



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Artificial Intelligence for Fashion – Final project

Lorenzo Stacchio

PhD student in Computer Science

Dipartimento di Scienze per la Qualità della Vita

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

Nome ↑



lorenzo_stacchio_AIFF_2022

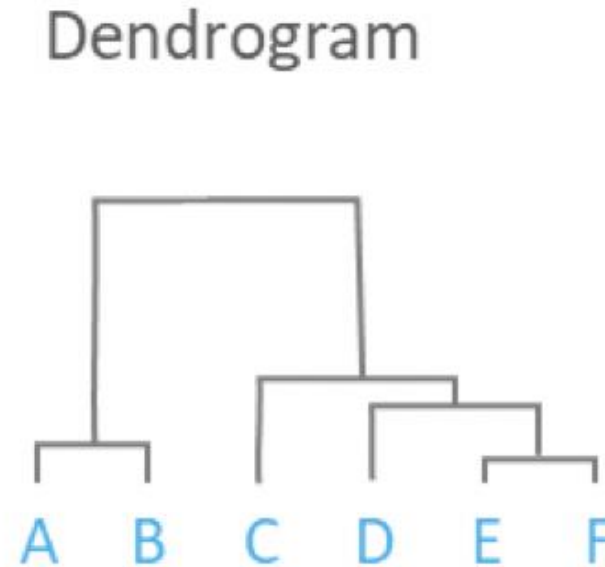
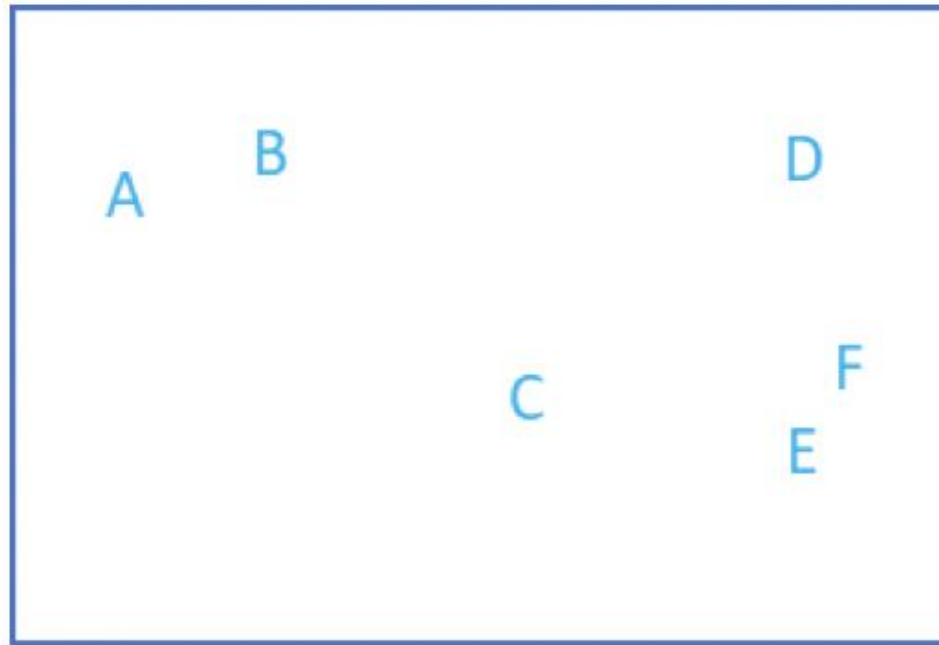
https://drive.google.com/drive/folders/1LoOmFDffBK0k_yybU_GhYN90pS4Yuung?usp=sharing



How to use these collected images?



