

Final project documentation

Group VR/AR/XT

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- The visualisations presented in the Final project presentation
- Links to the used data for each visualisation (*if you compiled your own dataset, or combined multiple datasets, present them in an accessible place e.g. on Google Drive / OneDrive, while still making sure that you credit all your sources correctly*)
- Please note which visualisations are interactive in the document

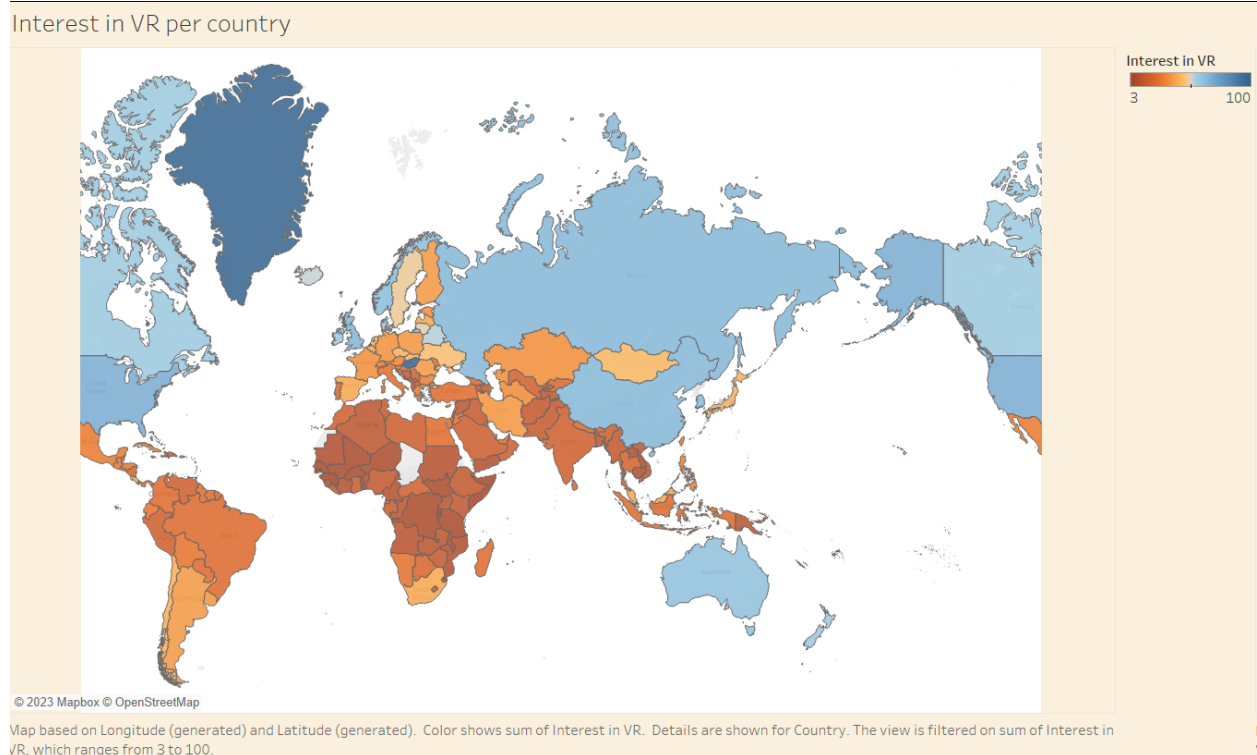
VR in the past and released headsets

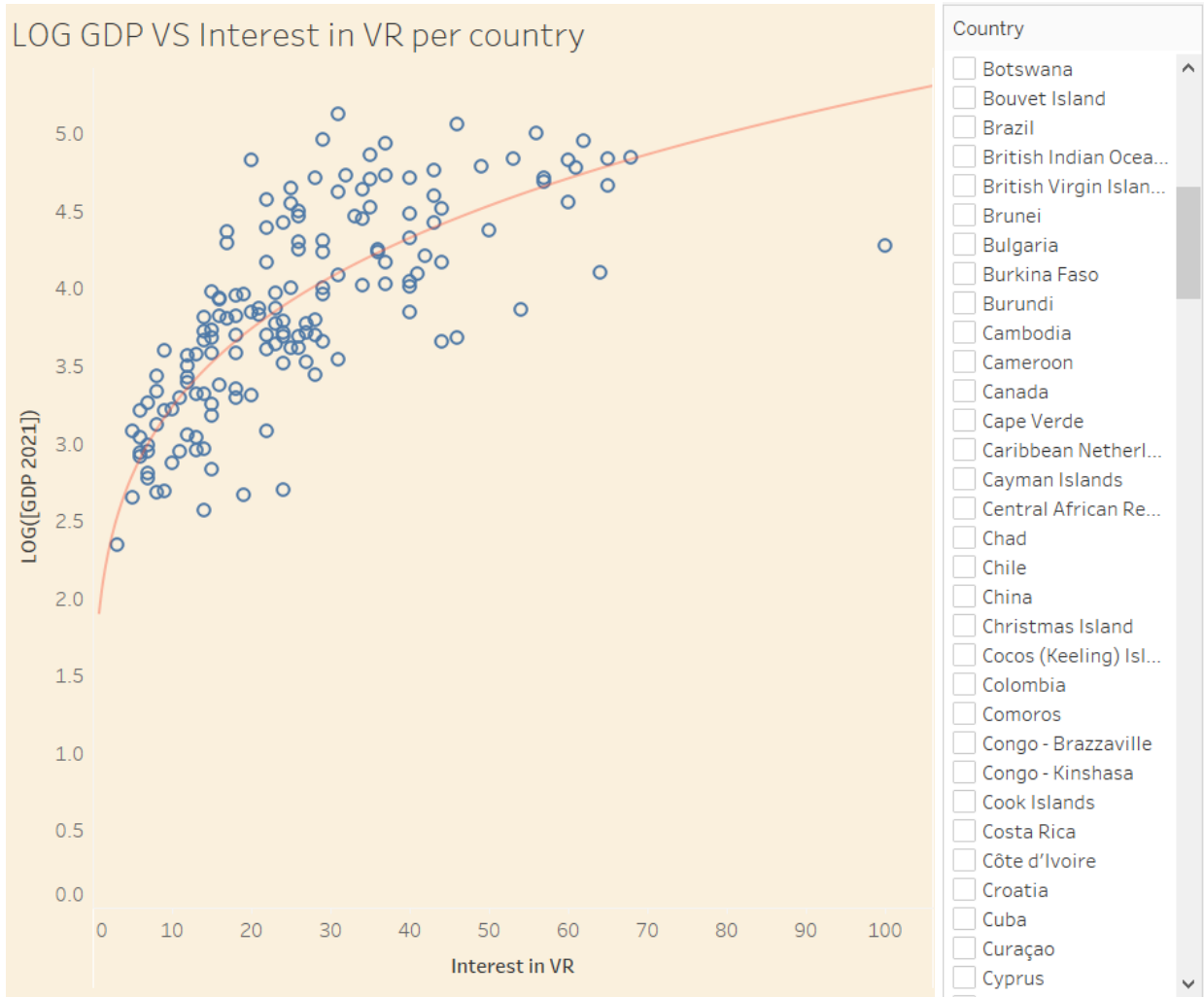
https://trends.google.nl/trends/explore?date=today%205-y&gprop=youtube&q=%2Fm%2F07_ny&hl=en -> interest in VR

