Image Analysis with ImageJ and Memespector GUI: Studying TikTok Vernaculars | E. Pilipets

DOWNLOAD AND INSTALL IMAGE PLOT

1. Install the current version of [Java](#)

2. Download [ImageJ](#) (alternatively use browser version [here](#) (not very stable)

INSTALL & USE TIKTOK SCRAPER

1. Install the current version of [Node.js](#)

2. Open Terminal

3. Open https://github.com/drawrowfly/tiktok-scraper

4. Run `sudo npm install -g npm@8.12.1` to install the scraper from NPM

5. Run `sudo npm i -g tiktok-scraper` in your Terminal to install the scraper

```
elpilipe@lap46-mk ~ % sudo npm i -g tiktok-scraper
Password:
```

6. Enter your password

7. To check the options, consult https://github.com/drawrowfly/tiktok-scraper USAGE

8. Note that some requests might have been deprecated

9. E.g., to scrape _10_ videos + metadata from a hashtag query, type this command

```
tiktok-scraper hashtag boredinthehouse -n 10 -d -z -t all
```

10. The output .zip (video files) .csv (spreadsheet file with metadata) + .json should look like

```
Last login: Tue Jan 25 18:25:40 on ttys000
[Downloading (WITH WM) 6800471860761971974 [==============================] 100%
 Downloading (WITH WM) 6809702648296639750 [==============================] 100%
 Downloading (WITH WM) 6846097184811748613 [==============================] 100%
 Downloading (WITH WM) 6809482418999938310 [==============================] 100%
 Downloading (WITH WM) 6822703668660407557 [==============================] 100%
 Downloading (WITH WM) 6953721118016457989 [==============================] 100%
 Downloading (WITH WM) 6830446916208184582 [==============================] 100%
 Downloading (WITH WM) 6813091117651807494 [==============================] 100%
 Downloading (WITH WM) 6887574036616908038 [==============================] 100%
 Downloading (WITH WM) 6813803129138580742 [==============================] 100%
ZIP path: /Users/elpilipe/boredinthehouse_1643132902875.zip
JSON path: /Users/elpilipe/boredinthehouse_1643132902875.json
CSV path: /Users/elpilipe/boredinthehouse_1643132902875.csv
elpilipe@lap46-mk ~ %
```
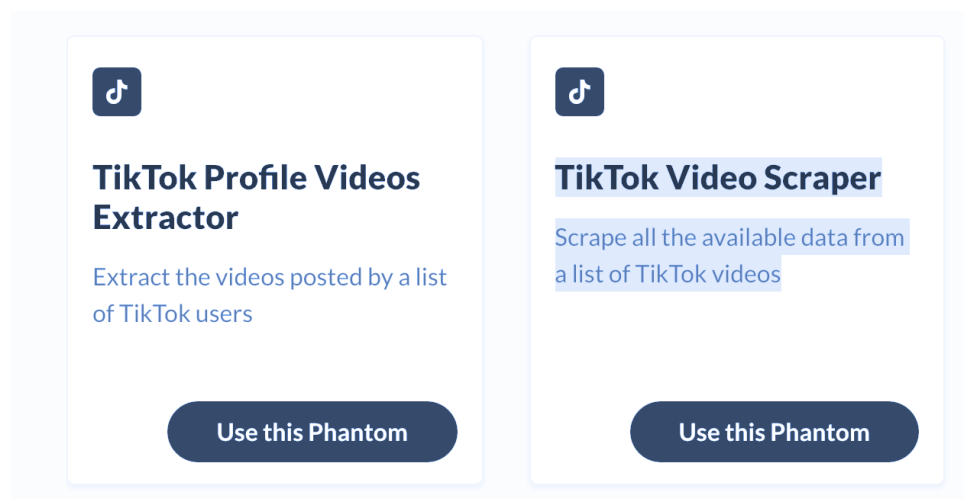
11. To scrape _all_ videos + metadata from a hashtag query, type this command

```
tiktok-scraper hashtag boredinthehouse -n 0 -d -z -t all
```

12. Try _not_ to use all too popular hashtags such as #fyp

13. To get help, type `tiktok-scraper --help`

14. Alternatively, use Phantombuster TikTok phantoms to extract data

TikTok Profile Videos Extractor

Extract the videos posted by a list of TikTok users

Use this Phantom

TikTok Video Scraper

Scrape all the available data from a list of TikTok videos

Use this Phantom

DOWNLOAD IMAGES FROM A LIST OF TIKTOK VIDEO THUMBNAILS

1. Install [Downthemall](#) extension in Google Chrome

2. Import and open the scraper output (.csv file) in Google Drive

3. Arrange your data in a preferred order using _Sort Sheet from A to Z_ (e.g., by the time of posting using the column "createtime"). Use the [Epoch Batch Conversion Tool](#) to convert timestamps to 'human time' if needed. Find the column containing image URLs ("covers.default" or "covers.origin" for TikTok). Copy and paste image URLs into a .txt file (use a simple text editor, format the file in Format -> Use plain text before pasting the data). Save this text file in a local folder.

4. Open Downthemall Manager

5. Right-click in the empty field -> IMPORT FROM FILE

6. Import the text file you just created to open "DownThemAll - Select your Downloads"

7. Opt for "all files"

8. Specify the mask to download the images in numeric order by typing *idx*.*ext*

9. Click "Download"

10. Find the images downloaded to a local folder in "Downloads" (by default)

11. You will need this folder to work with ImageJ

12. In DownThemAll Manager, right-click & select _Remove download_

13. Create a new column in the spreadsheet file and name it e.g., image_num_time

14. Select all images from the folder, copy the file names and paste in the spreadsheet

15. Watch this YouTube tutorial if you use Windows (on Mac, just copy & paste)

16. The result is a column with the image filenames

17. You will need this column to work with ImageJ

USING IMAGEJ: IMAGE PLOT AND IMAGE MONTAGE MACROS

Running Image Measurements (hue, saturation, brightness) and preparing the .tsv file

1. Open ImageJ -> Plugins ->Macros ->Run

2. Select the folder ImagePlot Master -> ImageMeasure.txt ->Open

3. Select the folder of images you want to analyze ->Open ->

4. A measurements.txt file will be saved in the same folder

5. Rename measurements.txt in measurements.tab

6. Return to the .csv file containing image URLs + metadata in Google Spreadsheets

7. Add new sheet by clicking + in the bottom left corner

8. Import measurements.tab by opting for File->Import->Upload->Drag&Drop

9. Replace current sheet -> import data

10. Make sure that the numeric order of the image column is correct

11. Copy the column filename to a new column and rename it in e.g., image_num_time

12. Delete the .jpg ending of the image file names by using Find & Replace

13. Rearrange the data in numeric order by sorting the column from A to Z

14. Copy paste the columns timestamp and digg_count next to the measurements

15. Download the sheet as .tsv file and save the file in the image order

Plotting the images with ImagePlot.txt according to the time of posting and visual style