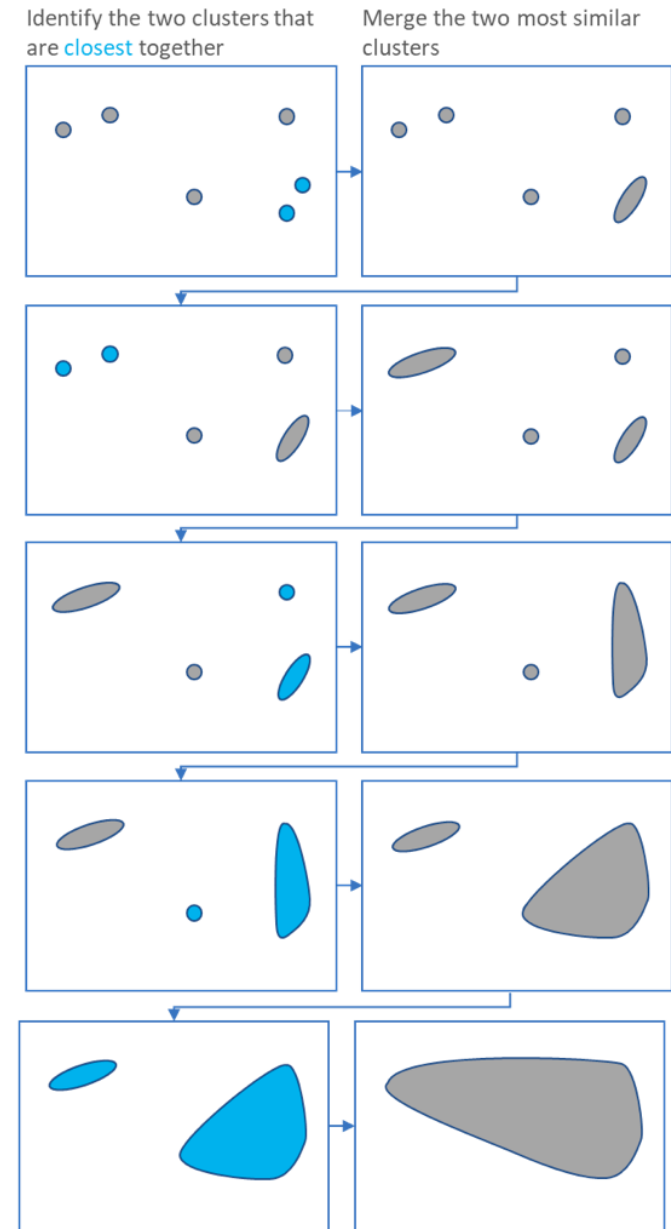
Surprise: Unsupervised Machine learning and Hierarchical clustering



