

# Art(NET)work: Visualising interconnected artwork data in VR

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## 1. INTRODUCTION

As the technology progresses, VR becomes more widespread and finds uses outside of gaming. One of these applications is virtual museums (Alatrash et al. 2021). As it has been shown that active participation with art pieces plays an important role in audience experience (Passebois Ducros & Euzéby 2021), virtual museums are gaining popularity all over the world. This makes VR a great tool that is potentially able to increase audience engagement with art, increasing its outreach.

Museums all over the world have launched virtual tours, allowing audiences to wander through

representations of gallery spaces and take a closer look at famous art pieces. In addition to digital representations of real museums, there are also completely digital museums that are accessible only through VR. However, these completely virtual museums rarely take advantage of their freedom from the restrictions of the physical world.

Harnessing the potential of VR in this domain, we present Art(NET)work: an application able to visualise data in an interactive and immersive manner that can provide a much richer and more intuitive understanding of the data (Figure 1).



Figure 1: View from inside the Art(NET)work.

## 2. DATASET

For this demonstration of our data visualisation approach in VR, we are using the Open Dataset from the National Gallery of Art (Washington, DC) (National Gallery of Art 2021). It contains more than 130,000 artworks, however for this project, we focus our attention on the 'painting' category, which has 3767 entries (Figure 2).

In addition to images of the paintings, we make use of the following attributes, provided by the dataset: artist name, artist country, year, medium, and dimensions. Each of these attributes can be used to sort and filter the artworks within the VR gallery.

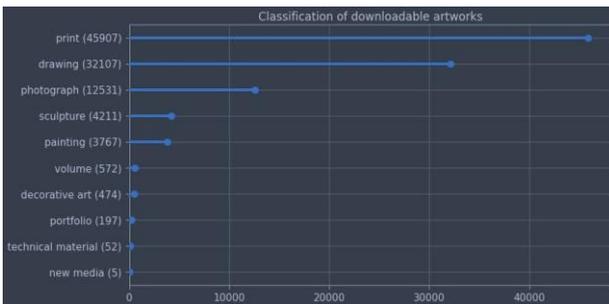


Figure 2: Classification of artworks from dataset.



Figure 3: Art(NET)work presents artworks as nodes, where similar groupings are provided by elastic forces.

## 3. VR APPLICATION

This VR application's goal is to provide a different way to explore famous artworks and investigate various properties (author, year, medium) and connections between them, which may give insights not currently available. Once inside the Art(NET)work the user can explore the environment by moving around. The user also has the ability to expand any of the nodes to view the full painting.

This application presents data as a graph network where each node represents a painting (Figure 3). The connections between the nodes simulate an elastic force proportional to the similarity of the artworks. These attraction forces are counteracted by a magnetic repulsive force. As a result, the user may expect the nodes that are physically close to each other to share one or more properties.

## 4. SUMMARY

Art(NET)work is a prototype application, providing an interactive visualisation of artwork data in VR. This is an ongoing project and it is anticipated that new parameters will be added to manipulate the connection between artworks in the future. Improvements to the user interface may also be made following user testing and feedback, which is currently ongoing. It is intended that this project will help to forge new approaches for visualising artwork data, and the data visualisation framework being explored is also generalisable, as it could be applied to other sources of data.

## 5. REFERENCES

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Passebois Ducros, J. and Euzéby, F. (2021) "Investigating Consumer Experience in Hybrid Museums: A Netnographic Study." *Qualitative Market Research*, vol.24, no.2, 22 Mar. 2021, pp. 180–199.