<https://vr.space/news/equipment/vr-headsets-throughout-history/>
<https://docs.google.com/spreadsheets/d/1KCf64R3l2DDqZxncrw-u-GW9oTgiscGzJ5UwTAmilF4/edit?usp=sharing> -> the data in a spreadsheet from the website above.

<https://drive.google.com/drive/folders/1QagWpwqNB7iASlhPYMJdg7V4XgO3szoX> -> GDP per country data set from the individual assignment

https://drive.google.com/file/d/140x5O6FmMfiELn9RAYe3jd_y6Q51E10v/view?usp=sharing -> link to the animation of VR headsets over time



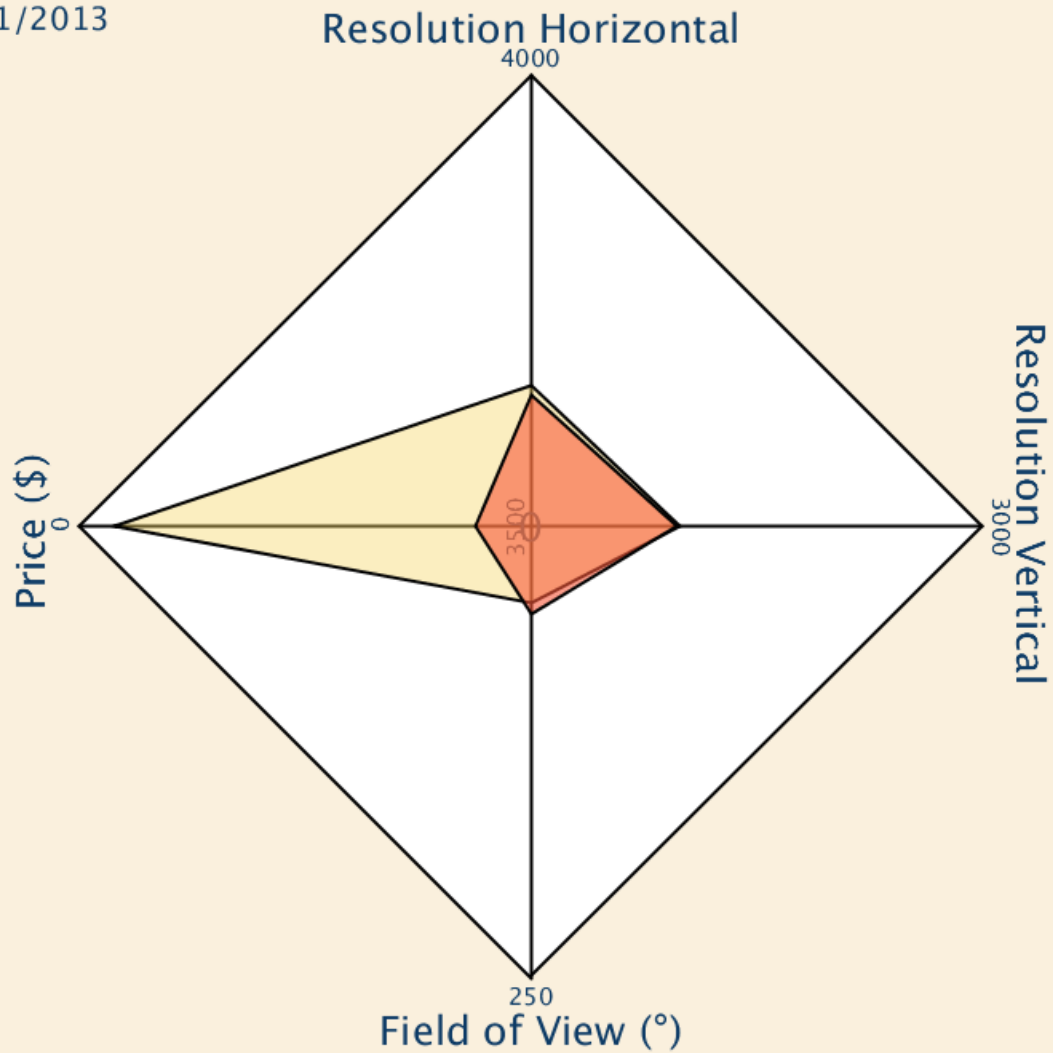


You can filter on the country.