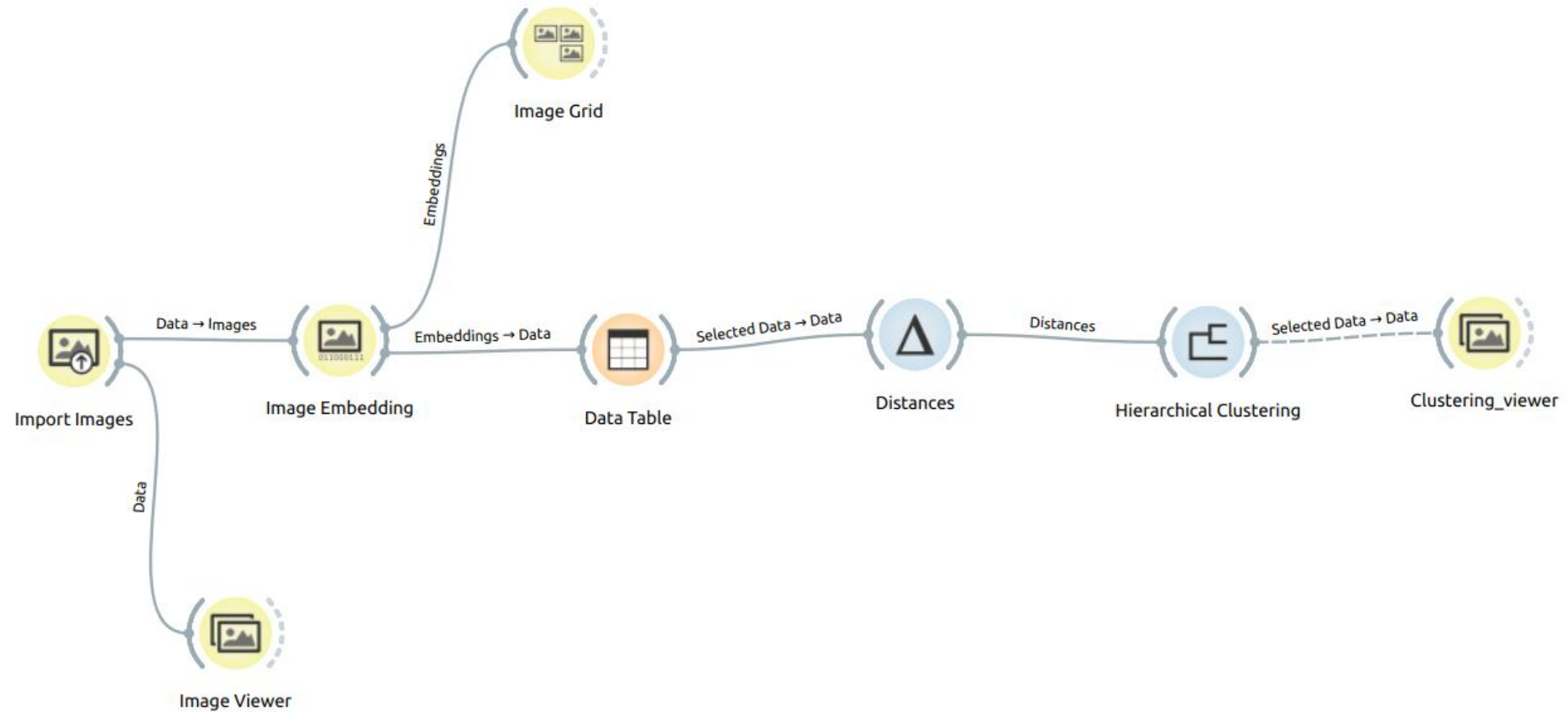
- **Hierarchical clustering** is a machine-learning-based algorithm that groups similar objects into groups called *clusters*.
- The endpoint is a set of clusters, where each cluster is distinct from each other cluster, and the objects within each cluster are broadly similar to each other.
- How similar 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;



