Artificial Intelligence for Fashion – Final project

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Project idea

- The consumer-to-shop task, is known and hard-to-solve problem in the context of Artificial Intelligence for fashion [1,2];

- It consist in recognizing the exact fashion item wear by a person in an everyday situation, retrieving pictures of people wearing it in a professional setting (models for e-commerce site, fashion shows...)

ASOS Style Match

- This task was also faced by ASOS that deployed on its e-commerce platforms, the so called Style Match: «Upload a photo from your gallery or take a photo directly from the App and we'll take care of the rest. We will help you find the item in the photo or suggest something similar. To use Style Match, click on the camera icon in the search bar and then proceed to take a photo or upload one from your gallery.»

- I have tried with some of my pictures in different positions:

- Despite the growing interest on this topic [3,4,5], there is a lot of work to do to achieve high performances;
- We are not here to solve one of the most difficult problems in Computer Vision in the field of fashion, but we can give a little contribution analyzing how well-known deep learning model, available on Orange, are good to catch visual similarities in such a context;
- We can create a small consumer-to-shop dataset, considering pictures depicting you wearing some cloth items and searching for professional images that depict them!

Data collection pseudo-algorithm

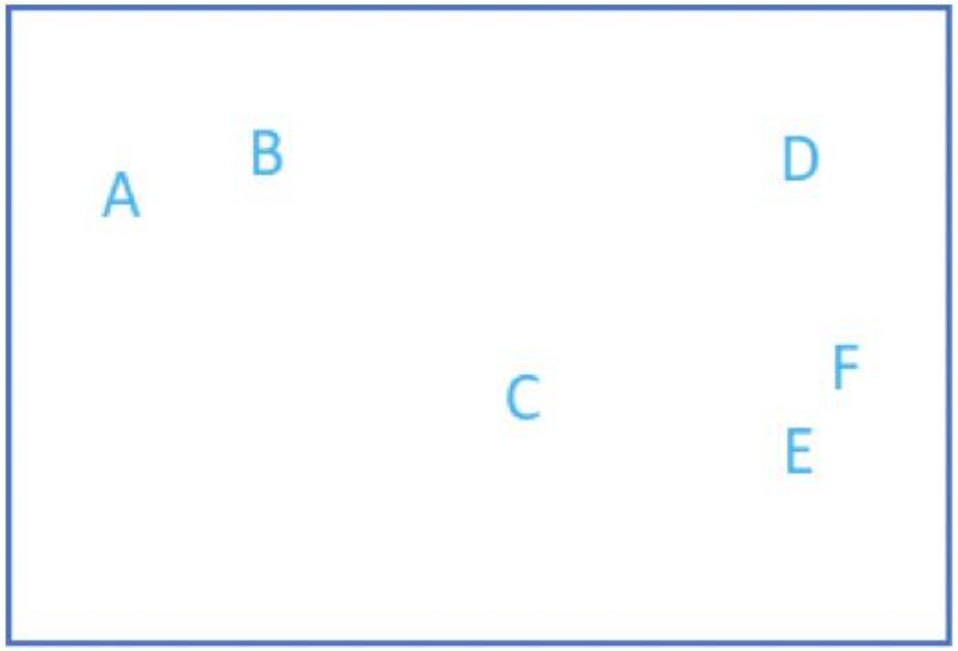
1. Create a folder called "{name}_{surname}_AIFF_2022"
2. Open the folder and repeat the following steps for at least 3 different fashion items:
    a) Take a picture of yourself in different context wearing the same cloth item;
    b) Find at least 5 different images of the same (or practical equal) cloth item in a professional setting;
    c) Put your custom and professional images in a sub-folder called "dress_{id}";