RELEASED VR HEADSETS WITH THEIR FEATURES

Oculus Rift DK1

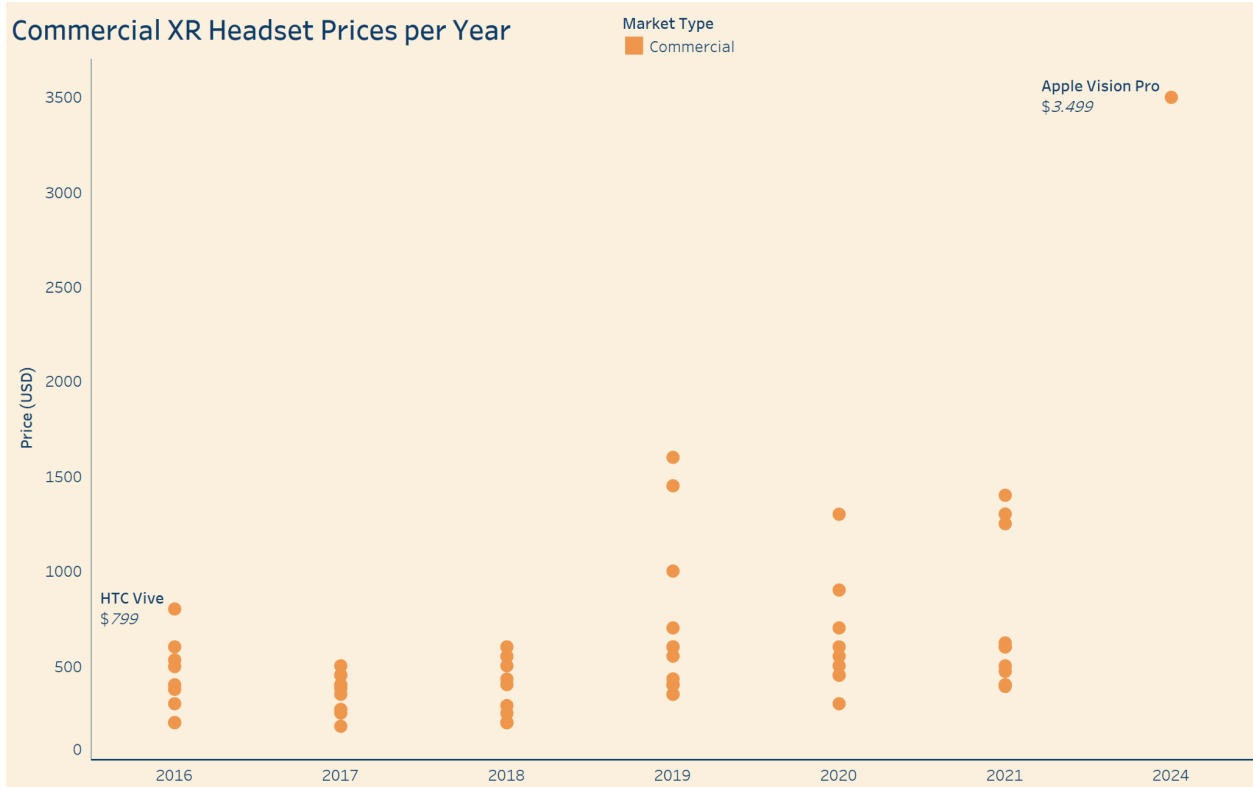
3/1/2013



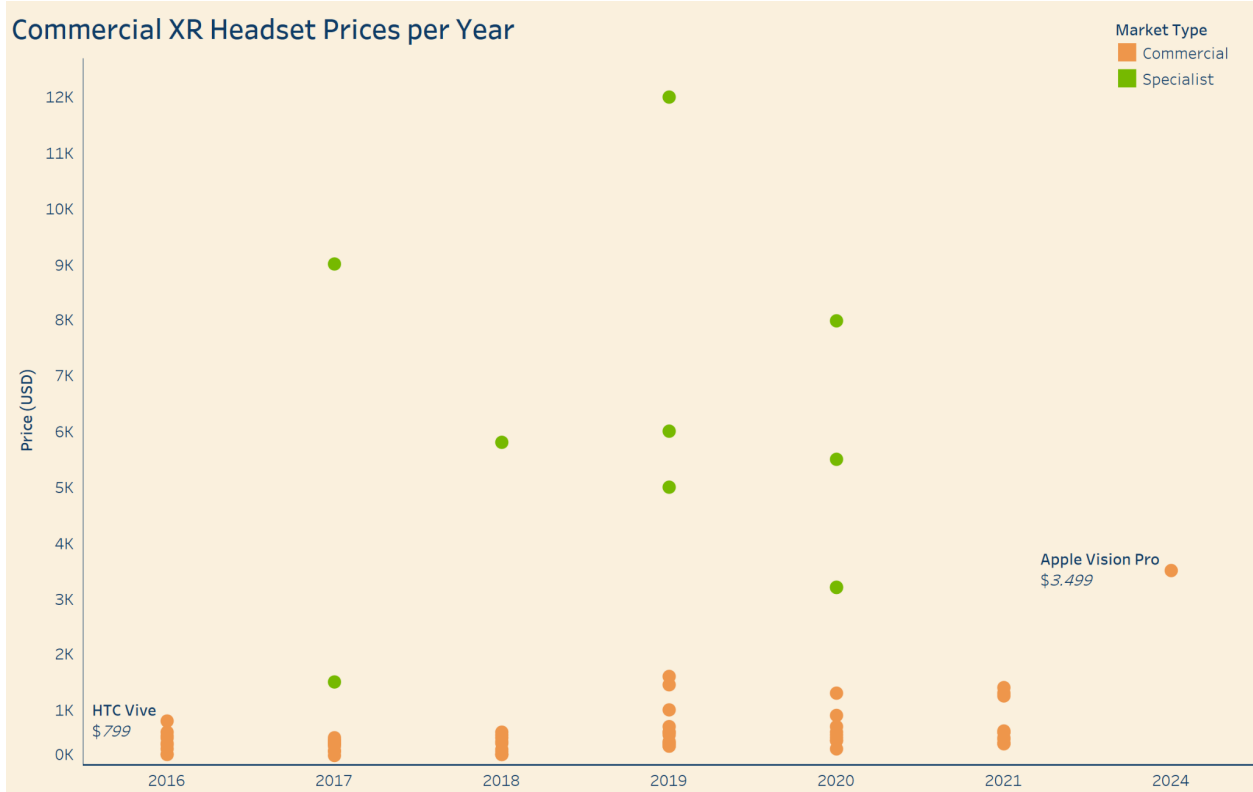
The lowest price is on the left to show the bigger the shape the better.
There are also a few headsets exceeding the \$3500, which will go to the maximum.

The released VR headsets visualization is an animation of all headsets over time with the shapes changing per headset. The video link is with the links to the used data