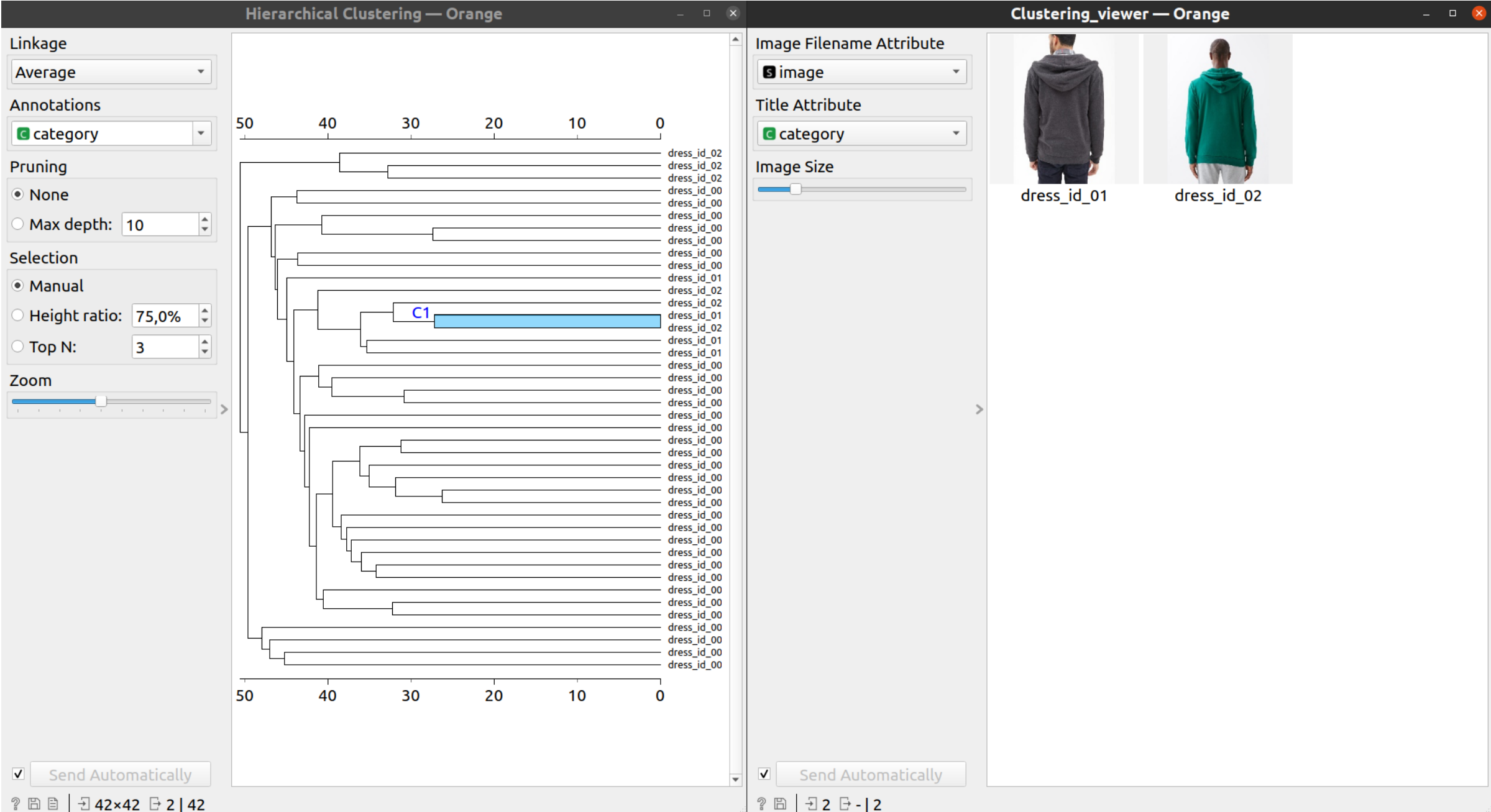
Free Sample with Orange and IMAGO



<https://drive.google.com/drive/folders/1R8sN1pLdnSHgW5AWBeaX4ltoq-oOQ6gJ?usp=sharing>



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



Average

category

☒ None

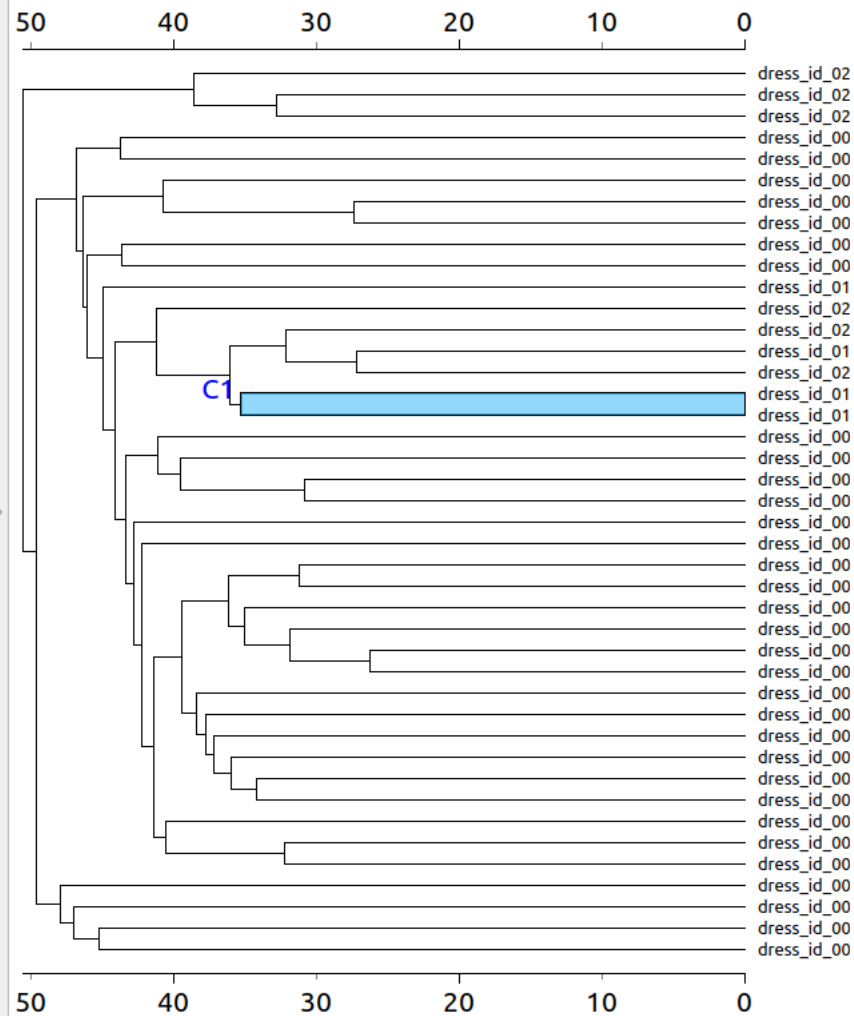
☐ Max depth:

