

# RIJKSVIZ

## ABSTRACT

Art has not traditionally been quantified in large datasets available to the public, but this has changed over the last several years thanks to the digitization of many collections. Our team utilized this opportunity to create four unique web-based 'exhibits' that help users explore and interact with the Rijksmuseum collection in ways previously unavailable. We start by visualizing all of the museum's paintings, which highlights the sheer scale of art kept in storage. Next, we focus on one of the most impactful dutch artistic movements, the Hague School, and empower the user to interactively discover variations in color and canvas size used by the artists. Next, we create a "social network" for the museum, to playfully enable users to explore the painted faces present within the collection. Finally, we animate the colored pixels of the museum's most well-known masterpieces, allowing the user to view and engage with famous paintings in novel ways.

A screencast of our work can be found at the URL: <https://youtu.be/3eq03WRx1NI> while the website can be accessed at the address: [www.rijksviz.com/visap](http://www.rijksviz.com/visap) using the username **visap** and password **visap2017**.

## INTRODUCTION

Museums exhibit much of today's art, yet a large portion of their collections remain in storage and out of view[1]. As Human-Computer Interaction designers, we wanted to utilize technology to make this 'hidden' art accessible to the general public and enable new ways of interacting with it. This is made possible by the recent

trends in the digitization of art, spearheaded by global initiatives such as Google Arts and Culture[4], or more local efforts led by individual museums. For our project, we focused on The Rijksmuseum, the largest art museum in Amsterdam and notable for masterpieces by Rembrandt, Frans Hals, and Johannes Vermeer, because of its renovation in 2013 and its forward-thinking digital initiatives[2]. Using The Rijksmuseum's API, we want to enable users to digitally **explore** and **interact** with its entire collection in novel ways not possible at the physical location.

## RELATED WORK

There have been many recent initiatives spearheading the digitization of art. Large scale initiatives like Google's impressive Arts & Culture projects[4] inspired us to look into this domain. Like the Rijksmuseum, other high profile museums such as the MoMA[6] in New York or the Tate Modern[7] in London in are making all, or a portion, of their collections available to the public online. We decided to explore canvas size data after seeing both Oliver Roeder's[10] and James Davenport's[14] work with the MoMA's API and the Tate's API, respectively, and color data after seeing Gabriel Gianordoli's project, The Colours of Art[11]. Our Hague School page implements similar visualizations, but uniquely focus on a specific subsection of artists at the Rijksmuseum over time and uses interactivity to connect the two visualizations. We decided to use facial recognition technology after reading about The Next Rembrandt[12], where a team produced a 3D printed "painting" based on the analysis of Rembrandt's body of work. Local Projects also used facial recognition[13] at The Cleveland Museum of Art to enable users to "browse with



Rijksmuseum's grand opening celebration after a decade of renovation.  
[Photo Credit: rijksmuseum.nl]

[their] face” in order to surface artwork from their collection that has the same facial expression. Our Faces of the Rijks page distinctly introduces social media as a way to use this technology to browse.

## RIJKSVIZ EXHIBITS

We are using the Rijksmuseum API [5]. This JSON-based service provides us with access to nearly 600,000 unique art pieces and their characteristics including, but not limited to: dimensions, materials, artist, date created, style, etc. After narrowing our scope to just the painting collection, we created a set of interactive visualization that we hosted online[8]. With a home page serving as the hub, visitors may explore the four digital ‘exhibits’ we created using the Rijksmuseum’s painting collection. Beyond the Exhibits answers the main question we posed to ourselves, “how much of the Rijks’ painting collection is not publicly displayed?”, and with that answer serving as the initial rationale and justification for our project. We start with a conventional visualization approach in The Hague School exhibit, which takes two typical dimensions of paintings (color and canvas size) from the Hague School group of artists and visualizes them in a connected fashion. Then, in Faces of the Rijks, we introduce a new dimension and paradigm for exploration to this historical collection of paintings: the faces depicted in the portraits and their characteristics. Lastly, we break down a painting’s pixels by their color and use animation to reassemble the museum’s masterpieces in an engaging fashion for the user.

### Beyond the Exhibits

This visualization features all of the

Rijks’ 4,000 paintings in thumbnails, ordered from the earliest time period to the latest along the horizontal axis and stacked in histogram form. The top half of the chart displays the paintings currently on display, while the bottom half displays the paintings in storage. It becomes immediately clear that visiting the museum’s exhibits only scratches the surface of the impressive collection, which addresses one of the main questions of our visualization. Interestingly, this proportion varies by the era in which the art piece originates from, revealing the many acquisitions of Dutch Golden Age painting from the 17th century. Looking forward, we are interested in expanding this section to empower users to browse archived work further. Revealing stored art provides an exciting opportunity because it is one of the few clear advantages technology has over an in-person museum experience.