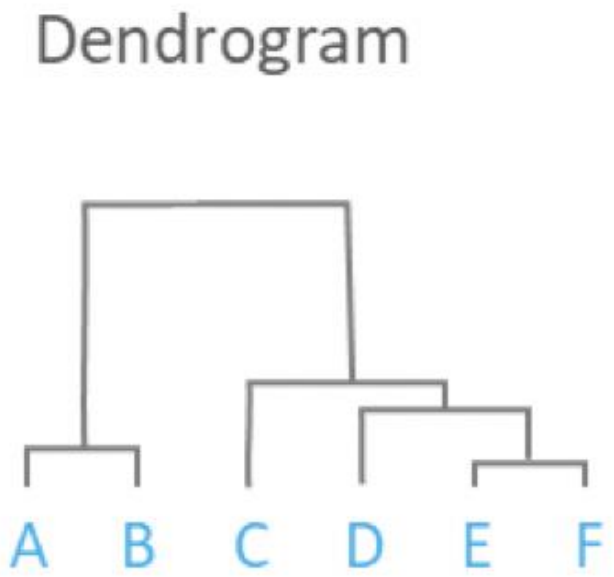
Example directory

https://drive.google.com/drive/folders/1LoOmFDffBK0k_yybU_GhYN90pS4Yuung?usp=sharing

How to use these collected images?

Surprise: Unsupervised Machine learning and Hierarchical clustering





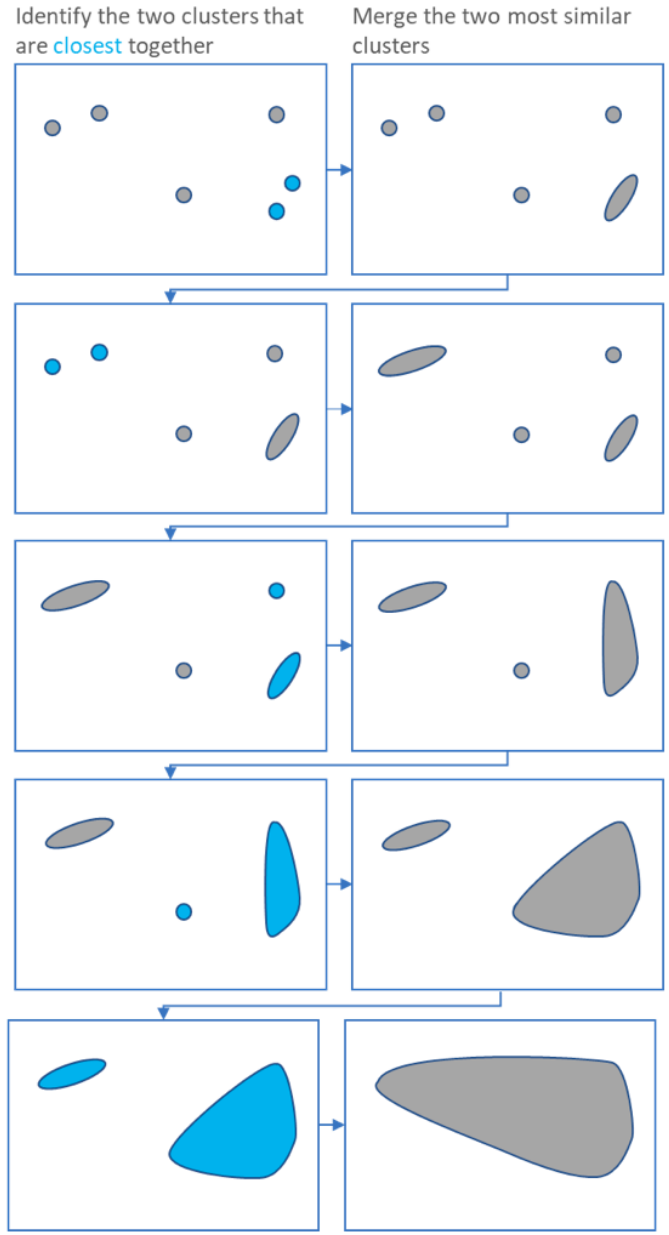
- ***Hierarchical clustering*** is a machine-learning-based algorithm that groups similar objects into groups called *clusters*.

- The endpoint is a set of clusters, where each cluster is distinct from each other cluster, and the objects within each cluster are broadly similar to each other.