16. Open ImageJ -> Plugins ->Macros ->Run

17. Select the folder ImagePlot Master -> ImagePlot.txt ->Open

18. Opt out of "polar", select Options in the ImagePlot menu and click OK

19. Select the .tsv file with image measurements and metadata you just created -> Open

20. Select the folder of images -> Open

21. Choose data columns from the dropdown menu as follows

ImagePlot: Data column mapping

Choose data columns to use for rendering visualization:

Image filename	filename (Column2)
X axis	createTime (Column0)
Y axis	hue_median (Column8)

Cancel   OK
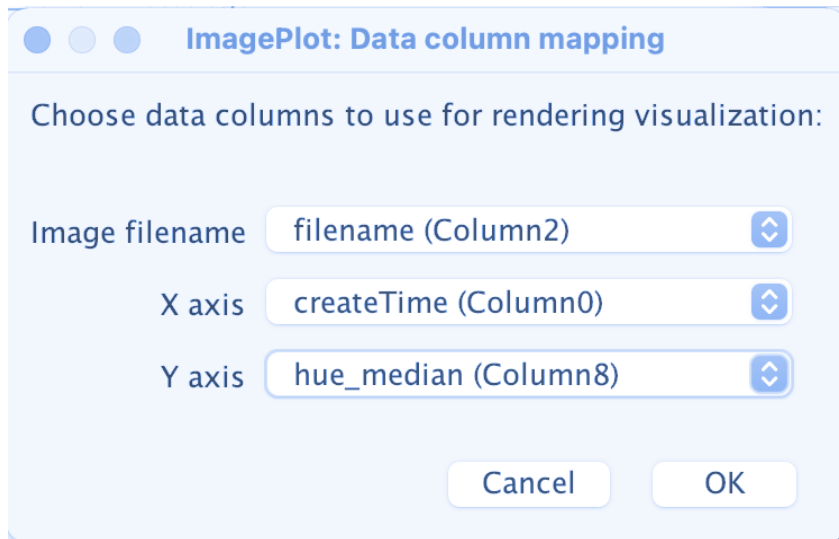
22. Select options to configure: canvas and images

Options

Select options to configure:

- ☑ Canvas
- ☐ Points
- ☐ Lines
- ☐ Labels
- ☑ Images
- ☐ Axis
- ☐ Range

Cancel   OK

23. Set the canvas size and background color as follows

ImagePlot: Canvas

Set the canvas size, border inset,
and background color.

Canvas width 1920 px
Canvas height 1080 px
Border size 80 px

Background R ⬤ 255
G ⬤ 255
B ⬤ 255

Cancel   OK
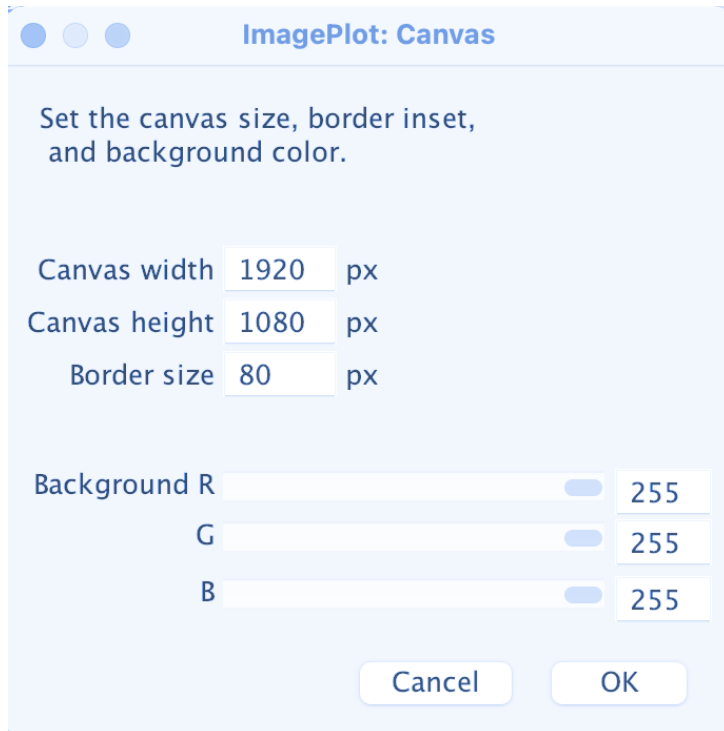
24. Format the size of image thumbnails as follows

ImagePlot: Images

Format the size, appearance, and color
of images and image frames.

Images:
Thumbnail width 30 px
Color RGB ⬍

☐ Blend (transparent)
☑ Smooth Resize

☐ Image frames
Frame width 10 px
R ⬤ 192
G ⬤ 192
B ⬤ 192

Cancel   OK

25. Visualize & Analyze (see the slides)

1_timestamp_hue_correct.png (50%)

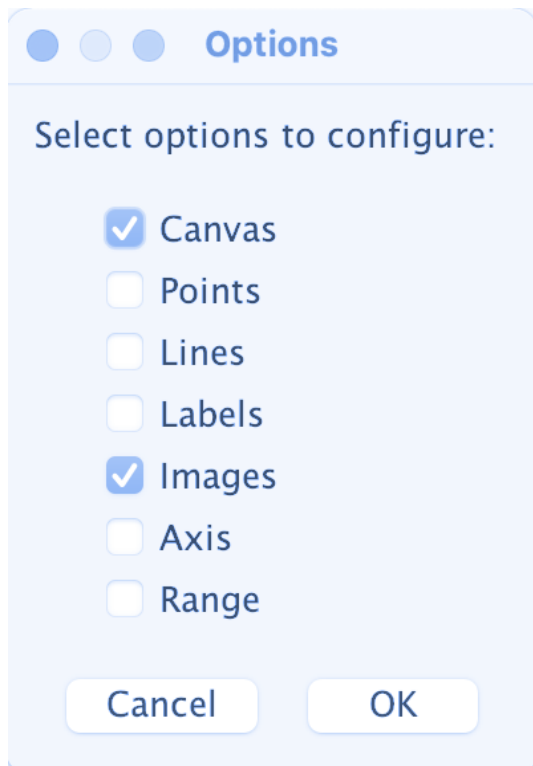1920x1080 pixels; RGB; 7.9MB
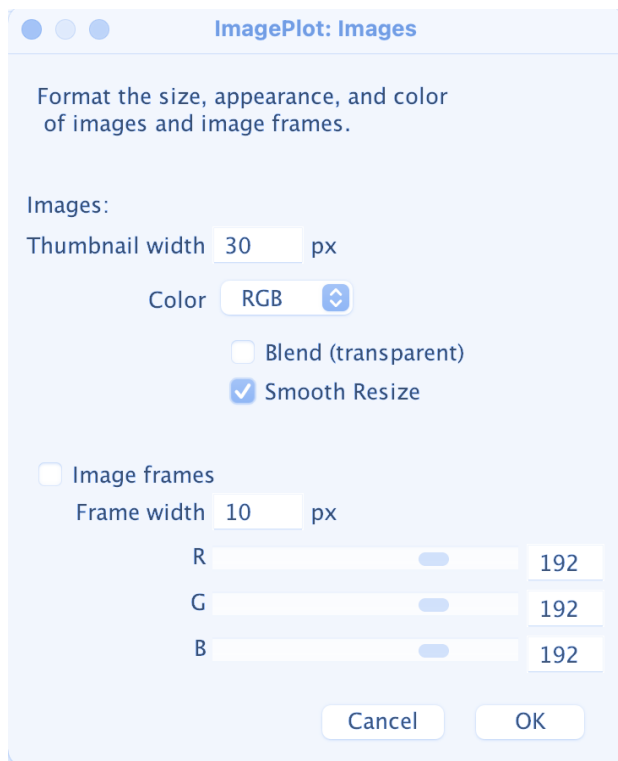
Visualizing image data as points using the same layout