☒ Manual

☐ Height ratio:

☐ Top N:

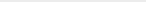
A horizontal slider control. It consists of a blue bar on the left and a white knob with a grey shadow. The knob is positioned at the midpoint of the bar. The bar has tick marks along its length.

☒ Send Automatically

42x42 2 | 42

s image

category



dress_id_01



dress_id_01

☒ Send Automatically

2

Clustering_viewer — Orange

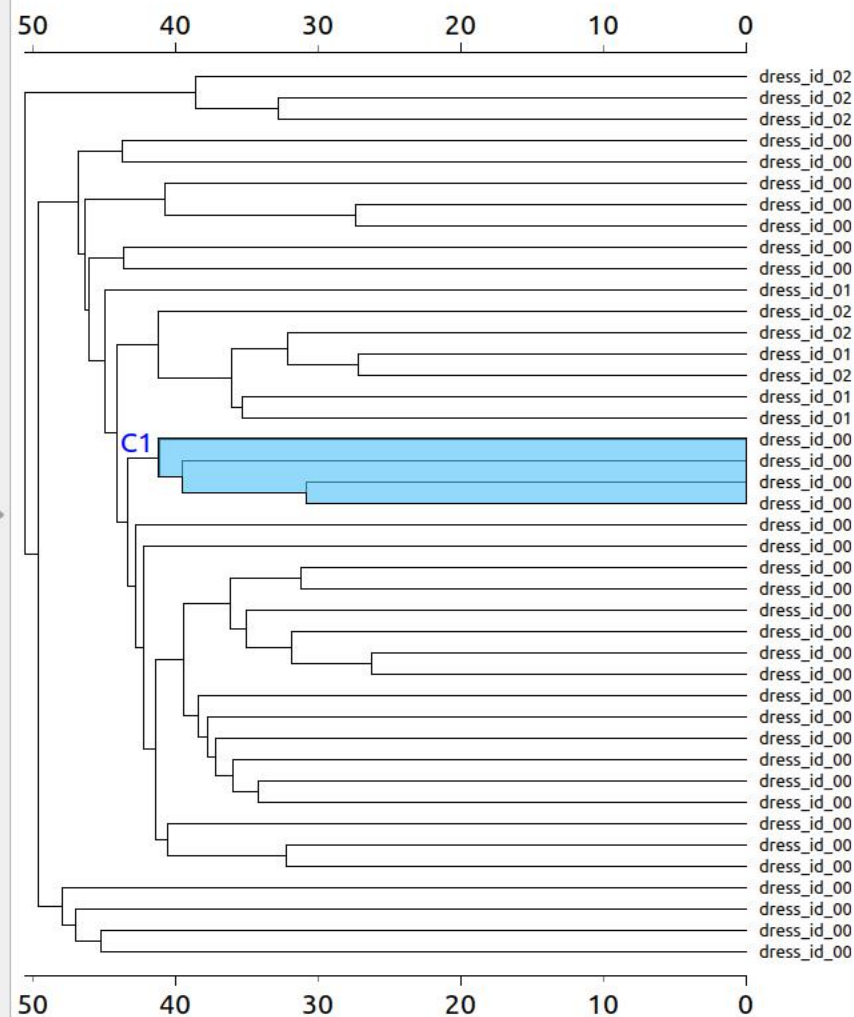
Average

category

☒ None

☐ Max depth: 10

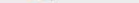
☒ Manual
☐ Height ratio: 75,0%
☐ Top N: 3

