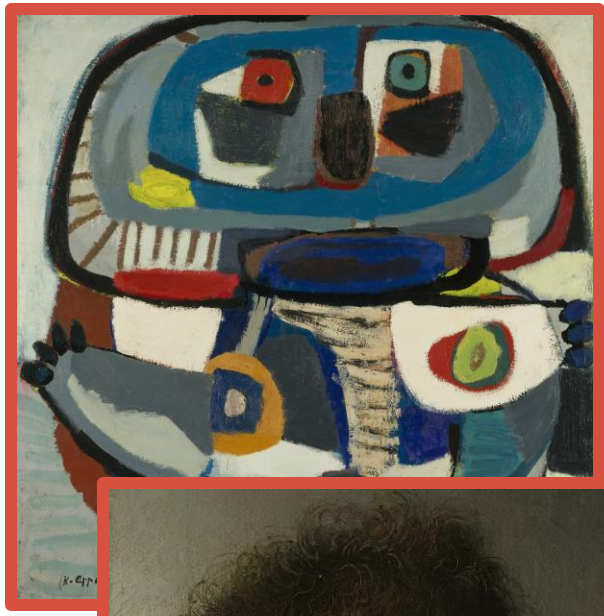
ArtEureka: Summary



Currently, visitors cannot find what they want to see. But it is difficult for museum visitors to know already what they want to see before seeing it.

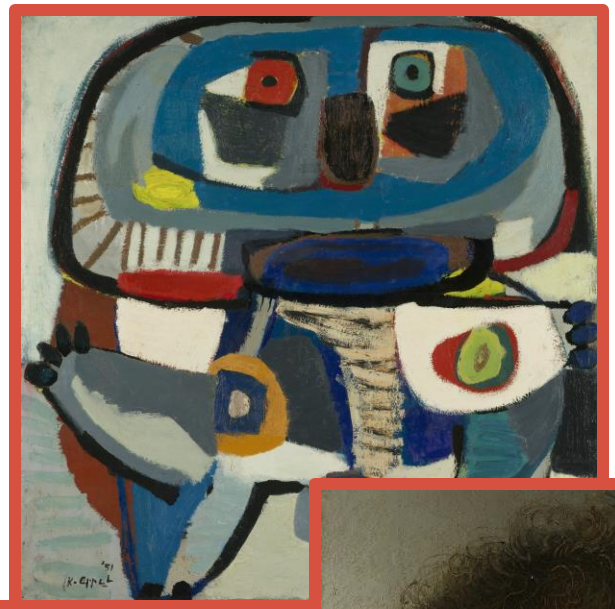
ArtEureka helps the user to find similar but also different paintings to the painting that they like.

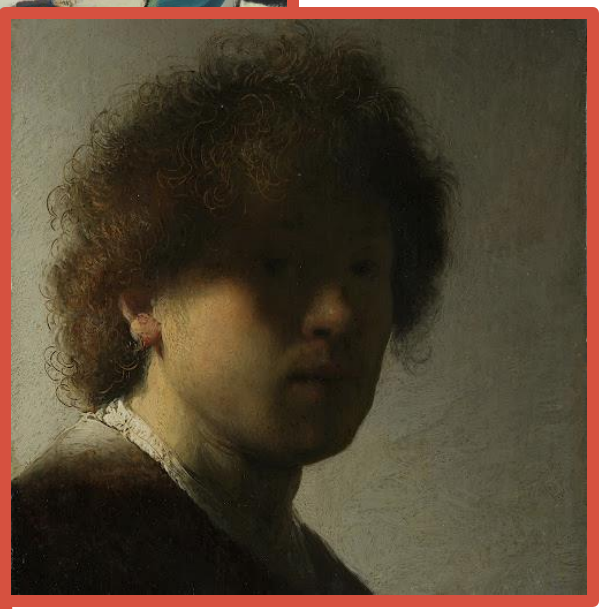
The app is split into two parts: The GUI and the recommender system, which suggests paintings to customers based on the paintings they like.

The Recommender System finds paintings similar and different to a user favorited painting using different distance metrics and a CNN which predicts different types of painting movements.

Users find the recommender system to be useful and agree with the recommended suggestions.