1. Open ImageJ -> Plugins ->Macros ->Run

2. Select the folder ImagePlot Master -> ImagePlot.txt ->Open

3. Select Data and Options in the ImagePlot menu. Select "none" for images.

ImagePlot

Visualize collections of images.

Data   ../boredinthehouse_1641887673590 – time_likes_colors.tsv

Images   None

Display   during rendering

- ◯ Polar
- ◯ Save images for animation
- ◯ Save thumbnail images
- ◯ Save canvas when done

- ☑ Options

Cancel   OK
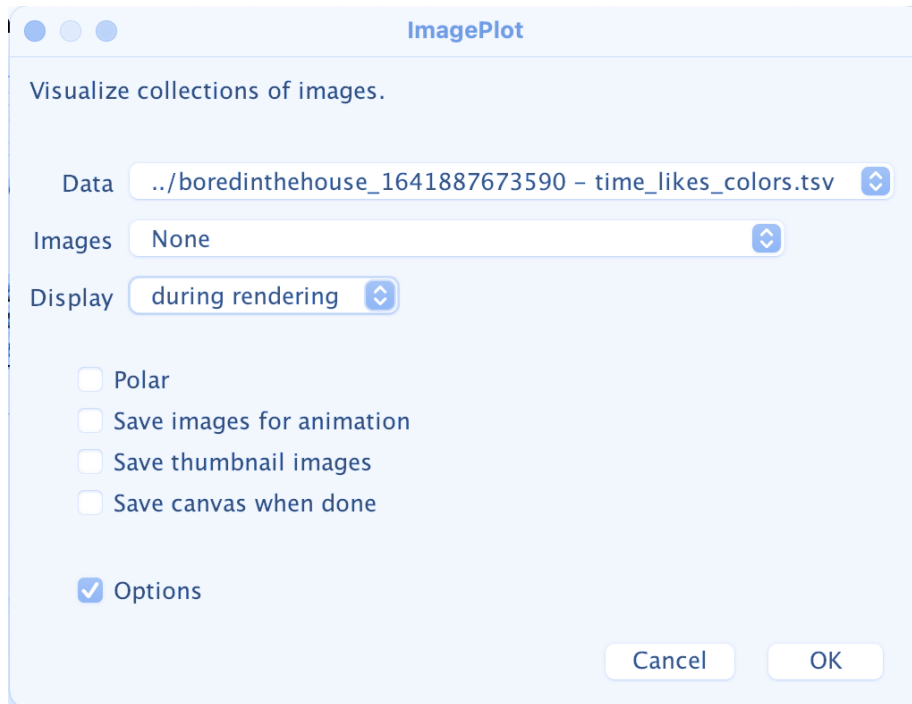
4. Choose data columns as follows*** OR opt for diggCount (like count) on the Y axis

ImagePlot: Data column mapping

Choose data columns to use for rendering visualization:

X axis   createTime (Column0)

Y axis   hue_median (Column8)

Cancel   OK
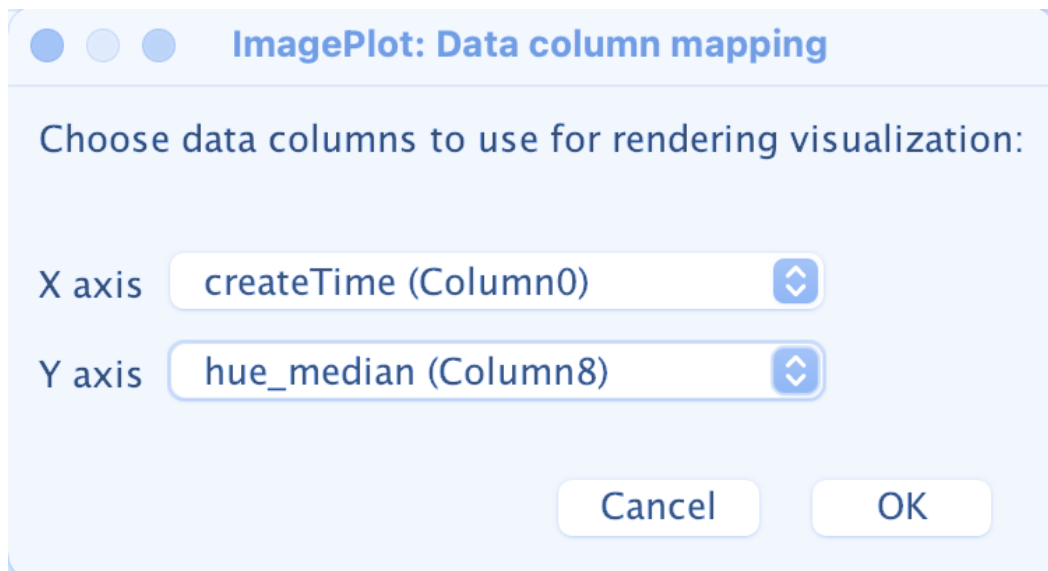
5. Select options as follows

Options

Select options to configure:

