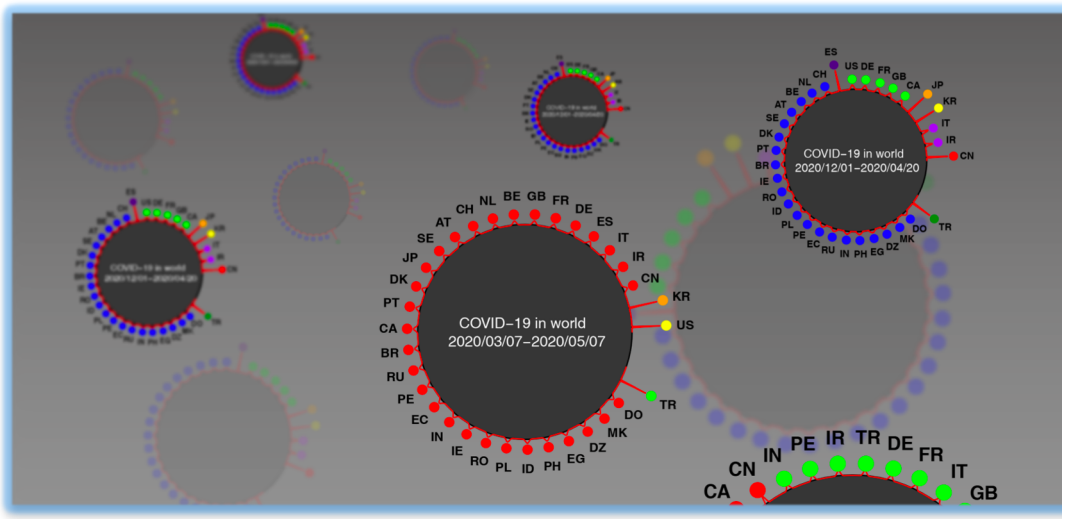
Working paper on graph clustering

Help documentation on using the features offered by the graph clustering system

Graph Clustering System (GCS)

Supplemental document

Version 1.0
December 24, 2020



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The GCS system and working paper are updated frequently, please check the latest version of GCS at http://graph-clustering-system.com/.
Detailed documentation of the corresponding data and code can be found on the GitHub repository: https://github.com/Meiqian-Chen/GraphCpClust.

Abstract

Graph Clustering System (GCS) is a free platform that provides users with graph clustering analysis, change point analysis and data fitting based on the clustering-segmented autoregressive sigmoid (CSAS) model. The platform not only reproduces the results of data analysis based on multiple datasets, but also serves as a tool to provide users with the corresponding data analysis.

Please cite: *SHI, X., CHEN, M.Q. & DONG, Y.C. Exploring the space-time pattern of log-transformed infectious count of COVID-19: a clustering-segmented autoregressive sigmoid model. arXiv. https://arxiv.org/abs/2102.13287*

Analysis of three datasets

This section shows graph clustering analysis, change point analysis and fitting analysis based on three COVID-19 datasets: 1. Our world in Data at https://ourworldindata.org/covid-data-switch-jhu , 2. WHO at https://covid19.who.int/, 3. Wuhan-2019-nCoV at https://github.com/canghailan/Wuhan-2019-nCoV). In our paper, only the last dataset, Wuhan-2019-nCoV, is analyzed in our paper.

Why did we analyze the Wuhan-2019-nCoV dataset? There are two main reasons here.

(1) We conducted a study of COVID-19 back in early March 2020. At that time, there were very few datasets on COVID-19, and especially few containing timely outbreak data from Chinese provinces. This Wuhan-2019-nCoV dataset was updated very timely at the beginning of COVID-19 transmission.

(2) The data quality of Wuhan-2019-nCoV dataset is trustworthy and has been included in the "Open Source Wuhan" data resource. The data about COVID-19 in each country are from WHO's epidemic reports, while the data about COVID-19 in each province of China are from the daily epidemic reports of provincial health and family planning commissions.