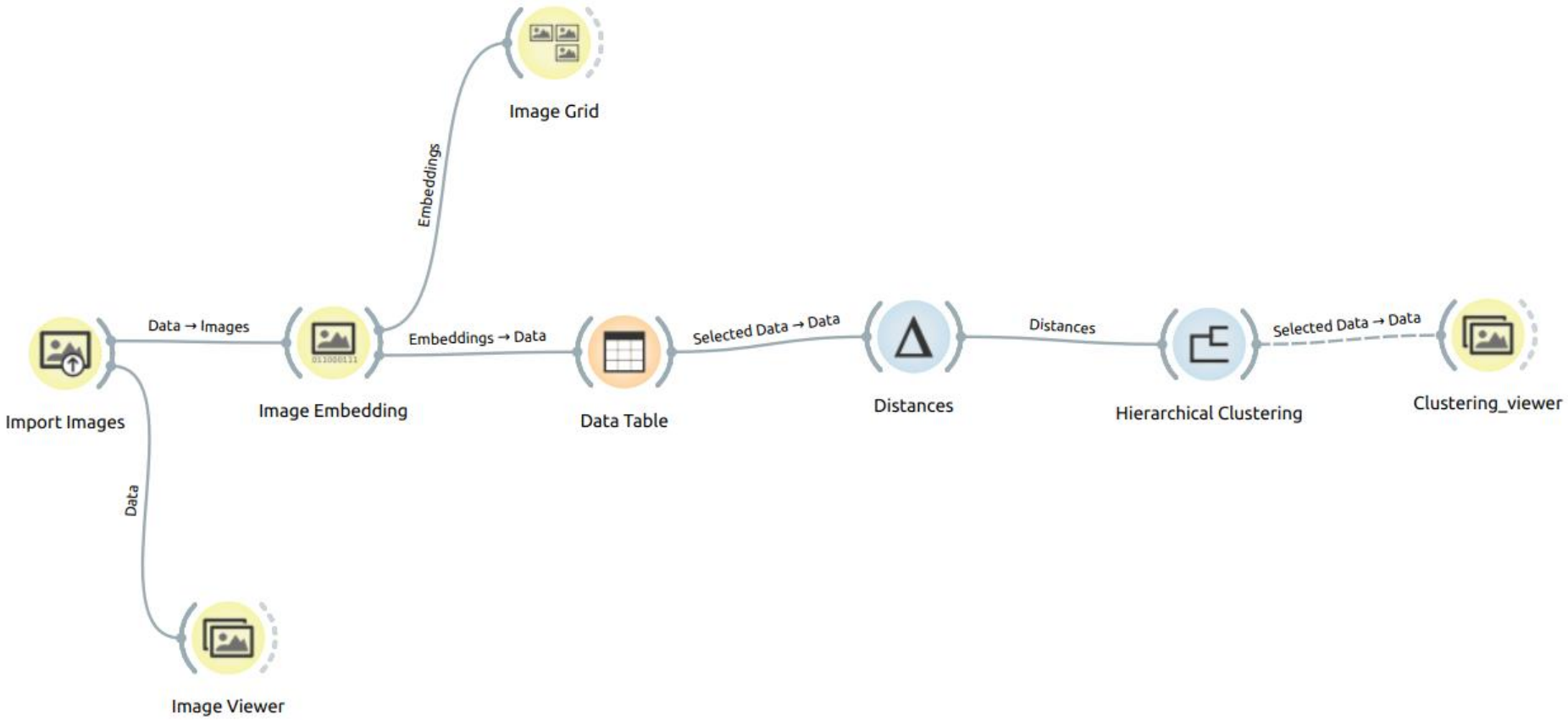
- How similar objects are, can be decided with image features coming from Deep Learning models in Orange and a distance metric!

