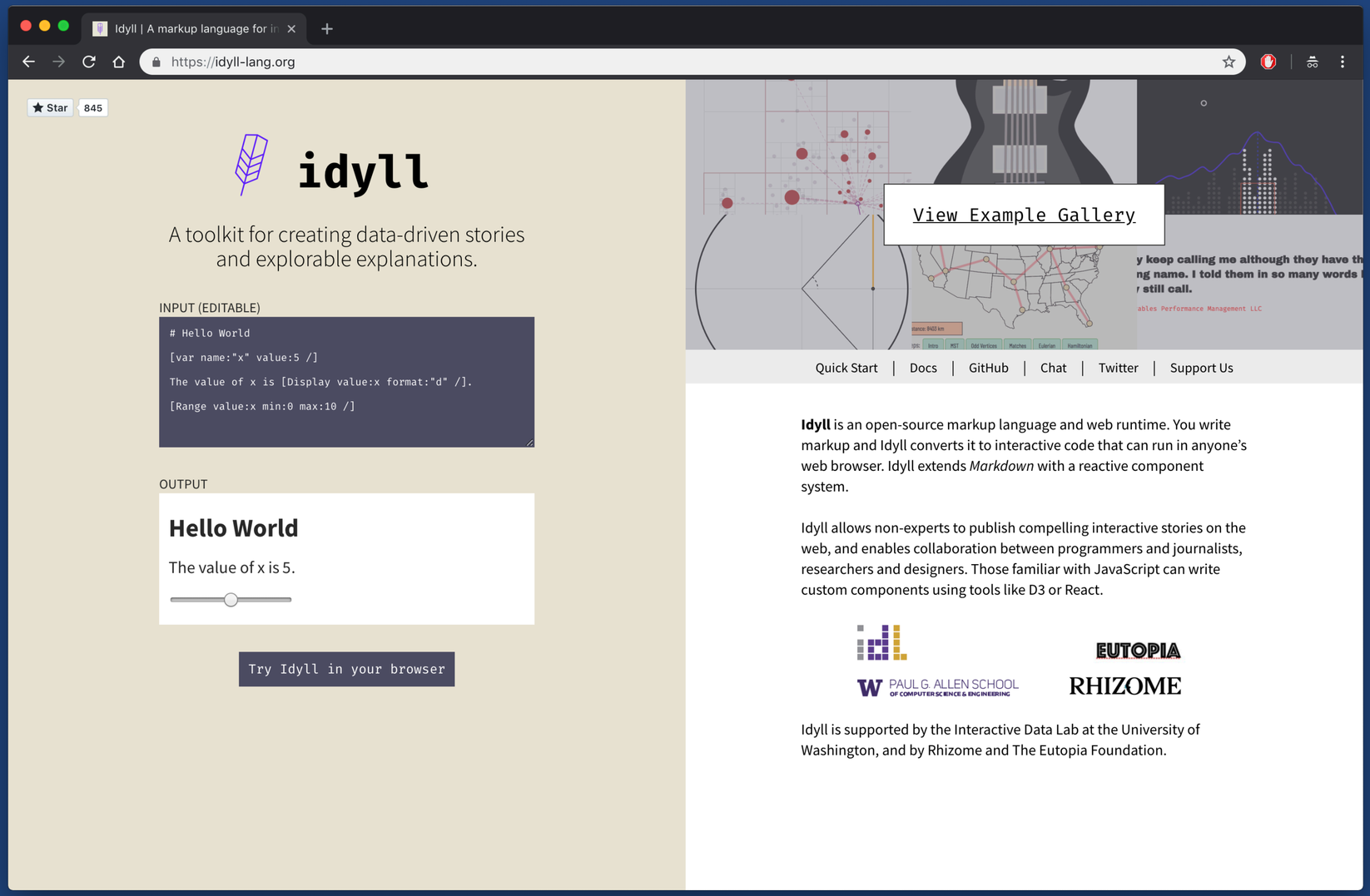
How We Made It

Idyll

https://idyll-lang.org/



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https://github.com/mathisonian/dimensionality-reduction

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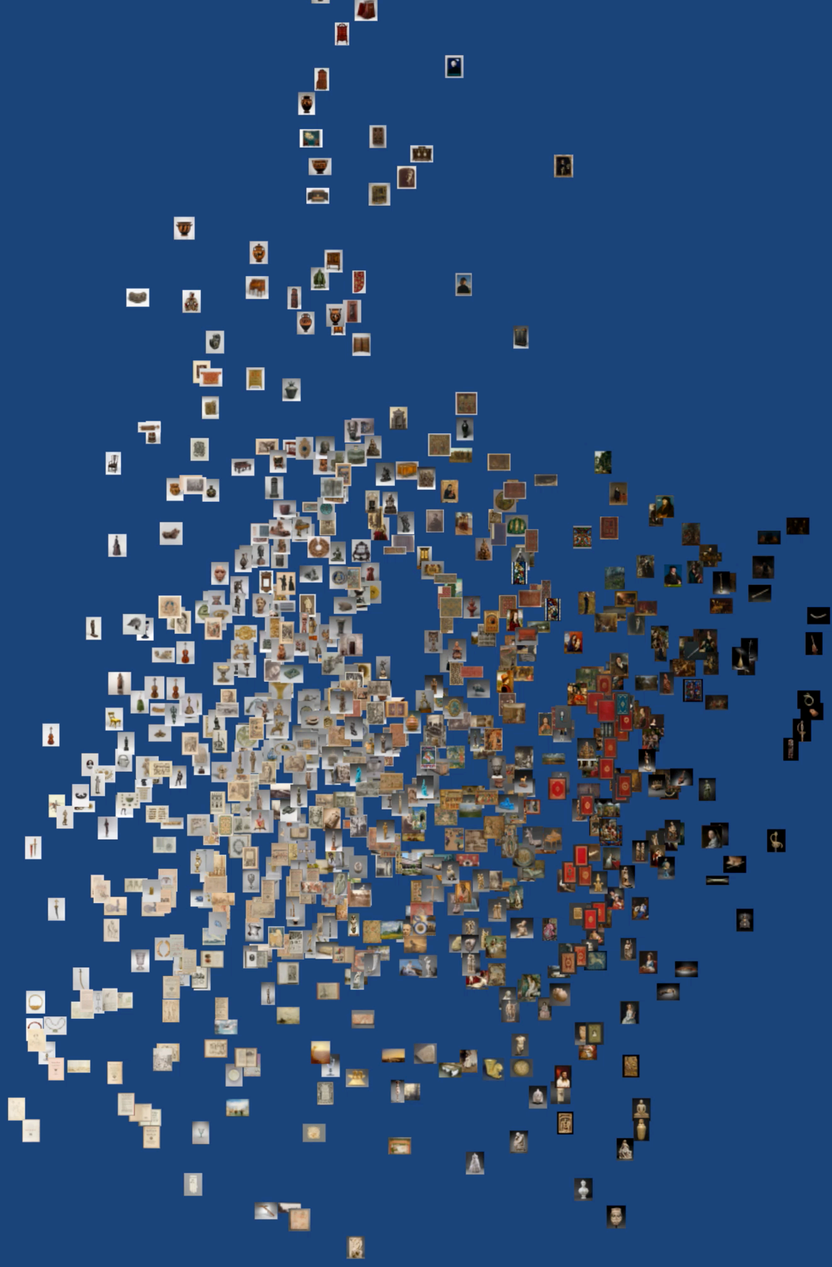

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