- ☑ Canvas
- ☑ Points
- ☐ Lines
- ☐ Labels
- ☐ Axis
- ☐ Range

[Cancel]   [OK]
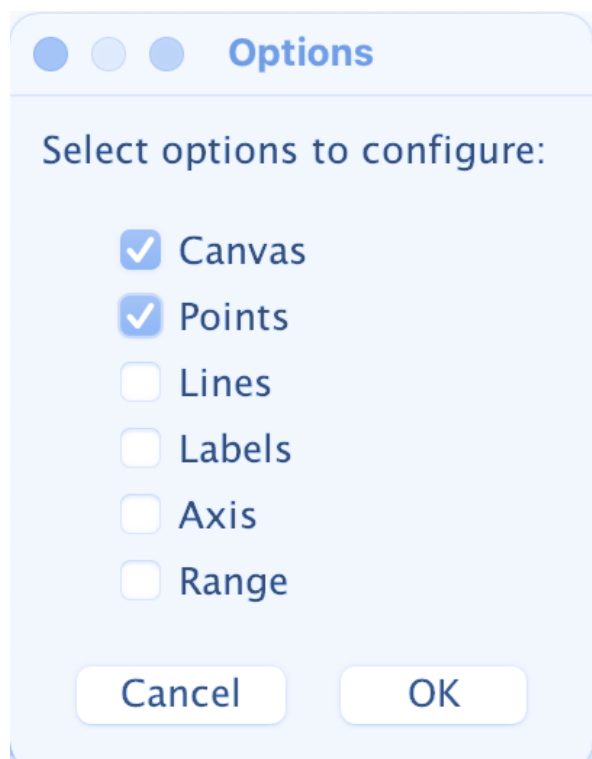
6. Set the canvas size and color as follows

ImagePlot: Canvas

Set the canvas size, border inset,
and background color.

Canvas width 1920 px
Canvas height 1080 px
Border size 80 px

Background R ⚬———————— 0
G ⚬———————— 0
B ⚬———————— 0

[Cancel]   [OK]
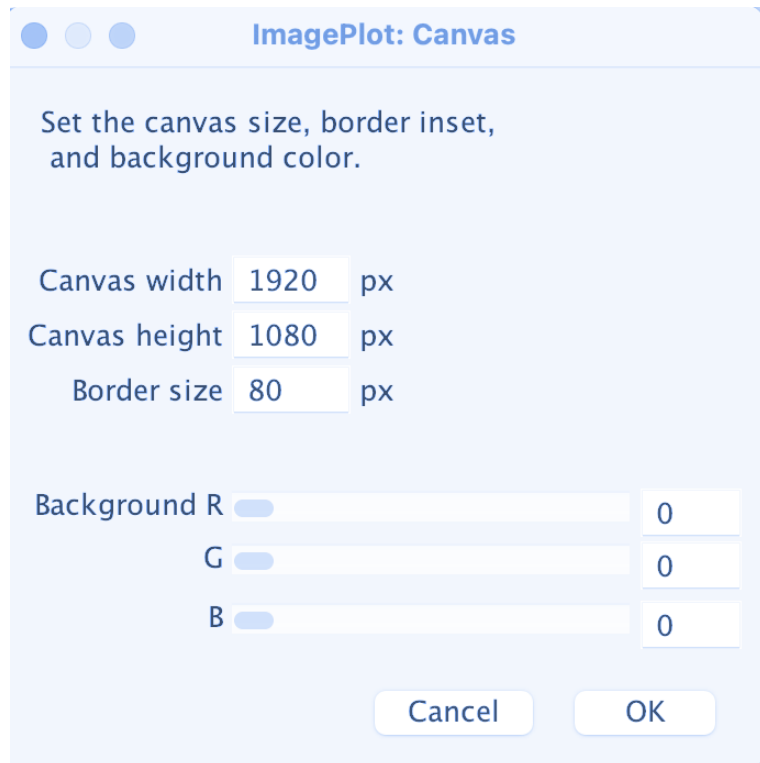
7. Select the size and color of data points as follows

ImagePlot: Elements

Adjust visual elements that appear with each data point or image.

☑ Points

Point style   Circle Filled   ⇕

Point size   30   px

R	●	255
G	●	255
B	●	255

Cancel   OK
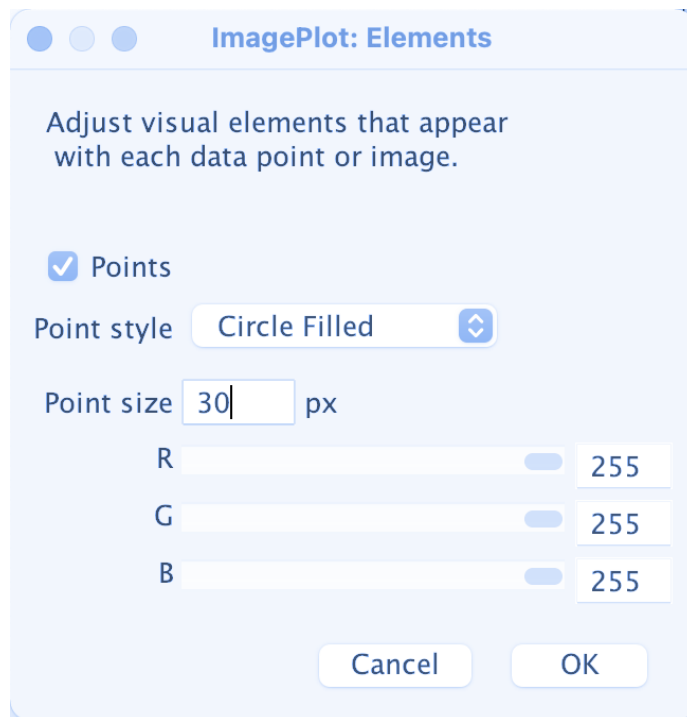
8. Select the image thumbnail width as follows

ImagePlot: Images

Format the size, appearance, and color of images and image frames.