How Hierarchical clustering works

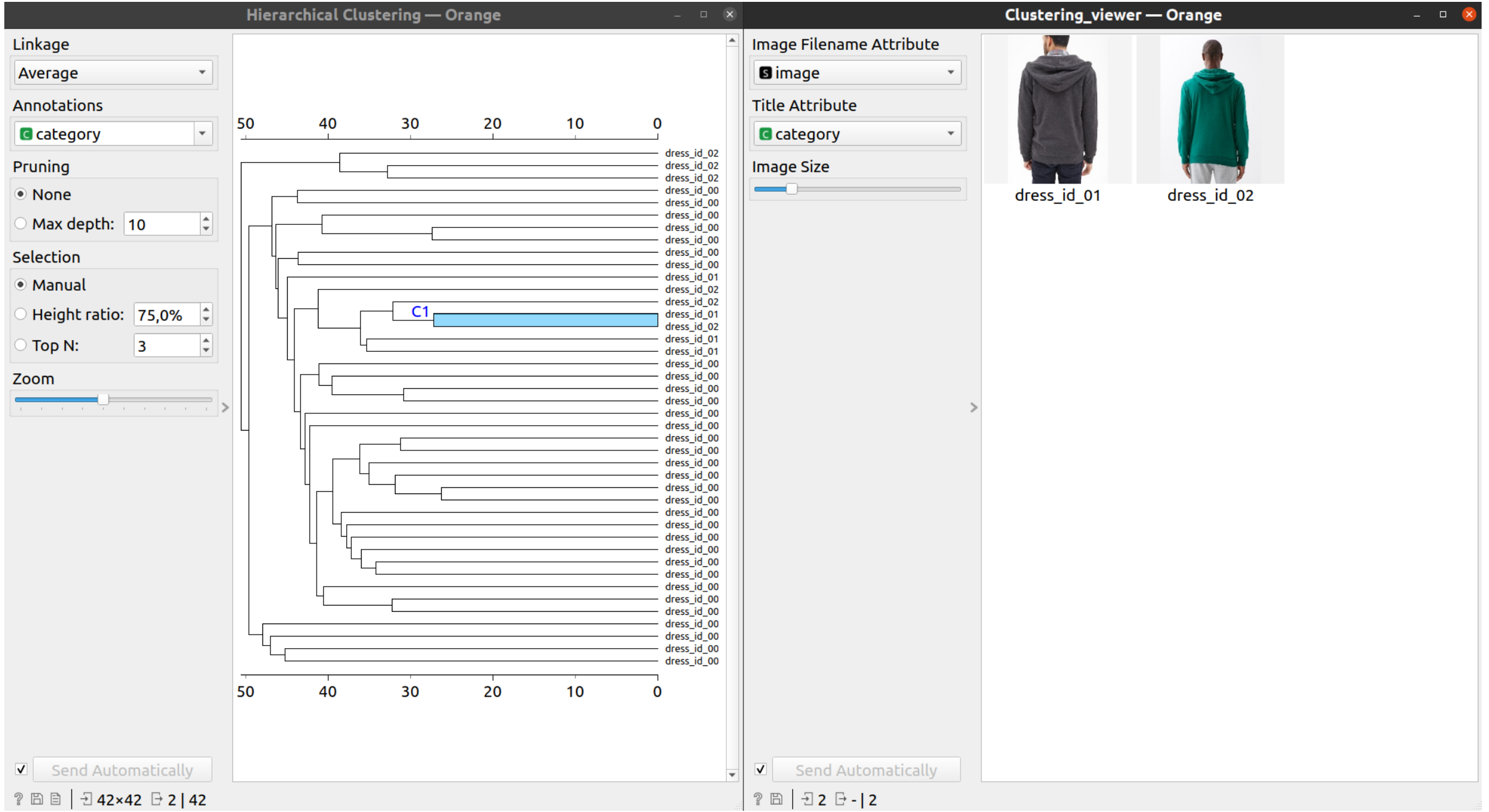
- Hierarchical clustering starts by treating each observation as a separate cluster.
- Then, it repeatedly executes the following two steps: (1) identify the two clusters that are closest together, and (2) merge the two most similar clusters.
- This iterative process continues until all the clusters are merged together;



Free Sample with Orange and FashionMNIST



Find the most interesting clusters and report them into the presentation!


Hierarchical Clustering — Orange
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Hierarchical Clustering — Orange