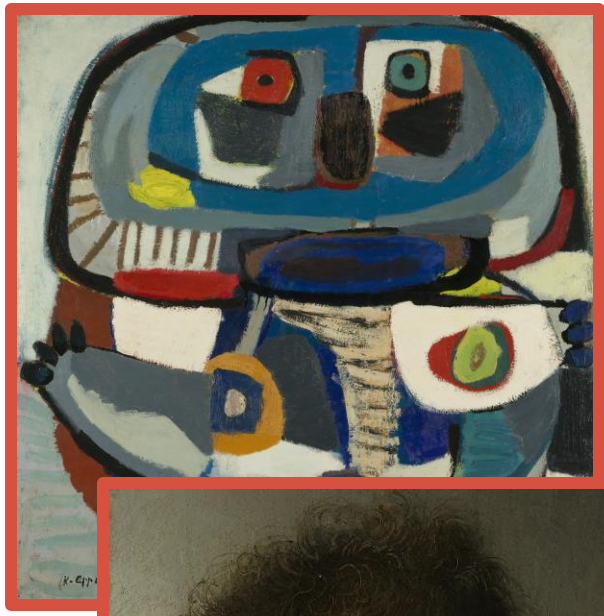
ArtEureka

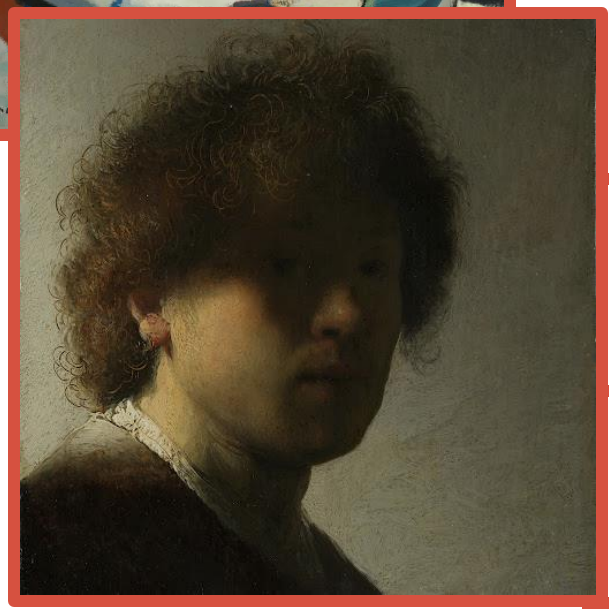




Sinem Ertem, Jan Janiszewski, Luuk Kolstee, Bruno Sotic

Content





The Problem

The Solution

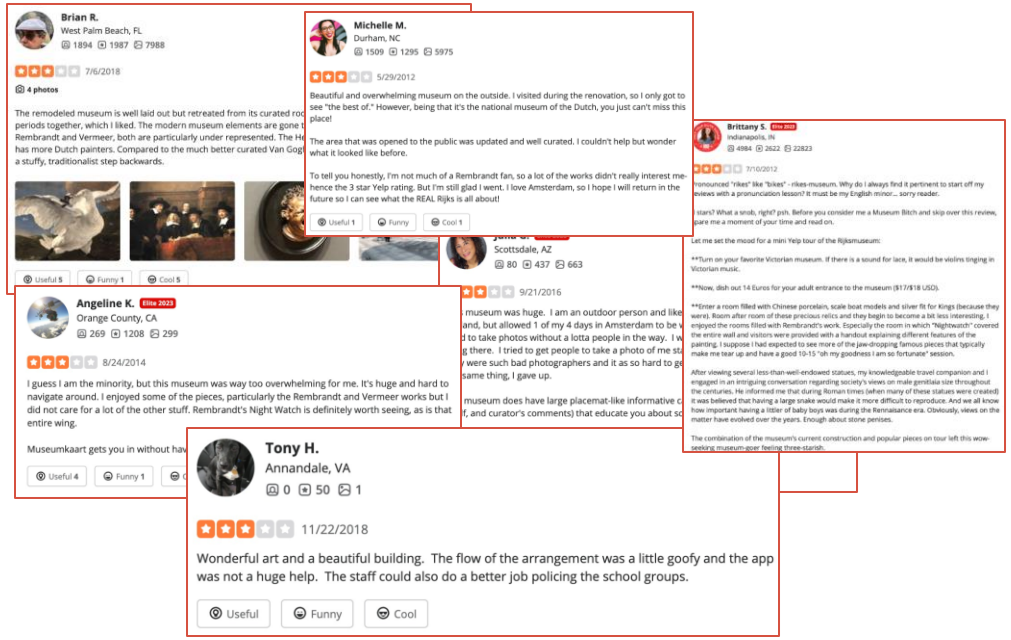
The Demo

The Technology Behind it

The Outcome (Yet Another Demo)