☒ Send Automatically

?   |  42x42  4 | 42

 image

c category



dress_id_00



dress_id_00



dress_id_00



dress_id_00

☒ Send Automatically

? | 4 | 4

Linkage

Average

Annotations

category

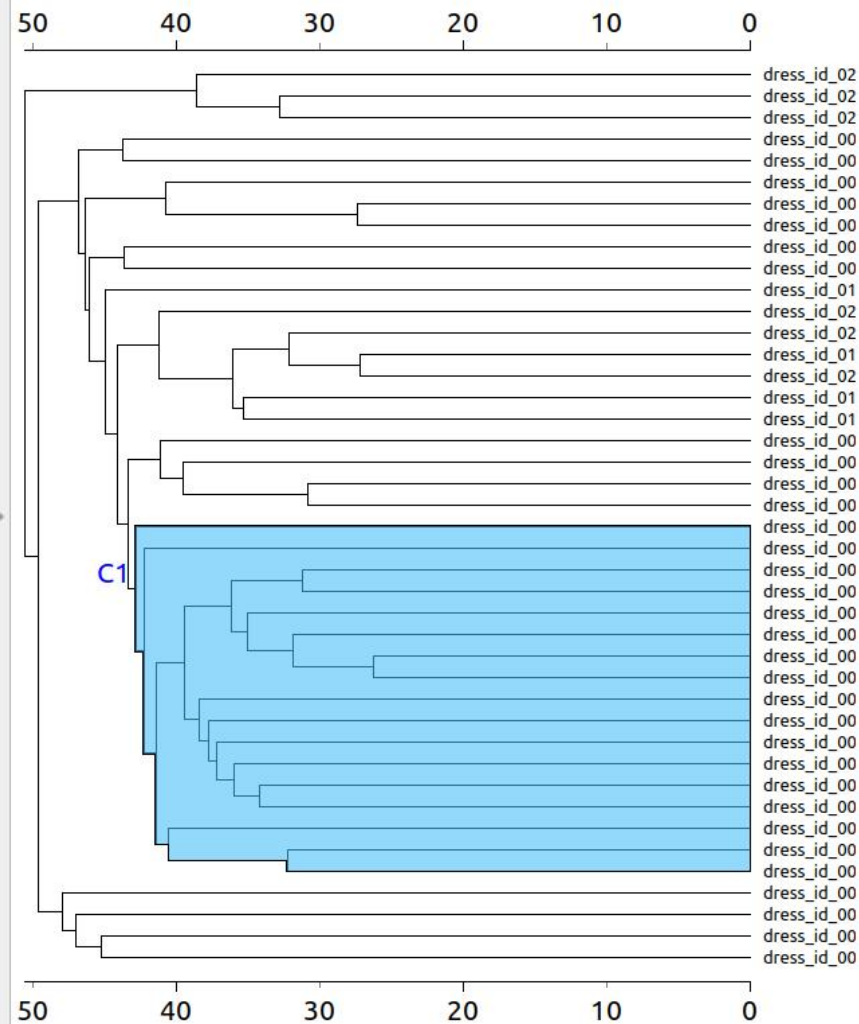
Pruning

☒ None☐ Max depth: 10

Selection

☒ Manual☐ Height ratio: 75,0%☐ Top N: 3

Zoom

☒ Send Automatically

42x42 17 | 42

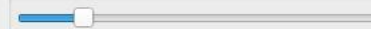
Image Filename Attribute

image

Title Attribute

category

Image Size



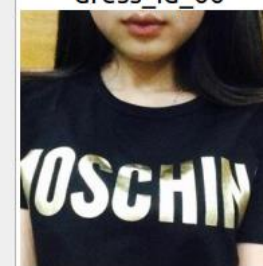
dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00



dress_id_00

☒ Send Automatically

17 - | 17

All the presentations will be available on GitHub!