Missing data handling:

For these three datasets, we took the following measures for missing data. For some countries with missing early data, we replaced them with zeros; however, in the case of other missing data, the previous data of the series was used instead.

Data intervals:

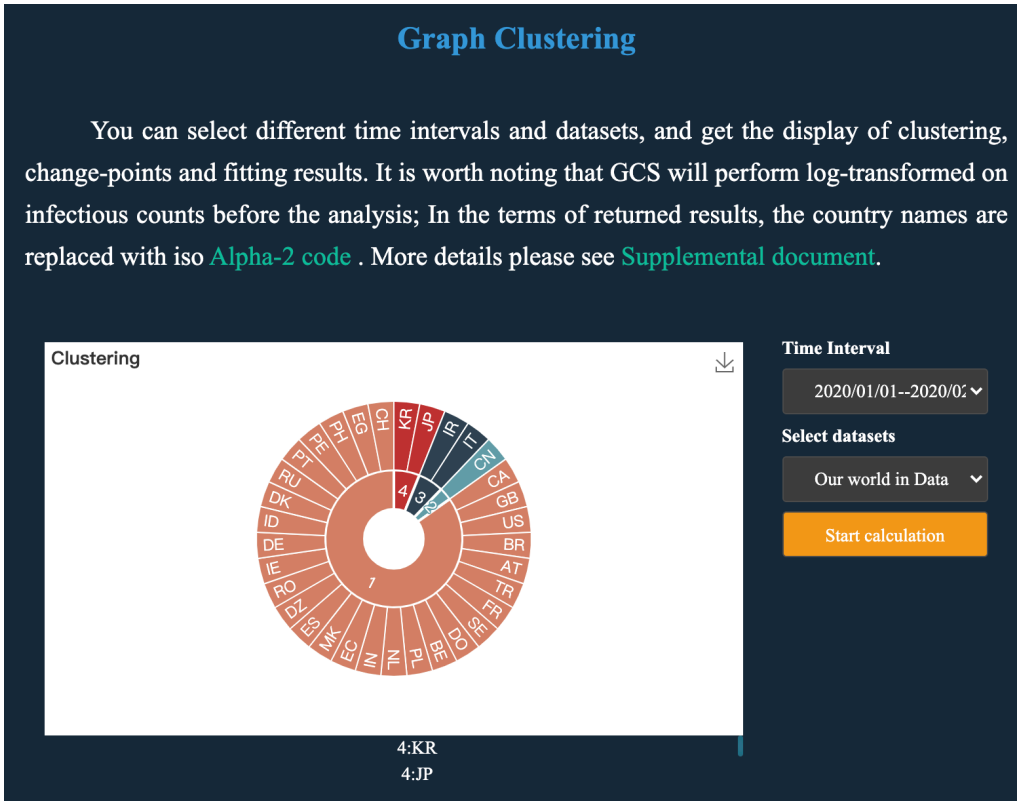
The data intervals for the three datasets considered are as follows.