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Annotations
category

Pruning
None
Max depth: 10

Selection
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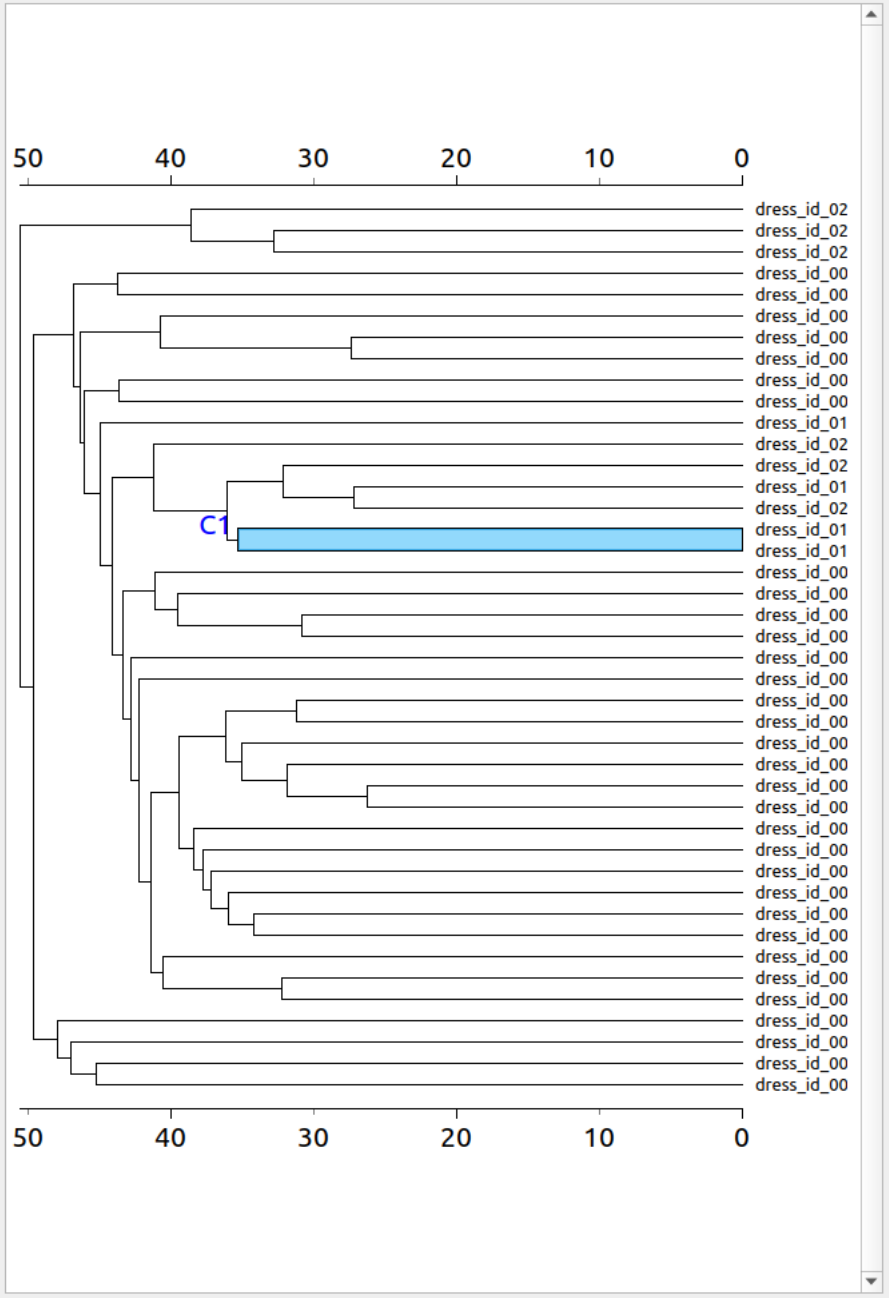
Height ratio: 75,0%
Top N: 3