Price and Investments in XR

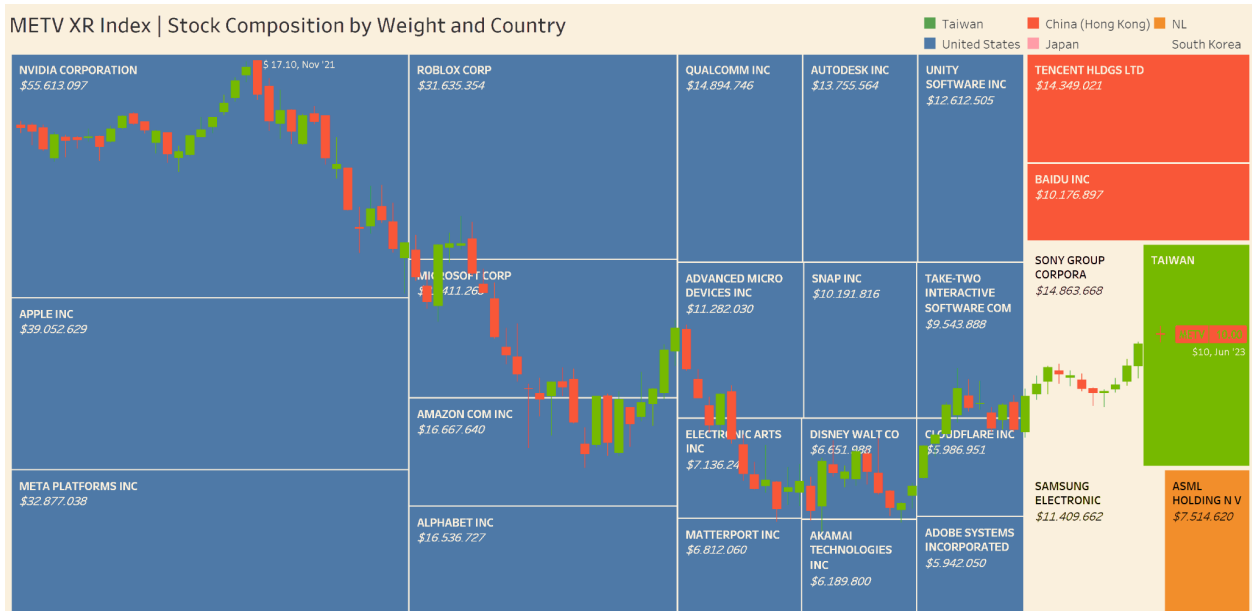
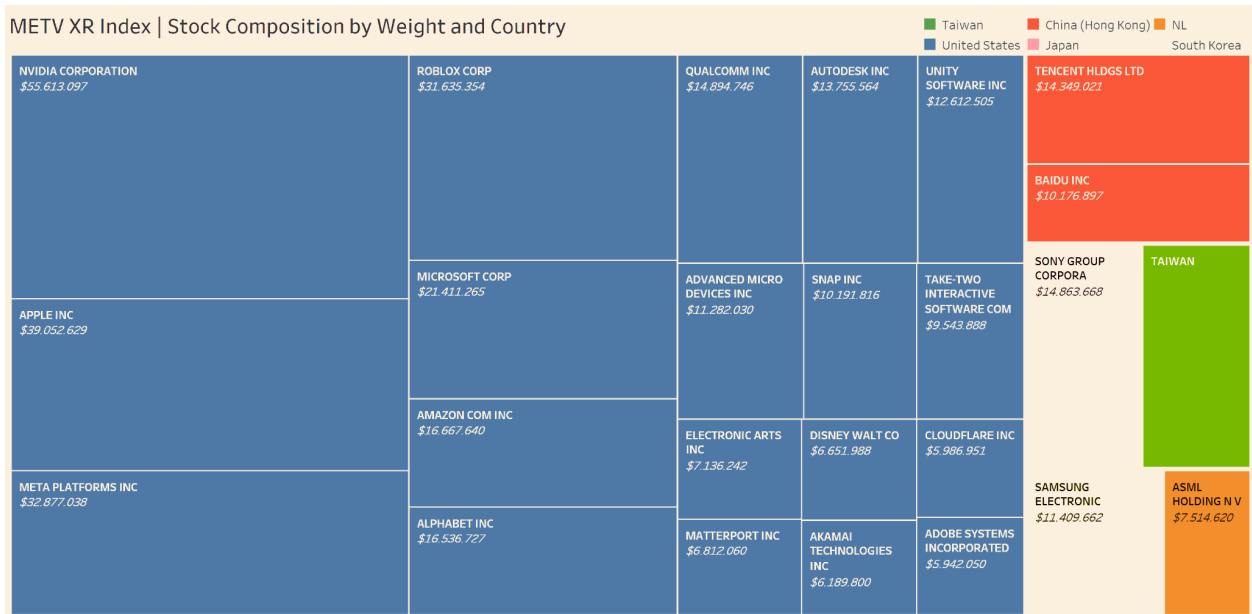


(*'Specialized' filtered in Tableau*)



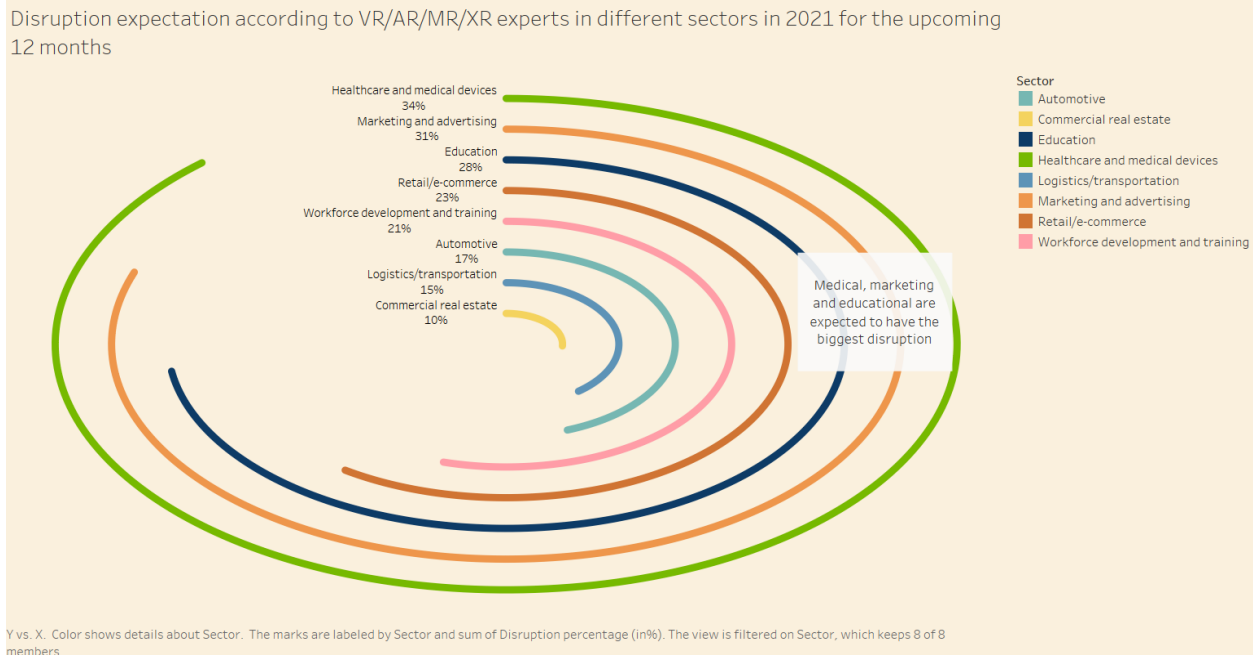
Pre-2015 filtered, categorization by self-described use cases by producer of the relevant products.