Problem: Future visitors don't know how to find other paintings they like

Example: Museum Reviews

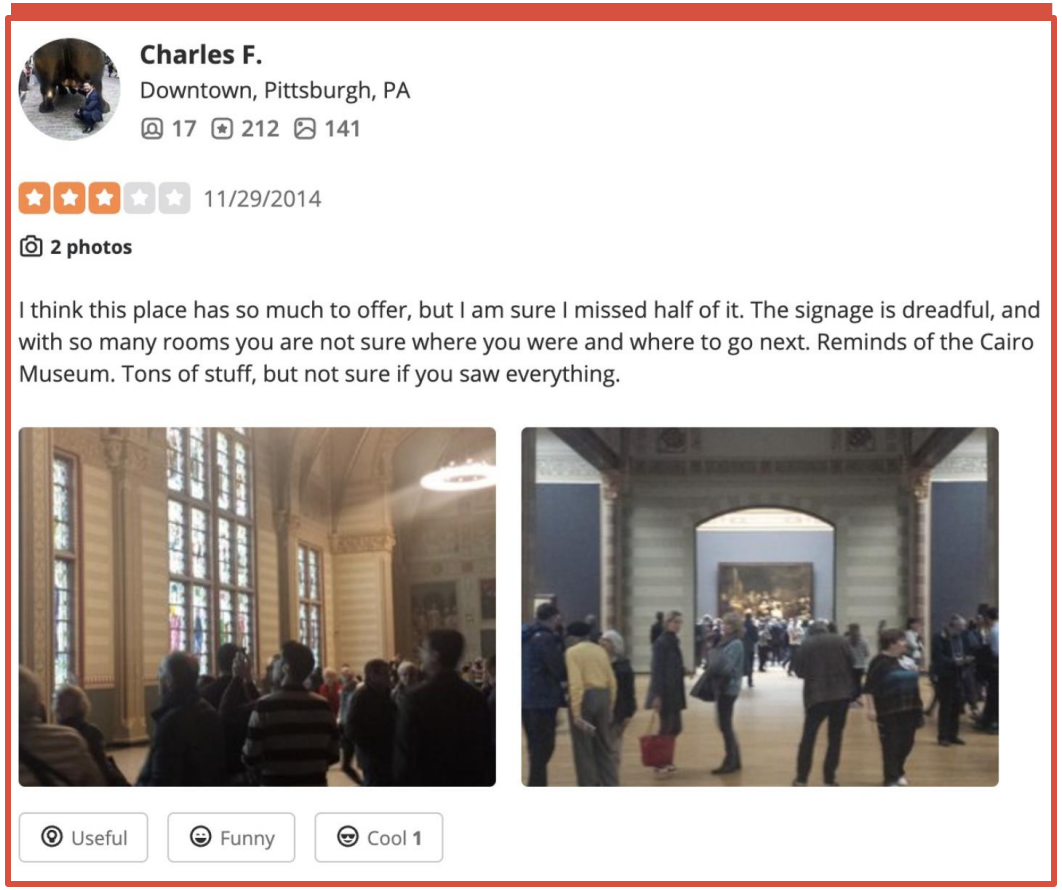


Conclusion

- We **checked** all reviews with **less than 4 stars**
- Recurring problems were related to:
  - Rooms **not structured according to movement/epoch**
  - **Similar paintings** were **difficult to find**
  - There were **too many paintings** overall
- Examples quotes:
  - "The remodeled musem is well laid out but **retreated from its curated rooms that tie artists and periods together**, which I liked."
  - "I am not much of a Rembrandt fan, so **a lot of works didn't really interest me**"
  - "Tons of stuff, but **not sure if you saw everything**"
  - "The **flow** of the arrangement was **a little goofy** and the app was not a huge help."
  - "It's huge and **hard to navigate around**."

We selected one customer to represent the needs of the unhappy reviewers

Brain's museum review



Charles F.
Downtown, Pittsburgh, PA
17 212 141

11/29/2014

2 photos

I think this place has so much to offer, but I am sure I missed half of it. The signage is dreadful, and with so many rooms you are not sure where you were and where to go next. Reminds of the Cairo Museum. Tons of stuff, but not sure if you saw everything.