Zoom



Send Automatically

42×42 2 | 42

Clustering_viewer — Orange

Image Filename Attribute
image

Title Attribute
category

Image Size


dress_id_01


dress_id_01

Send Automatically

2 - | 2

Hierarchical Clustering — Orange

Linkage
Average

Annotations
category

Pruning
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Max depth: 10

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Height ratio: 75,0%
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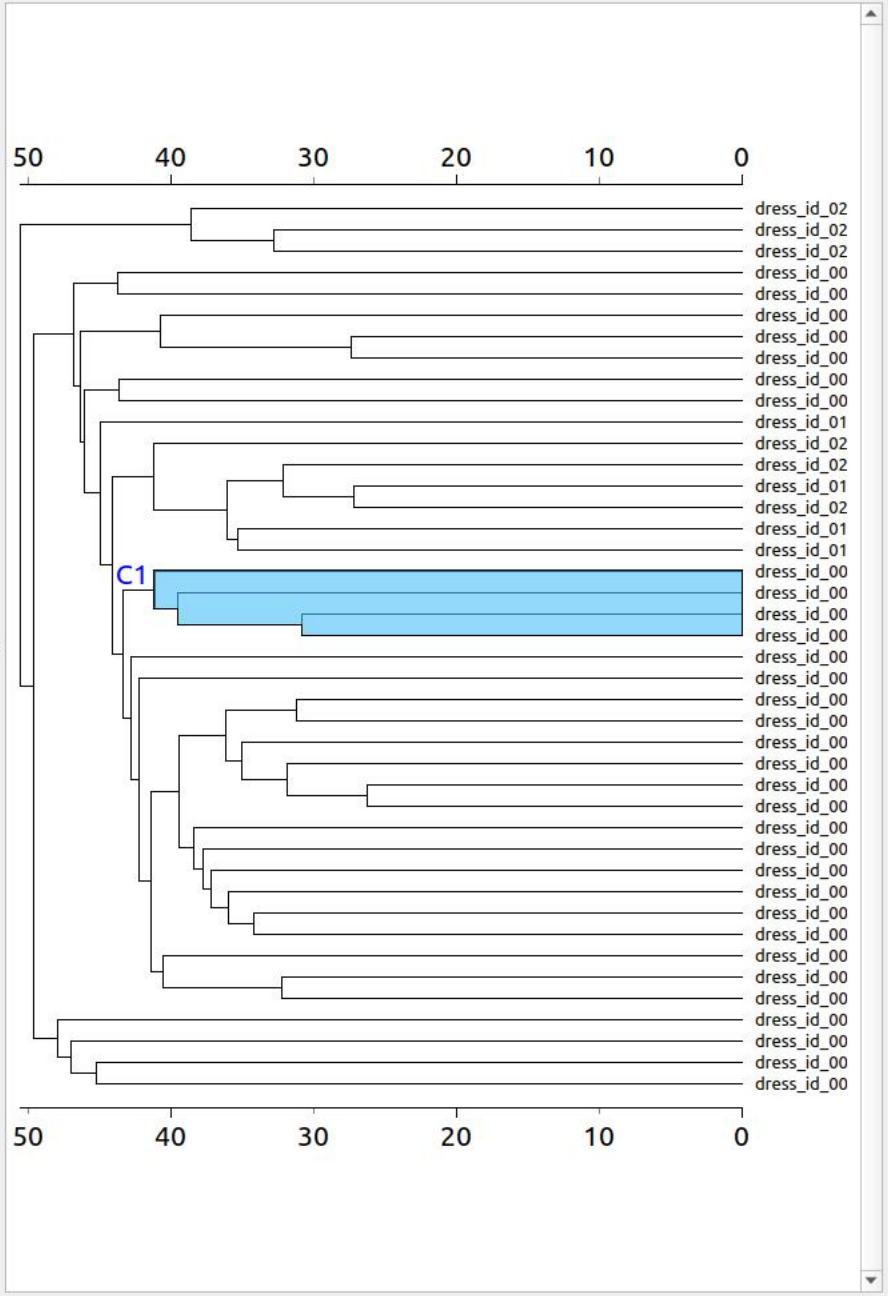
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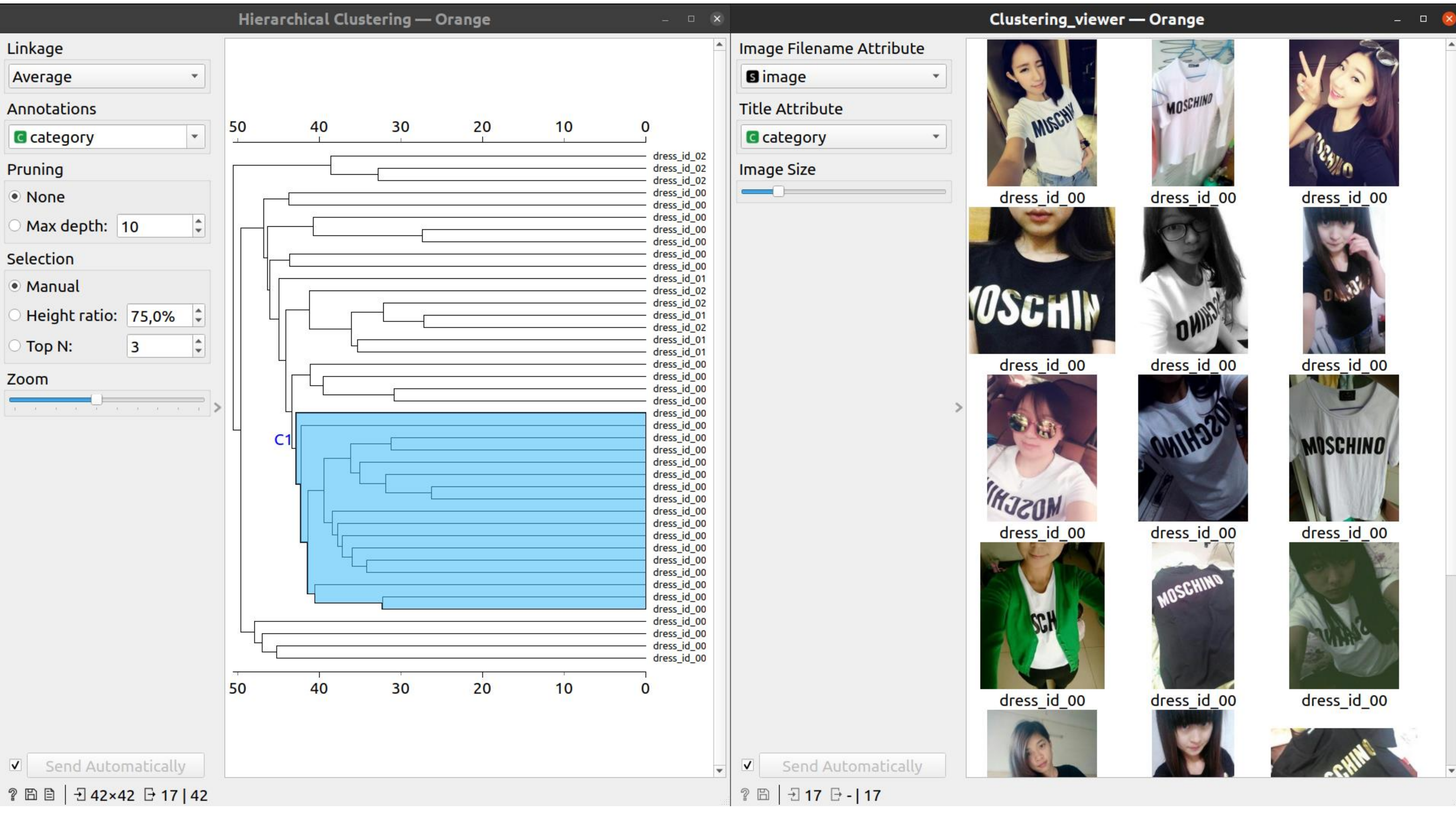
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Clustering_viewer — Orange
Image Filename Attribute
image
Title Attribute
category
Image Size
Send Automatically
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dress_id_00