Data: subset of <https://vr.space/news/equipment/vr-headsets-throughout-history/>



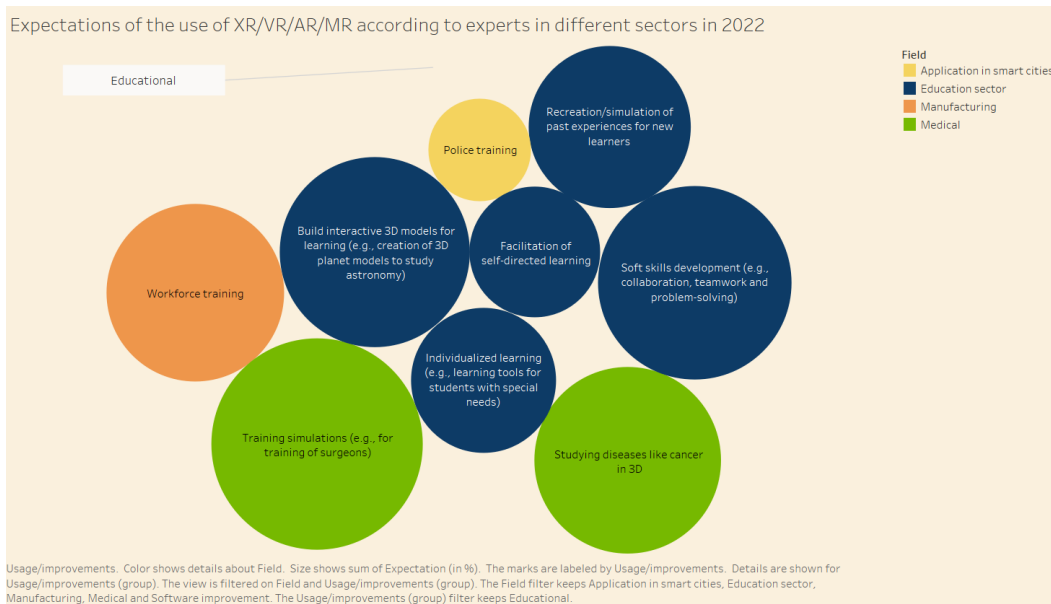
<https://www.roundhillinvestments.com/etf/metv/full-holdings> +
<https://www.tradingview.com/chart/6KBQpFQO/?symbol=METV>

Future expectation of experts in the VR/XR/AR working area



This can be filtered on which sector you want to portray. The data that is used for this graph can be found here:

<https://www.statista.com/statistics/1185060/sectors-disrupted-immersive-technology-xr-ar-vr-mr/>

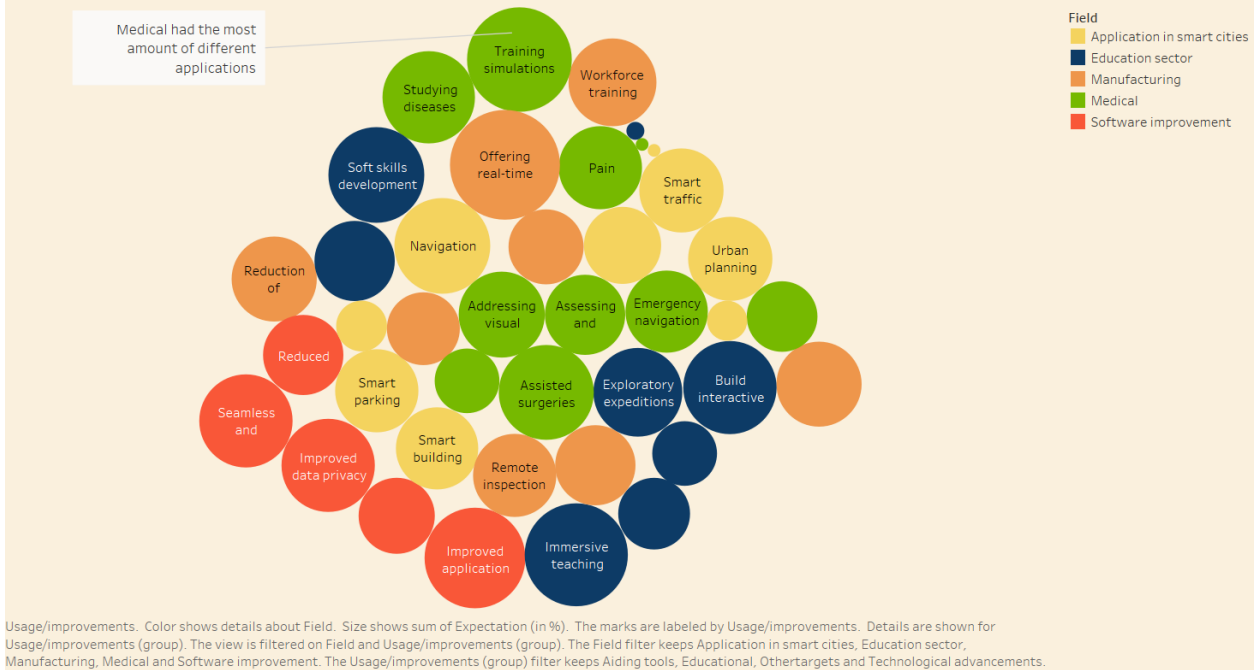


Expectations of the use of XR/VR/AR/MR according to experts in different sectors in 2022



Usage/improvements. Color shows details about Field. Size shows sum of Expectation (in %). The marks are labeled by Usage/improvements. Details are shown for Usage/improvements (group). The view is filtered on Field and Usage/improvements (group). The Field filter keeps Application in smart cities, Education sector, Manufacturing, Medical and Software improvement. The Usage/improvements (group) filter keeps Aiding tools.