Useful Funny Cool 1

Brian's persona as envisioned by team

- Charles, 23.
- 'Into art'.
- Visited or is planning to visit the Rijksmuseum.
- Knows some paintings, and would like to broaden his view from there.
- Has a limited level of knowledge of art.
- **Leaves the museum with the feeling that he missed paintings he would have liked to see.**

Problem Statement

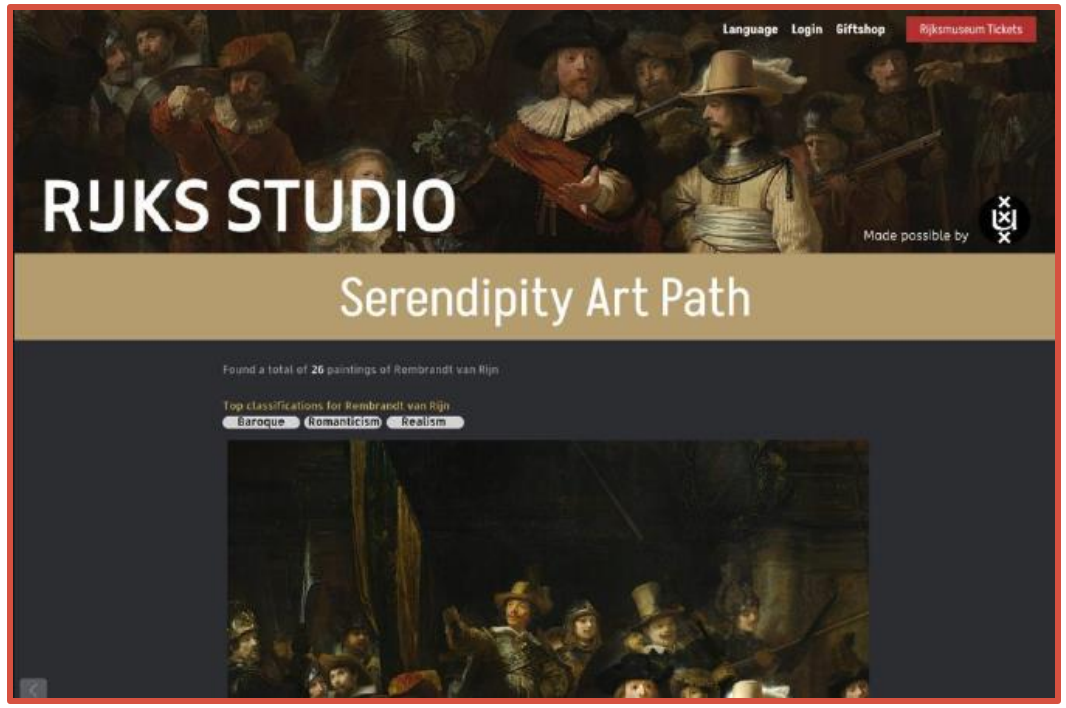
Improving object retrieval and user engagement on the Rijksmuseum online platform

Current Implementation and limitations:

- Search and indexing based on (sparse) metadata.
- A small userbase suggests improvements can be made in user engagement.
- Many users will lack the domain knowledge required to navigate through the collection using key terms.
- No recommendations outside of collections

Our Solution: ArtEureka

The Graphical User Interface on Figma



Description

- Exploration system
  - users can **find similar paintings**
  - provides opportunity to **serendipitously discover art**
- Requires little domain knowledge:
  - *Either:* **Start from a painting** or painter you know.
  - *OR:* **Provide a starting point** to the user.
- Based on:
  - Recommender: visual characteristics (movement/style)
  - Filters: metadata (centuries, artists)

Our Approach: Exploration Through Serendipity

Phrasal Summary of Serendipity Approach

YOU MAY ALSO LIKE...

Description

- Provides a 'fuzzy' solution when users do not exactly know what they are looking for.
- Balance: how do we ensure users do not get locked into a certain direction?
- *"an effective recommendation algorithm should not only recommend what we are likely to appreciate but also suggest* ***random*** *yet* ***objective*** *elements to help keep an open window to other worlds and to new discoveries."*

Figma Prototype Walkthrough

Demo link: https://www.figma.com/proto/oYt3UiabdUnmpI9JBPdVBA/Untitled?node-id=2%3A312&scaling=min-zoom&page-id=0%3A1&starting-point-node-id=2%3A312