All the presentations will be available on GitHub!

1. This is motivated by the fact that I want you to get some public merit for your work :)

2. It would be perfect if you would be able to use a little bit of Git and Github to let your name appear in the Github repository;

3. In any case, I will cite you in the project folder, linking optional personal web pages or curriculum :)

Sources

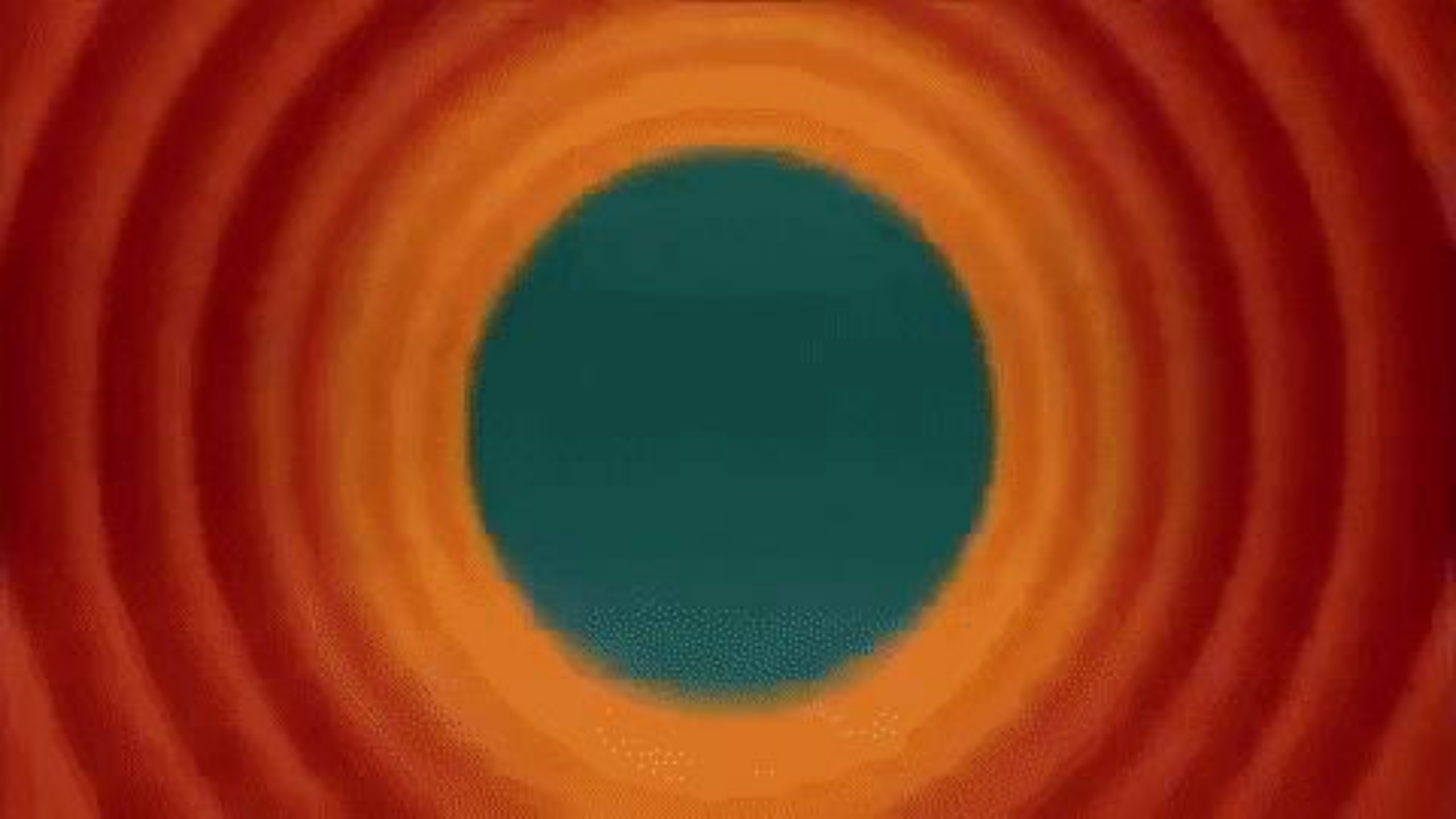
- [1] Liu, Z., Luo, P., Qiu, S., Wang, X., & Tang, X. (2016). Deepfashion: Powering robust clothes recognition and retrieval with rich annotations. In *Proceedings of the IEEE conference on computer vision and pattern recognition* (pp. 1096-1104).

- [2] Hadi Kiapour, M., Han, X., Lazebnik, S., Berg, A. C., & Berg, T. L. (2015). Where to buy it: Matching street clothing photos in online shops. In *Proceedings of the IEEE international conference on computer vision* (pp. 3343-3351).

- [3] Ji, X., Wang, W., Zhang, M., & Yang, Y. (2017, October). Cross-domain image retrieval with attention modeling. In *Proceedings of the 25th ACM international conference on Multimedia* (pp. 1654-1662).

- [4] Gajic, B., & Baldrich, R. (2018). Cross-domain fashion image retrieval. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops* (pp. 1869-1871).

- [5] Chopra, A., Sinha, A., Gupta, H., Sarkar, M., Ayush, K., & Krishnamurthy, B. (2019). Powering robust fashion retrieval with information rich feature embeddings. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops* (pp. 0-0).



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