Images:
Thumbnail width   30   px

Color   RGB   ⇕

☐ Blend (transparent)
☑ Smooth Resize

☐ Image frames
Frame width   10   px

R	●	192
G	●	192
B	●	192

Cancel   OK
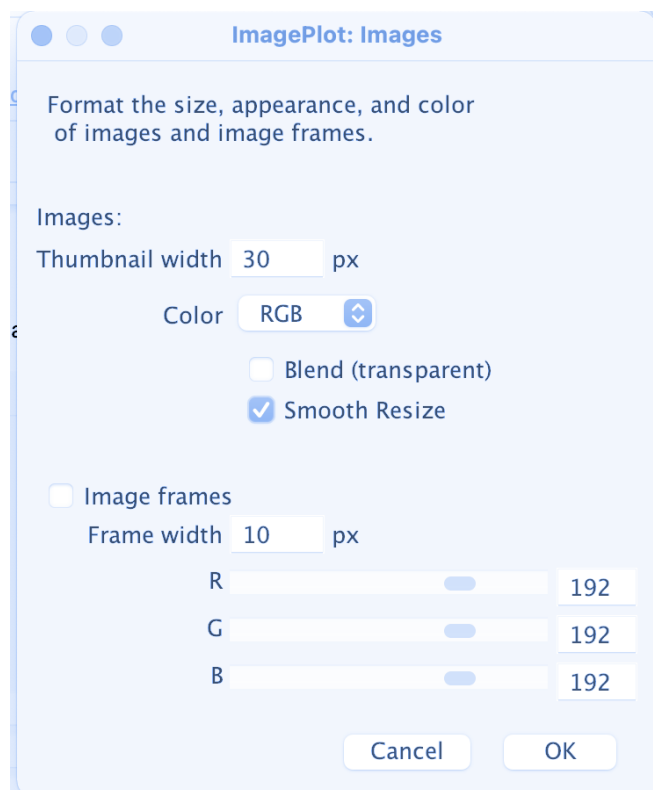
9. Visualize & Analyze (see the slides)!

time VS average hue

2_timestamp_hue_scatterplot_correct.png (50%)
1920x1080 pixels; RGB; 7.9MB
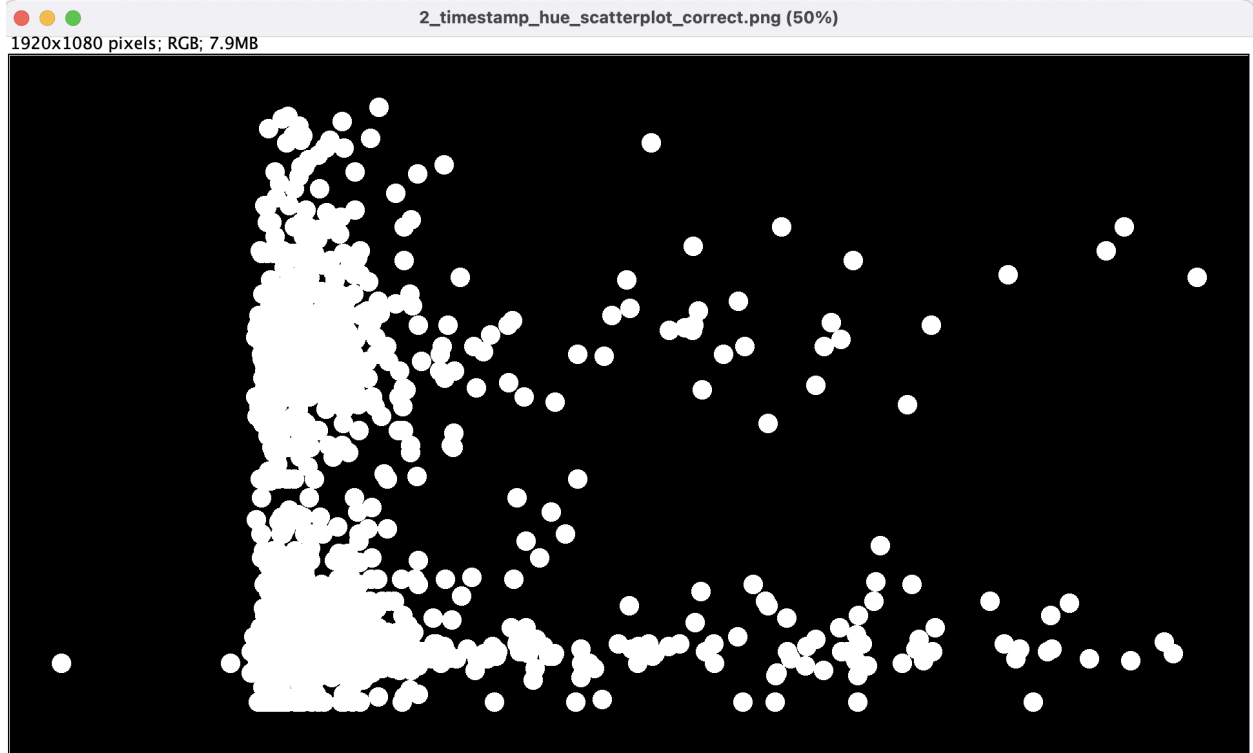
time VS digg count (likes count)

plot_time_likes_colors.tsv - createTime vs diggCount (50%)
1920x1080 pixels; RGB; 7.9MB
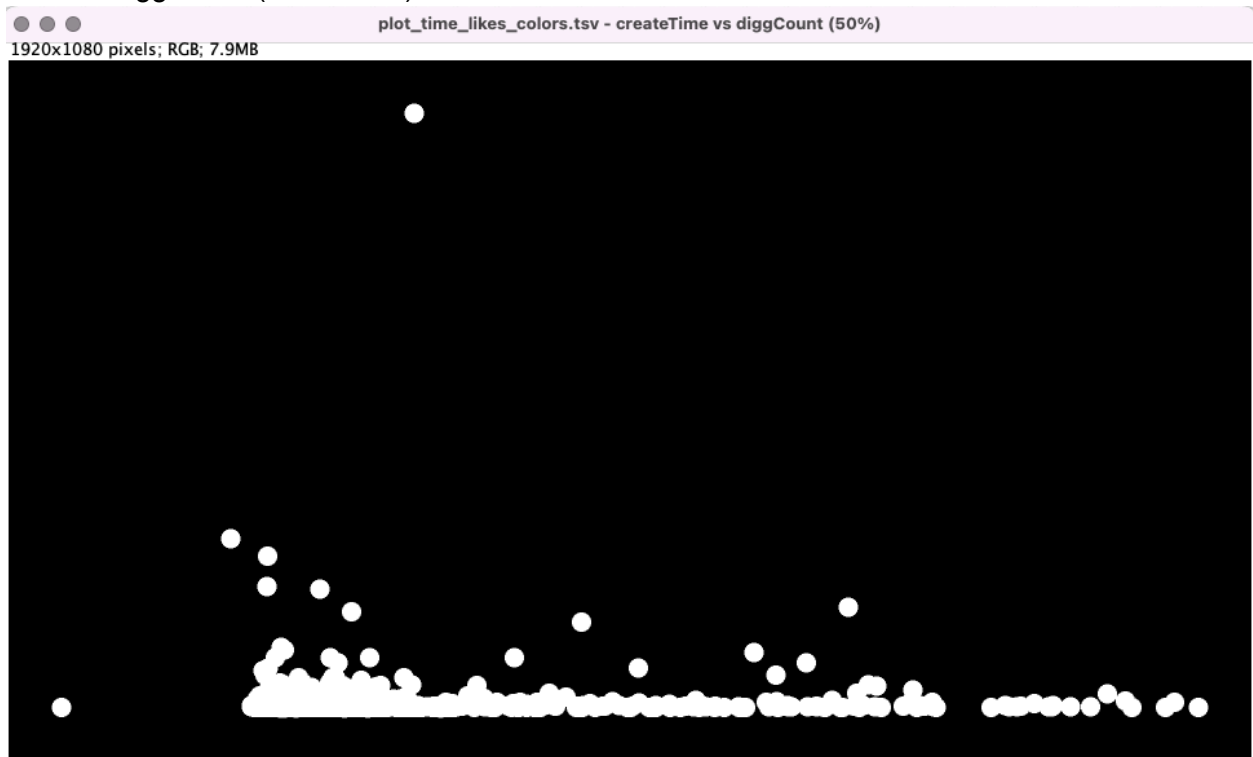
Plotting the images with ImageMontage.txt according to time frames/color similarity