User Validation For Figma

Positive Review

- Ease of use
- Filters
- Relevant recommendations

Negative Review

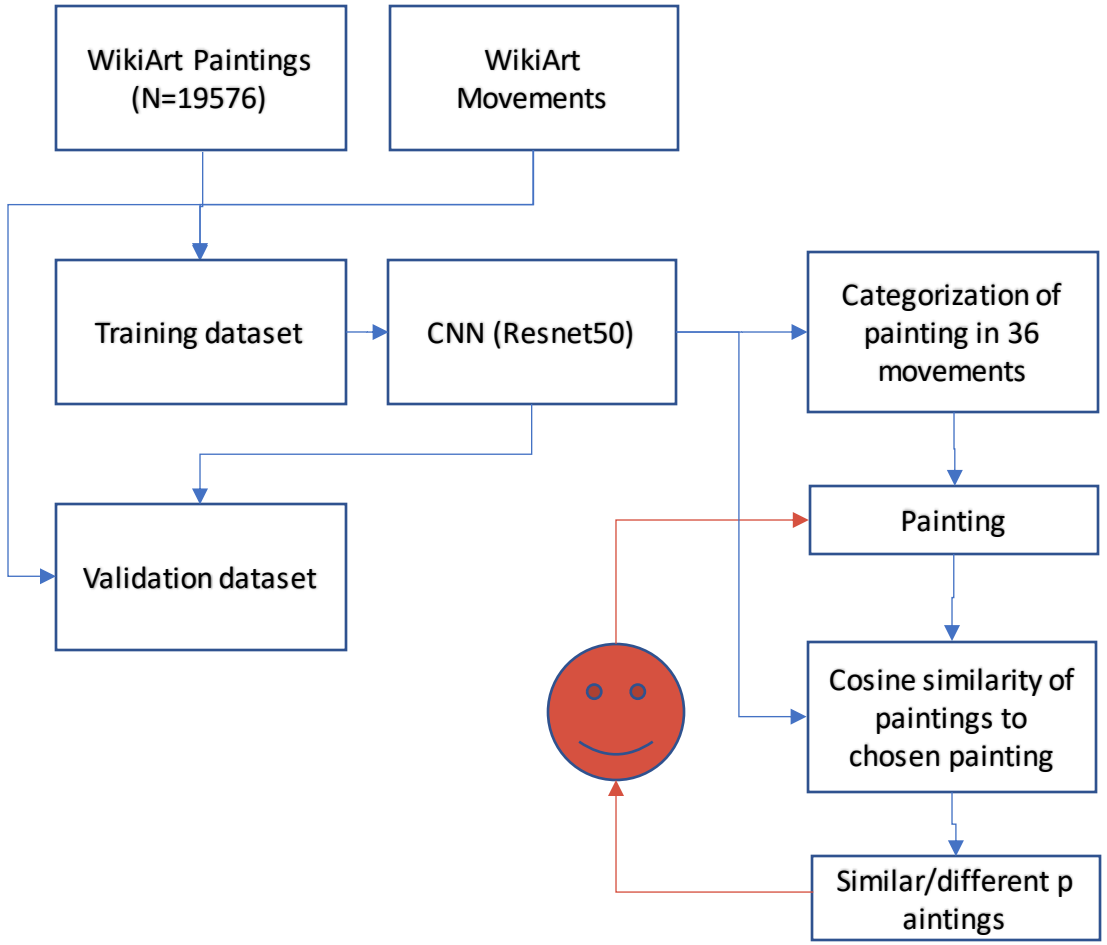
- The 'different' option confuses me
- UI is unintuitive
- Uninviting as I need to actively click around to explore paintings

Demo: Recommender Engine

To be opened on local computer

ArtEureka Recommender Engine Uses Vector Factorization to Suggest Similar Paintings to Visitors

Schematic overview of the recommender engine



Description of recommender engine

- Art movements correspond to underlying, unrecognized criteria (a human-made PCA)
- Engine finds most similar paintings to user chosen painting:
  - Similarity computed on 36 predicted movements (not all movements can be found in the Rijksmuseum)
  - Based on Cosine similarity
- We trained a CNN (Resnet50) to categorize paintings in 36 movements
- Training data was scraped from WikiArt
- Model accuracy in validation set: 40% top1 correct

User Validation For ArtEureka

Positive Review

Recommendations:

- Relevant
- a wider range of paintings available
- Not only 'similar' can be found (Serendipity)

Negative Review

At the beginning I was not sure why I get the following recommendations.

Conclusion and Future Research

Conclusion

- We allowed users to find new, unknown paintings.
- Users are happy with the opportunity.
- Serendipity feature of dissimilarity clashes with user's expectations.

Future Additions

- Streamlining the ability to combine metadata filters and similarity.
- Implement a clearer GUI with a better explanation on why users would want to see "different/dissimilar" paintings (e.g., name them "similar in certain aspects" rather than different).
- General ux work.

Q&A and Prototype Testing