Expectations of the use of XR/VR/AR/MR according to experts in different sectors in 2022



Expectations of the use of XR/VR/AR/MR according to experts in different sectors in 2022

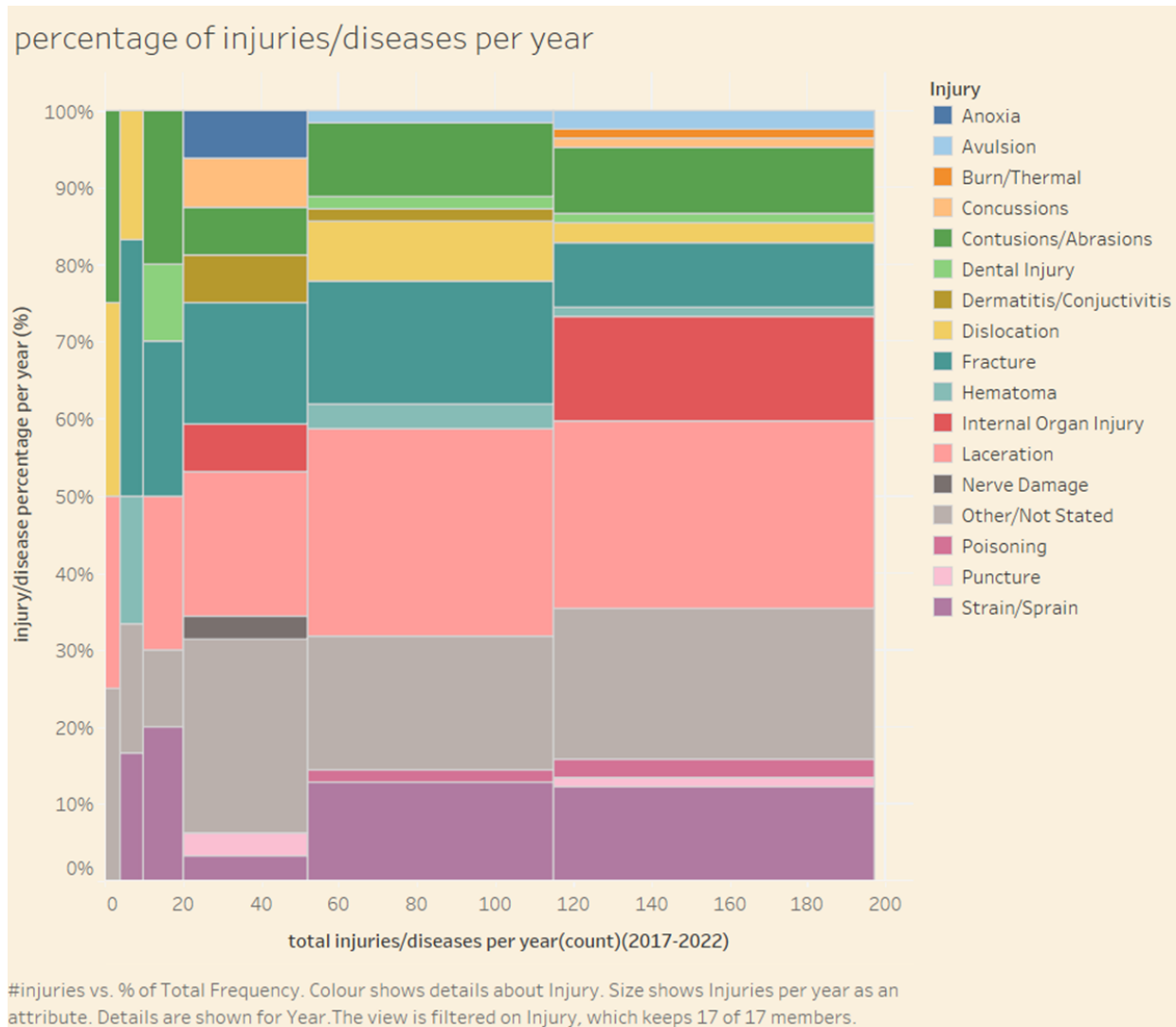


You can filter the bubbles on which field they are representing and what kind of use the activity represents. The data that was used for this graph can be retrieved from the following links:

- <https://www.statista.com/statistics/1185244/applications-immersive-technologies-xr-ar-vr-mr-smart-cities/>
- <https://www.statista.com/statistics/1185066/applications-immersive-technologies-xr-ar-vr-mr-healthcare/>

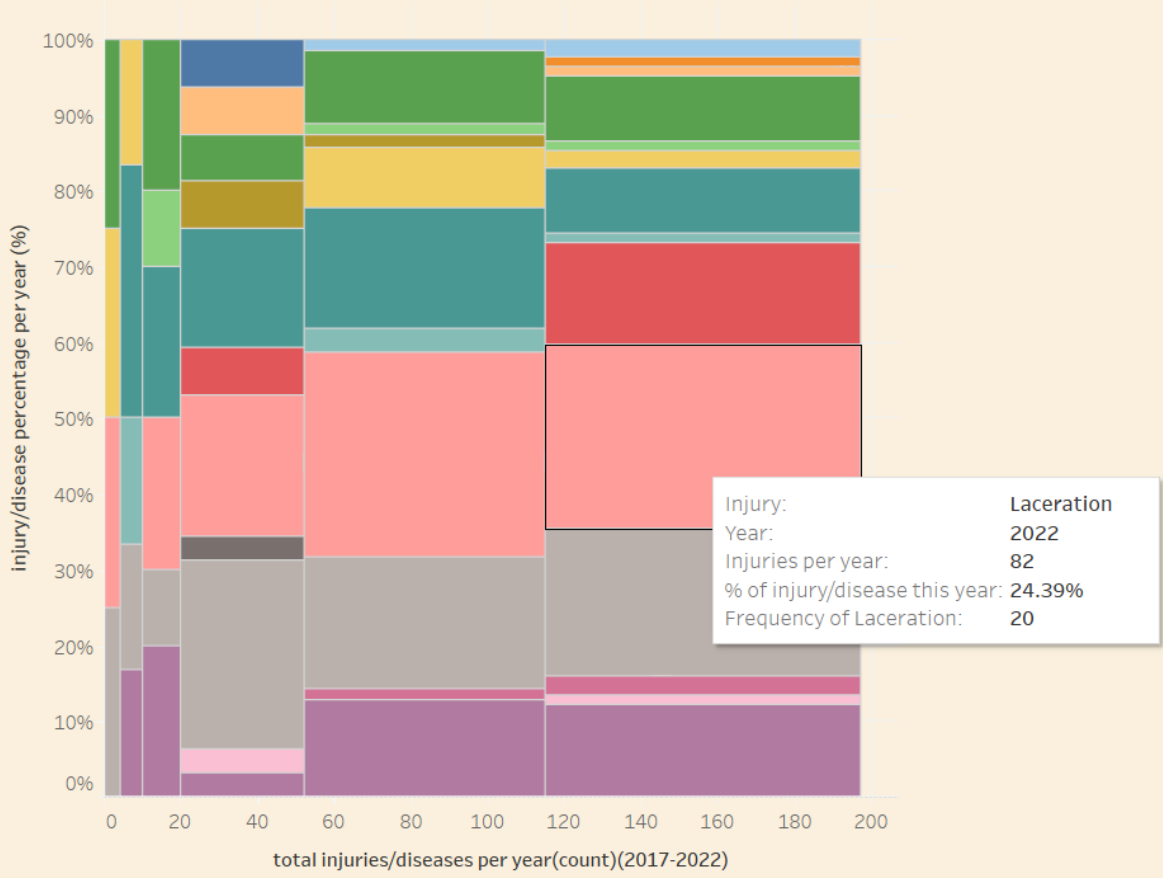
- <https://www.statista.com/statistics/1185078/applications-immersive-technologies-xr-ar-vr-mr-education/>
- <https://www.statista.com/statistics/1185073/applications-immersive-technologies-xr-ar-vr-mr-manufacturing/>
- <https://www.statista.com/statistics/1185342/top-improvements-xr-ar-vr-mr-software/>