1. Return to the .csv file containing image URLs + metadata in Google Spreadsheets

2. Next to the column "createtime" create a new column and call it e.g., "human time"

3. Copy your timestamp list from the column "createtime" in EpochConverter

4. Convert timestamps in human-readable dates and download as .csv file

5. Copy the resulting list of dates to the column "human time"

6. Create a new column, call it "Month" and specify the time frame (e.g., March, April, May)

E	F	G	H
createTim	humanTin	Year	Month
15735808	2019-11-12	2019	November
15833582	2020-03-04	2020	March
15845684	2020-03-18	2020	March

7. Create three separate new sheets for March, April, and May

8. Filter your data by month and copy it into separate sheets

9. Within each sheet, select the column hue_median and sort your data from A to Z

10. Create another sheet and merge the data (keep the same order)

11. Download the sheet as .tsv file and save the file in the image order

12. Open ImageJ -> Plugins -> Macros -> Run -> ImageJ -> Macros -> Image_Montage.txt

13. Image Source -> Data File

14. Select the options for a montage as follows

Image Montage

Create a montage of images.
Image sizes can vary.

Image Source   Data File

Canvas

Color Mode   RGB

Set Width   3840   px
Set Height   2160   px

Images

Row Height   80   px
X Spacing   0   px
Y Spacing   0   px

Number of Labels   2 Level

Labels

Set Text Size   70   pt

Text Color

R   110
G   110
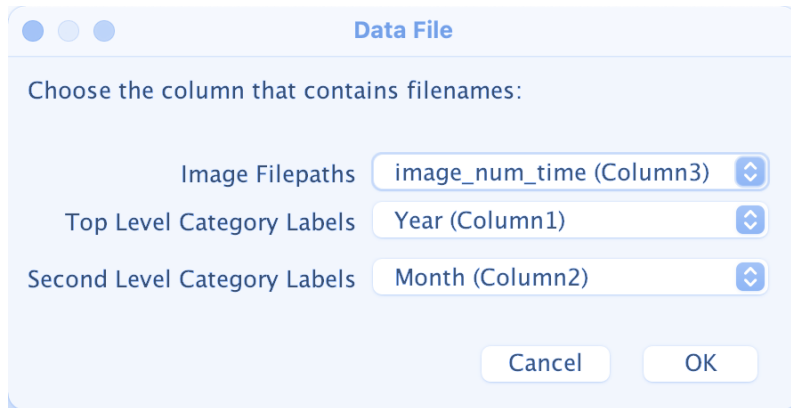B   110

Background Color

R   255
G   255
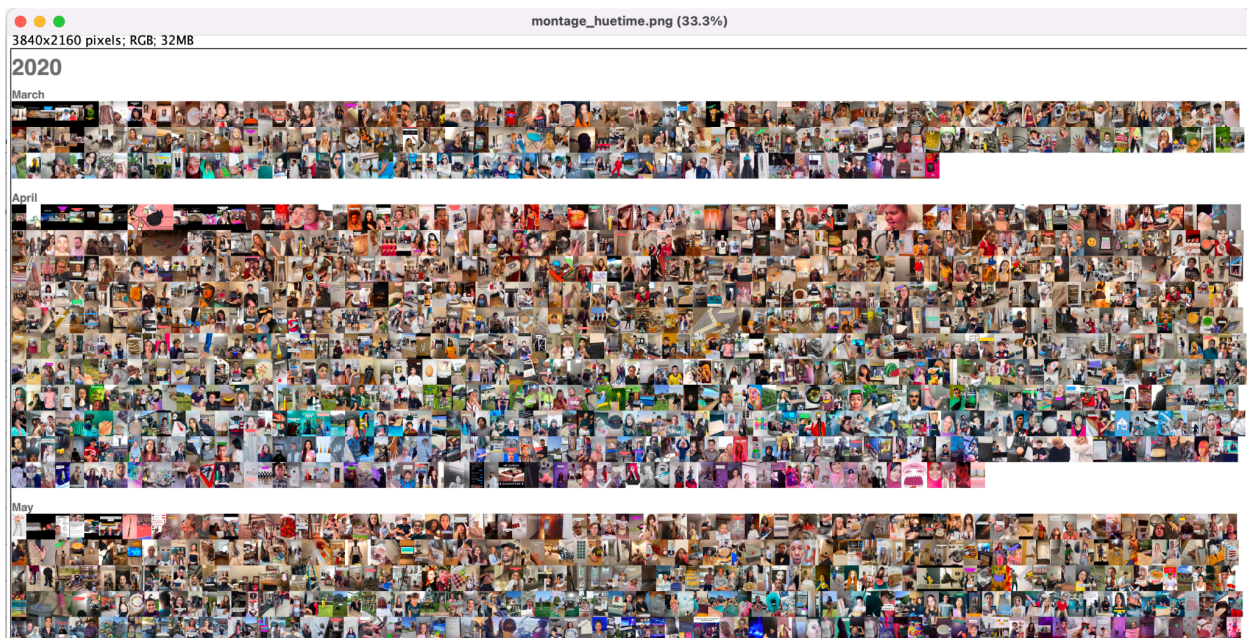B   255

Animation

☐ Save Images for Animation

Cancel   OK

15. Select the folder of images

16. Select the .tsv file you just created

17. Choose the column with the filenames

18. Visualize (the same technique can be used with AI-enriched data, e.g., Google Vision)

19. Run the images through Google Vision API using MemeSpector GUI (Chao, 2021)

20. Copy the column "label description" in your TikTok data spreadsheet