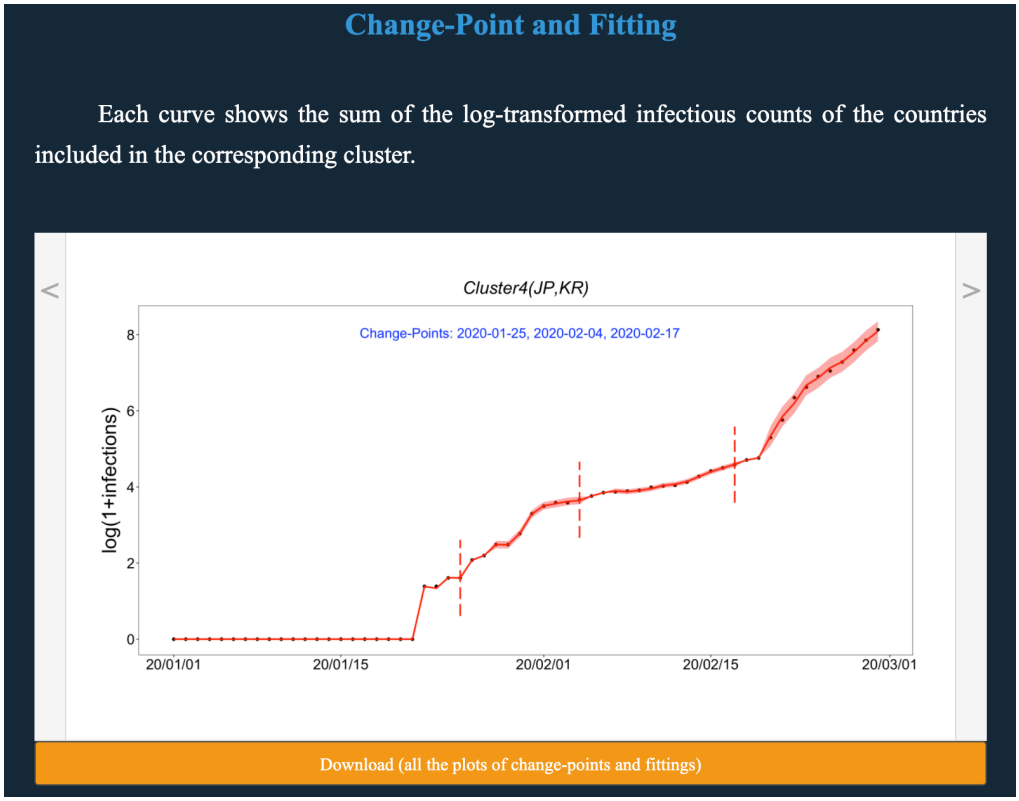
Our world in Data: 2020/01/01 to 2020/12/03.

WHO: 2020/01/01 to 2020/12/03.

Wuhan-2019-nCoV: 2019/12/01 to 2020/12/03.

A showcase for the clustering and change-point analysis of the epidemic data





Step 1: Please select a time interval that you want to show.

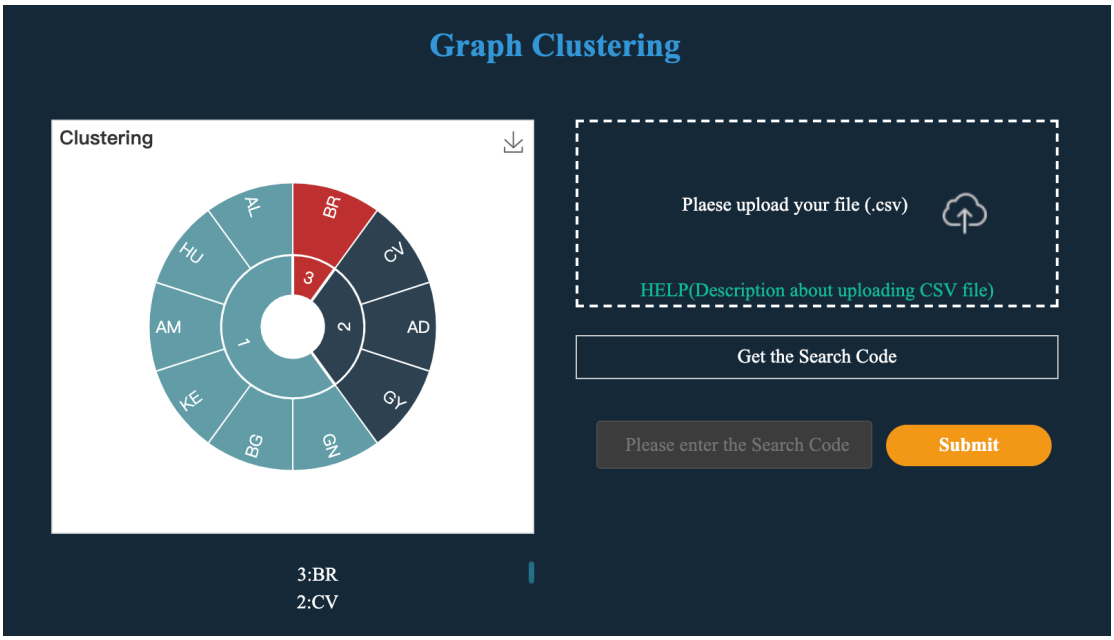
Step 2: Select a dataset from Our World in Data, World Health Organization and Wuhan-2019-nCoV.