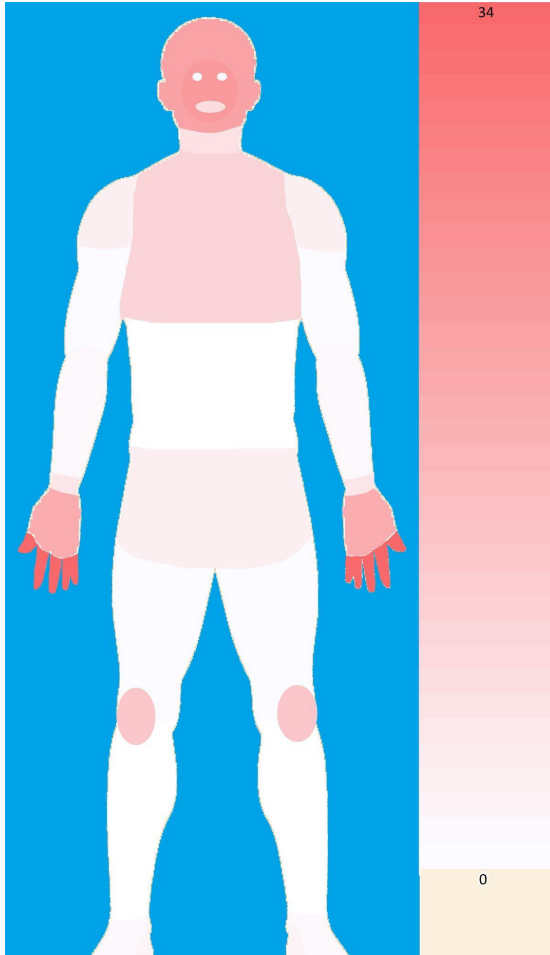
injuries /diseases related to VR



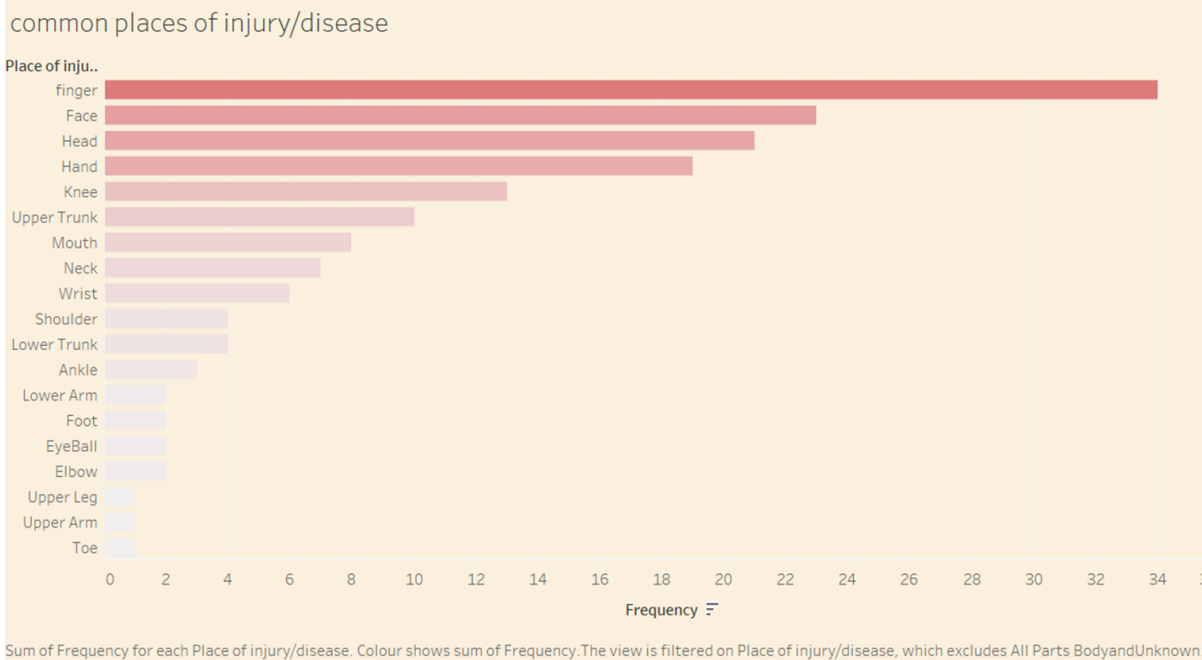
(interactive: filter + information on hover)

percentage of injuries/diseases per year





https://www.freepik.com/free-vector/human-anatomy-white-background_18921080.htm#query=human%20body&position=1&from_view=keyword&track=ais
 Base human image (white) by brgfx on freepik



Data used:

https://drive.google.com/drive/folders/1cC_bIqMHUYRh4BJpUtE5ar9r9w0sT6FW?usp=sharing

VR Steam market

Data & Code

Code has been edited over time , so things are commented out to get different effects.

<https://drive.google.com/drive/folders/1OUZ32OYwFQ-fjBYiZxOEVAd1sBP9ErBA?usp=sharing>

Method

1.data collection

Write python script that goes through all steam games with the VR ONLY category on steam. This was done by downloading the html of a steam search page with all games opened.