21. Make sure that the order of images is correct and that the labels correspond

22. To create a montage, repeat the steps 7-15, but use the column "label description"

2020

March

April
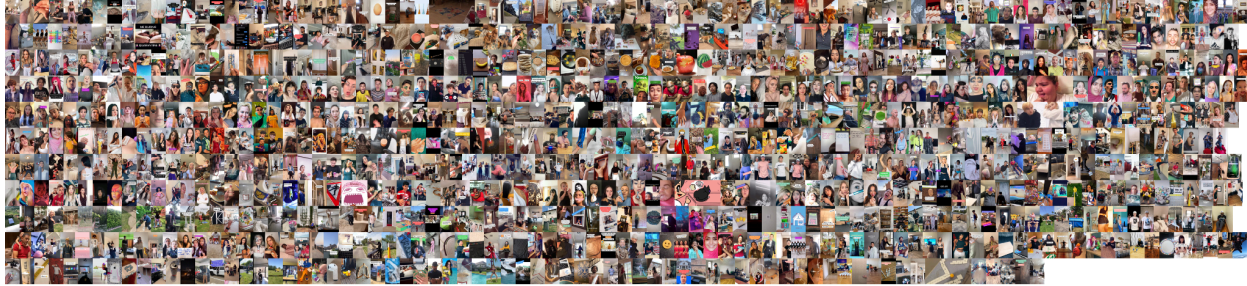
May

2020

March

April

May

⊙ Faces, Bodies, Gestures   ⊙ Cats of TikTok   ⊙ Food   ⊙ Wood   ⊙ Outside

BONUS1: Extract video frames from a list of videos and visualize them sequentially

1. Install [ffmpeg](#) by following the updated guides on YouTube

   1.1 Video Guide for [Mac](#) (RickMakes 2020; works for both Catalina and Monterey)
   1.2 Video Guide for [Windows](#) (TroubleChute 2020)

2. Structure TikTok metadata by the count of likes (digg_count)

3. Filter top 10 videos sharing a sound

4. Download TikTok videos e.g.., using [TikPac Downloader Extention for Chrome](#)

5. Merge videos in Clideo: https://clideo.com/merge-video

6. Save the video file in a folder, rename the file in video.mp4

7. Use ffmpeg python script to 'deconstruct' the video in a series of frames

8. Open terminal

9. Change directory to the folder containing the video file you just saved ->

10. Type cd, drag&drop the folder in terminal, hit enter

11. Type `ffmpeg -i video.mp4 thumb%04d.jpg -hide_banner` and hit enter to get every frame

12. OR type `ffmpeg -i video.mp4 -r 1 thumb%04d.jpg -hide_banner` to get every 25th frame

13. For multiple files in a folder use
    `for f in *.mp4; do ffmpeg -i "$f" -r 1 "${f%mp4}thumb%04d.jpg";done`

14. All individual frames will be saved in the same folder as the original video file

15. Select all images from the folder, copy the file names and paste in the spreadsheet

16. Watch this [YouTube tutorial](#) if you use Windows (on Mac, just copy & paste)

17. The result is a column with the image filenames

18. (Optional) To select, e.g., every 10th image frame, use this formula in Google sheets

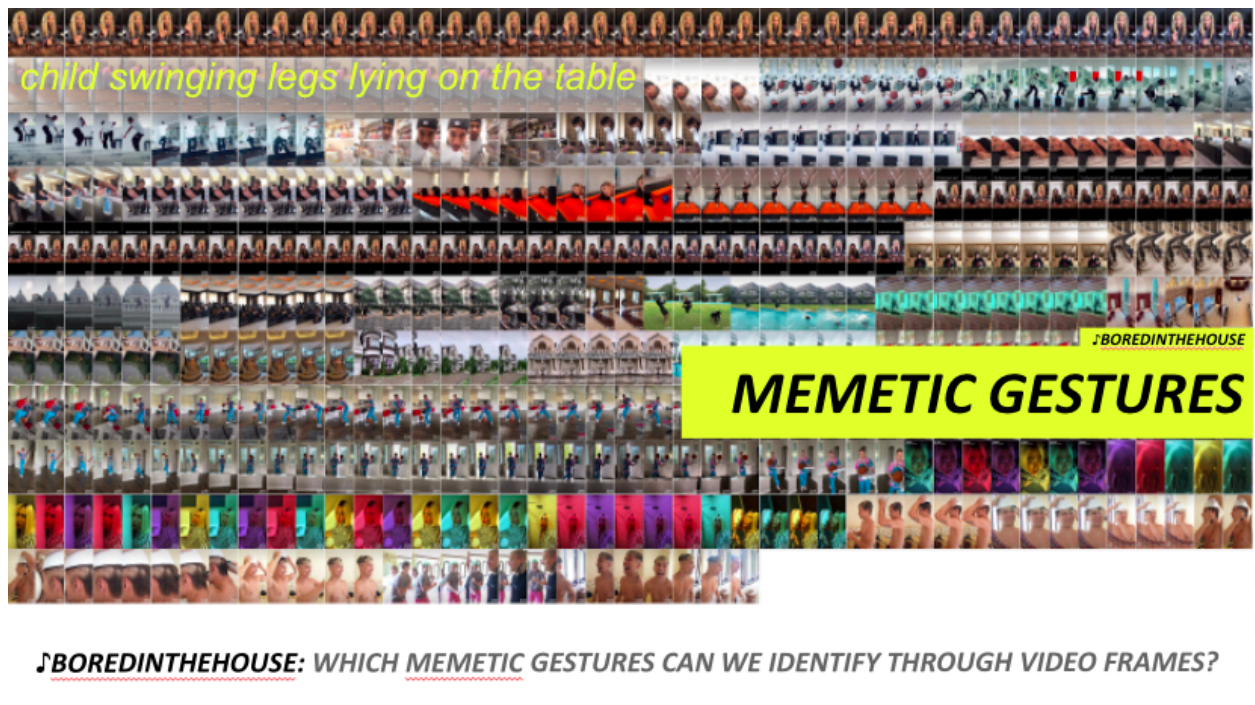19. Filter by condition -> custom formula is =mod(row(A1),10)=0
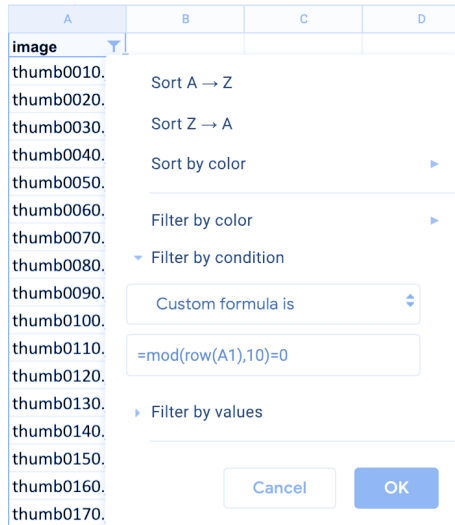
20. Copy & paste the result in a new sheet