Step 3: Click on the "Start Calculation" button to get the display of the clustering results,

simultaneously, a sigmoid curve of each cluster is also presented that share the form of multiple stages and multiple change-points.

Offline requests

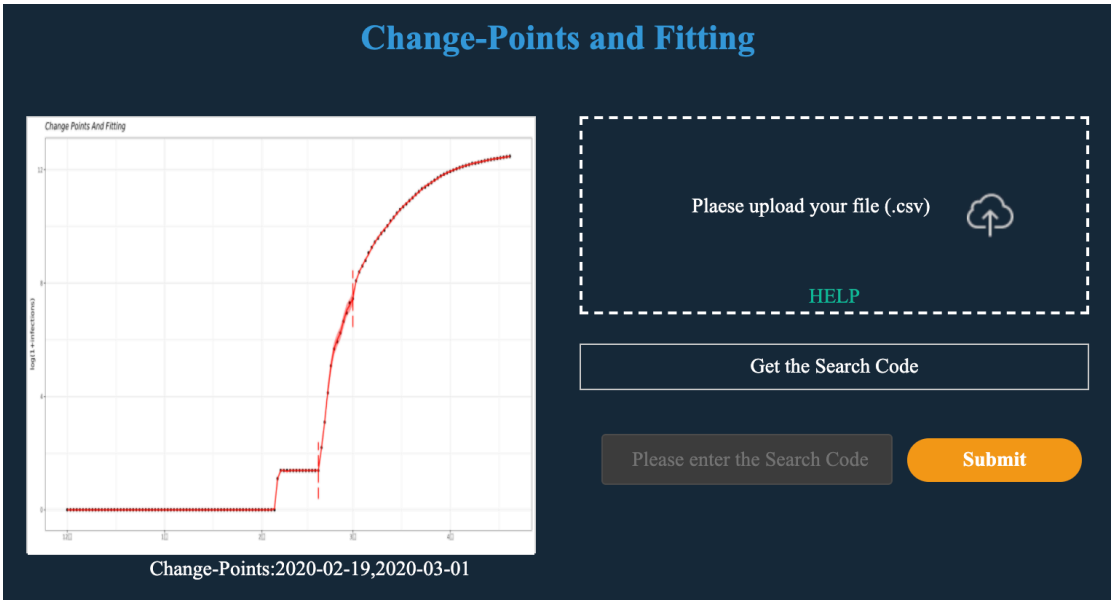
Steps for offline requests



Step1: Please upload your file, which must be in csv format. For details about uploading files, please see "Help (Description about uploading CSV file)".

Step2: After uploading the file, the "Search Code" for this request will appear in the "Get Search Code" window.

Step3: Then enter the search code in the "Please enter the search code" window and submit it to get the display of the clustering results.



Step1: Please upload your file, which must be in csv format. For details about uploading files, please see "Help (Description about uploading CSV file)".

Step2: After uploading the file, the "Search Code" for this request will appear in the "Get Search Code" window.

Step3: Then enter the search code in the "Please enter the search code" window and submit it to get the display of the change-points and fitting results.

Note: It may take longer to calculate the change points and fit the data, so you may have to wait a few minutes to get the corresponding Search Code.