In the html we can find the name,price,release date, and a link to the steam page. A request to the link gives data for review count review grade and tags

From this 2 csv were created: **game_data.csv** and **tags.csv**

2. Extra data processing

For the T-SNE some extra processing had to be done. The normalization of the tag data. The idea was to make for each game and tag a combination. If the game had a tag, it would be 1, if not 0.

An example row would be [Game name,1,0,0,0,0,1,1,0,1,0,], but then as many numbers as there are tags.

From this **tags_normalized.csv** was created.

3. T-SNE

Using the normalized data and the sklearn library in python. Performing the tsne was just calling the TSNE function and giving the output dimension wanted.

```
tsne = TSNE(n_components=3, verbose=1, perplexity=40, n_iter=300)
tsne_results = tsne.fit_transform(df.values.T)
```

On the base data also a nearest neighbor clustering was used. But in retrospect different types of clustering might have been more truthful to the data, like kmeans.

This data got exported to **T-SNE_clustered** and **T-SNE_clustered_3d**

There were some mistakes made that created extra columns and required some hand stitching in excel.

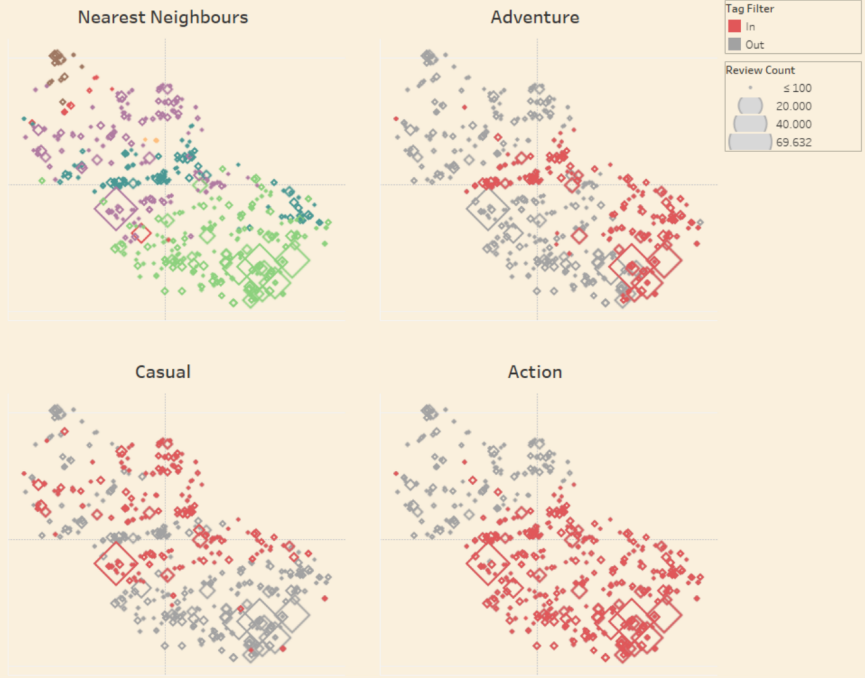
Vis 1: Tableau and game_data.csv



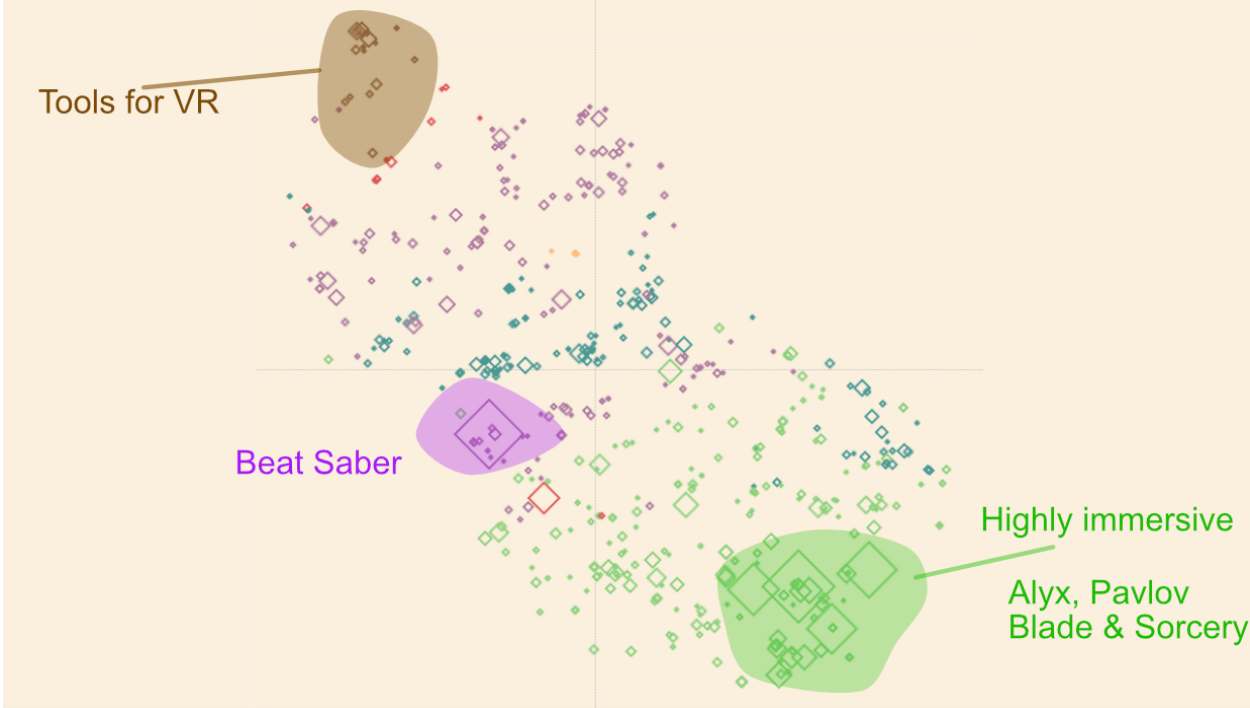
Vis 2_1: Tableau and T-SNE_clustered.csv and tags.csv and game_data.csv

Map of VR Games on Steam made with T-SNE

- VR
- Puzzle
- Adventure
- Sci-fi
- Exploration
- Mystery
- Atmospheric
- Story Rich
- Great Soundtrack
- Cold War
- Action-Adventure
- Horror
- Singleplayer
- Indie
- Casual
- Walking Simulator
- Immersive Sim
- 3D
- Beautiful
- Cinematic



Vis 2_2: Tableau and T-SNE_clustered.csv and game_data.csv



Vis 2_3: Unity and T-SNE_clustered_3d made and game_data.csv