### Faces of the Rijks

Using face recognition technology, we sought to create an exhibit with a theme familiar with most people - Facebook - by identifying all of the faces within the Rijksmuseum’s paintings. We ran facial detection algorithms on each painting using a cloud-based service called Kairos[3]. Although not completely perfect, the results have been impressive with the vast majority of faces in each processed painting, more than 4,000 faces in total, identified by the API, which also provided additional information such as estimated gender, age etc. Using these results, we playfully bring the museum’s characters to life by giving each of the “individuals” (faces) a social media page, where we listed their “personal information” such as birthday, ethnicity, gender, and skin texture. By

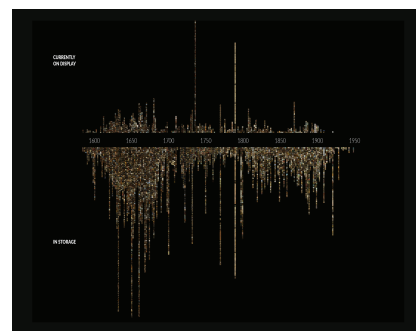


Exhibit 1: Beyond the Exhibits

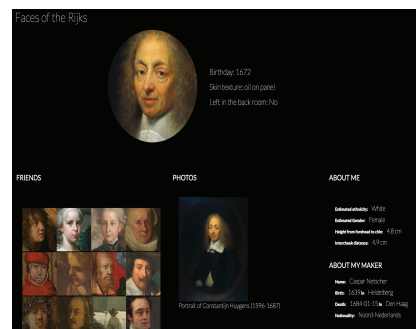


Exhibit 2: Faces of the Rijks

browsing and clicking through their arbitrarily assigned “friends”, the user is brought to pages of other “individuals,” so they can explore the Rijksmuseum’s painting collection through fun and random traversals of its faces.

## Hague School

With the museum’s physical and artistic origins in the Hague, we feature the prominent members of the Hague school, a group of artists who lived and worked in the city between 1860 and 1980, exhibited at the Rijks in this visualization. This exhibit enables users to compare and explore their work through the paintings’ colors and canvas size. We were interested in presenting each painting as a strip of its colors, ordered by hue because the artists’ palettes allegedly transitioned from gloomy and gray to lighter and brighter, under the influence of French Impressionism [9]. However, our visualization did not support this claim. The dimensions, ranging in width from 20 cm to 181 cm and height from 19 cm to 136 cm, are all aligned by their bottom left corners. These two visualizations are connected with interactivity, so users can identify which dimensions pair with which colors and analyze the paintings in a new light.

## Masterpieces

Drawing inspiration from the famous canals of Amsterdam (one of the most recognizable Dutch icons), we wanted to showcase, in a novel way, the museum’s most well-known pieces: a set of sixty paintings curated by the museum itself as masterpieces. We first break down each painting into a set of around 600 pixels. Each of them is then sorted by hue, from red to blue, and gets animated as if it is floating rapidly across the canals in a vector-

-ized map of Amsterdam. It finishes its course on a canvas where the full image of the painting gets progressively revealed. Due to the delays in animation and the breakdown by hue, different features of the pixelated painting get revealed over time, allowing the user to playfully guess which of the masterpieces is getting displayed, before we finally reveal the high definition image along with the name, author and date of the painting.

## Installation

Being a web-based data visualization, we simply require a web-enabled PC/laptop connected to a projector, large monitor or lcd display.

## References

- [1]<https://qz.com/583354/why-is-so-much-of-the-worlds-great-art-in-storage/>
- [2]<http://www.nytimes.com/2013/04/02/arts/design/glories-restored-rijksmuseum-is-reopening-after-10-years.html>
- [3]<https://www.kairos.com/>
- [4]<https://www.google.com/culturalinstitute/beta/>
- [5]<https://www.rijksmuseum.nl/en/api>
- [6]<https://github.com/MuseumofModernArt/collection>
- [7]<https://github.com/tategallery/collection>
- [8]<http://bierro.github.io>
- [9]<https://www.rijksmuseum.nl/en/rijksstudio/styles/the-hague-school>
- [10]<https://fivethirtyeight.com/features/a-nerds-guide-to-the-2229-paintings-at-moma/>
- [11]<http://visualoop.com/blog/83181/portfolio-of-the-week-gabriel-gianordoli>
- [12]<https://www.nextrembrandt.com/>
- [13]<https://localprojects.net/work/cleveland-museum-of-art-gallery-one>
- [14]<http://www.ifweasume.com/2013/11/the-dimensions-of-art.html>

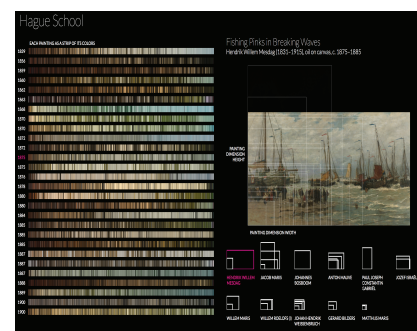


Exhibit 3: Hague School

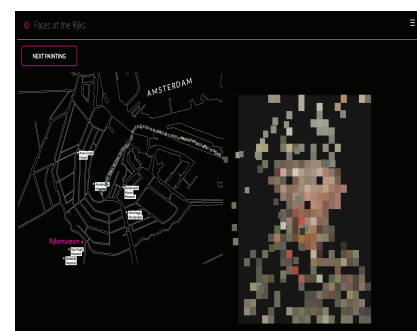


Exhibit 4a: Masterpieces exhibit in progress

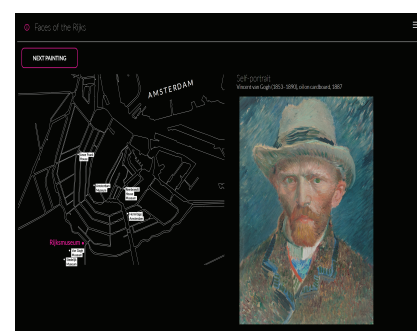


Exhibit 4b: Masterpieces exhibit completed.