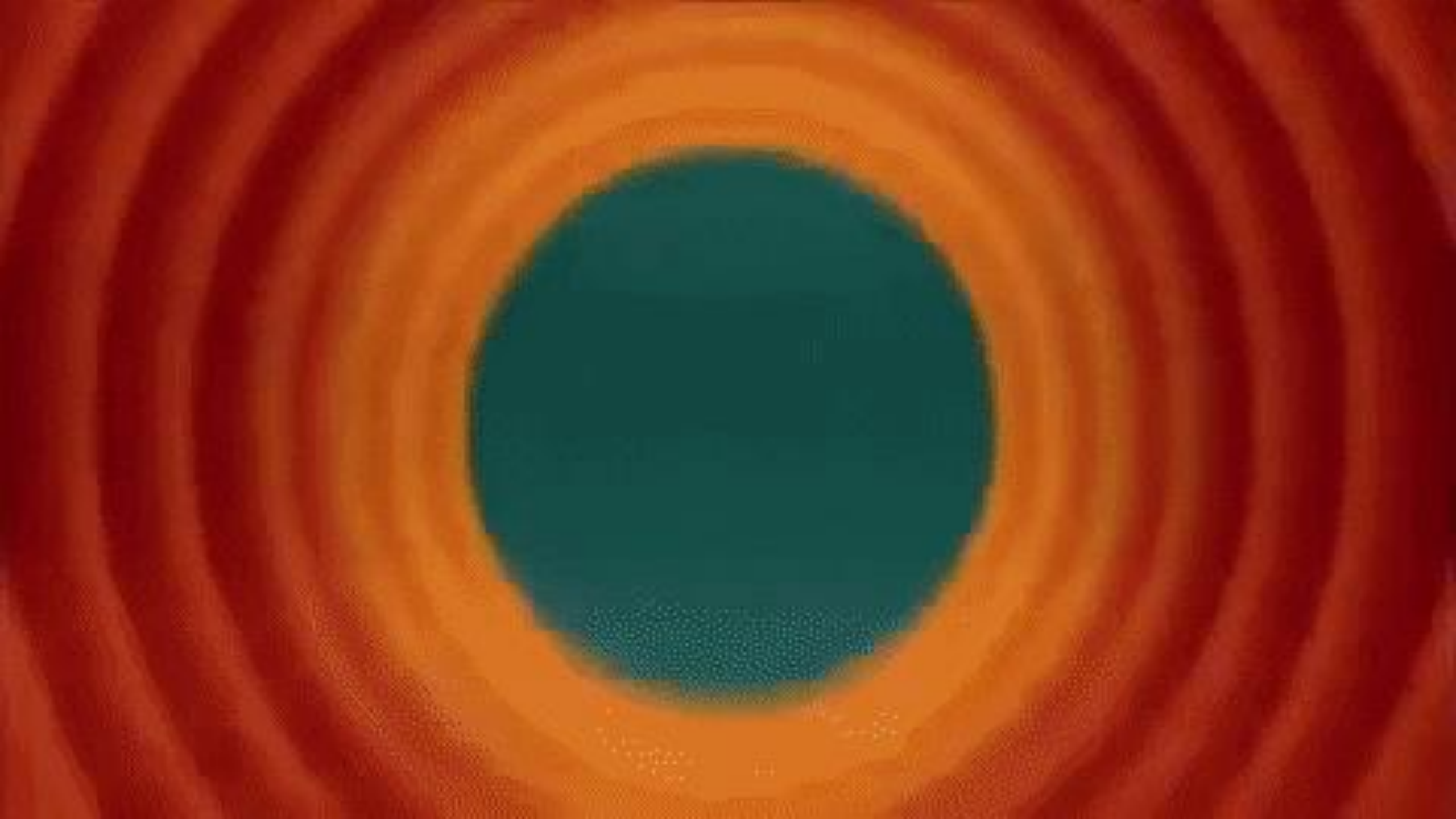
1. This is motivated by the fact that I want you to get some public merit for your work :)
2. It would be perfect if you would be able to use a little bit of Git and Github to let your name appear in the Github repository;
3. In any case, I will cite you in the project folder, linking optional personal 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).







ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Lorenzo Stacchio

Dipartimento di Scienze per la Qualità della Vita

lorenzo.stacchio2@unibo.it

www.unibo.it