21. Download the sheet as .tsv file and save the file in the image order

22. Open ImageJ -> Plugins -> Macros -> Run -> ImageJ -> Macros -> Image_Montage.txt

23. Explore the results -> rethink the vis in terms of ethical fabrication ([Markham 2012](#))

BONUS2: Visualise relations of ♪BOREDINTHEHOUSE co-hashtags and image content using GV API labels and RAWGRAPHS

1. Open a spreadsheet containing TikTok #boredinthehouse data

2. Download TikTok video thumbnails to a local folder (see how-to here)

3. Copy and paste the filenames to a new column (see how-to here)

4. Run the images through Google Vision API using MemeSpector GUI (Chao, 2021)

5. More on Memespector GUI: Enriching Image Data with AI here (Chao & Omena, 2021)

6. Copy the column "label description" in your TikTok data spreadsheet

7. Make sure that the order of images is correct and that the labels correspond

8. Filter the sheet by "boredinthehouse" sound-meme using the column "music meta"

9. Copy data in a separate sheet

10. Extract hashtags from the column "text" ->

11. Use the formula =trim(regexreplace(A2, "(^|\s)[^#]\S*", ""))

12. Copy hashtags and "paste special" to a new column by using "values only"

13. Copy the hashtag column to TagCrowd

14. Select three #boredinthehouse co-hashtags (e.g., quarantine, comedy, dance)

15. Filter the sheet using the first hashtag #quarantine

16. Copy & paste the filtered hashtag column to TagCrowd & calculate the frequencies

17. Make sure to use quarantine, comedy, dance, boredinthehouse as stopwords

18. Copy & paste the frequencies to a new sheet

19. Use Data -> Split text to columns -> custom. Type ") "

20. Paste transposed

21. Use Data -> Split text to columns -> custom. Type " ("

22. This should result in this type of hierarchy (top 10 #quarantine co-hashtags + count)

A	B	C
hashtag	co-hashtag	count
quarantine	fyp	31
quarantine	foryoupage	16
quarantine	foryou	14
quarantine	quarantinelife	14
quarantine	bored	11
quarantine	boredathome	6
quarantine	covid	6
quarantine	coronavirus	5
quarantine	viral	5
quarantine	boredinthehouse	4

23. Repeat the steps 14-21 using the column "label description"

24. This should result in this type of hierarchy (top 10 labels related to #quarantine)

A	B	C
hashtag	label	count label
quarantine	flooring	35
quarantine	wood	22
quarantine	comfort	15
quarantine	thigh	15
quarantine	dog	13
quarantine	font	10
quarantine	hardwood	10
quarantine	art	9
quarantine	design	9
quarantine	knee	9

25. Merge all columns in the same sheet

A	B	C	D	E
hashtag	co-hashtag	count co-hasht	label	count label
quarantine	fyp	31	flooring	35
quarantine	foryoupage	16	wood	22
quarantine	foryou	14	comfort	15
quarantine	quarantinelife	14	thigh	15
quarantine	bored	11	dog	13
quarantine	boredathome	6	font	10
quarantine	covid	6	hardwood	10
quarantine	coronavirus	5	art	9
quarantine	viral	5	design	9
quarantine	boredinthehouse	4	knee	9

26. Repeat the same procedure for #comedy and #dance OR (if familiar with Gephi, build a bi-partite hashtag-image label network and export ego-networks for each hashtag as a spreadsheet).

27. Merge everything in one sheet and copy to RawGraphs

28. Select "Alluvial Diagram"

29. Map the chart variables as follows

3. Mapping

DIMENSIONS

Aa hashtag

Aa co-hashtag

\# count co-hashtag

Aa label
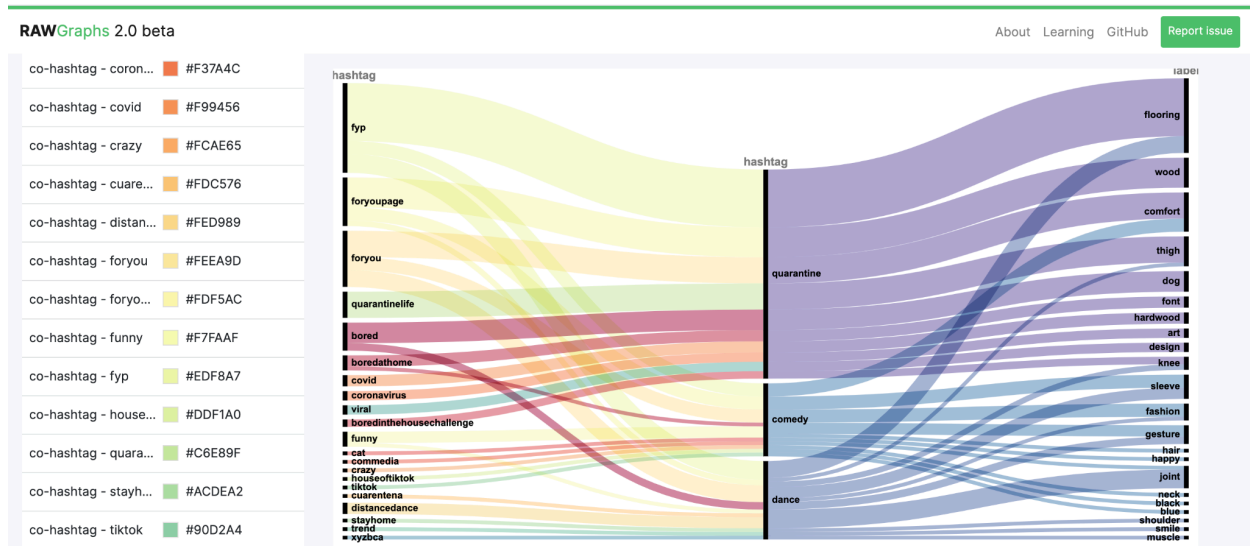
\# count label

CHART VARIABLES

\# 🕐 Aa Steps ✳

Aa co-hashtag ✕

Aa hashtag ✕

Aa label ✕

Drop another dimension here

\# Size

\# count co-has... Sum ▾ ✕

30. Customize the artboard

31. Define the color scheme -> spectral discrete

32. Sort nodes by -> minimize overlaps

33. Flows alignment -> bottom

34. Adjust link opacity

35. This should result in a visualization like this

36. Export or make a screenshot