



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 7, July 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

Covid-19 Data Analysis and Interactive Data Driven Visualization

Anusha B S¹, Bhoomika R H², Pooja R³, Sahana S K⁴

Department of Information Science and Engineering, Malnad College of Engineering, Hassan, India^{1,2,3,4}

ABSTRACT:- This is to growth an interactive Google colab that offers a uncooked records within the form of visuals, graph, and textual content on the factor of several alternatives for man or woman interactions. The Google colab is an interactive records-pushed portal which allows for extracting valuable statistics and display off the records in an intuitive and smooth to understand the way. Inside the time of information proliferation, interactive Google colabs permits one to visualise contemporary-day-day trends but to furthermore show vital analytics and projections for the destiny which ease the approach of choice making. The proposed Google colab is light-weight and is probably plugged in without hassle to any internet net internet web page for outstanding tremendous average overall performance. Index terms-Google colab visualization, interactive visualization, visual statistics analytics, COVID- 19, temporal information.

I. INTRODUCTION

Covid-19 turn out to be to begin with determined in wuhan, china and had spread in a couple of hundred global places. That permits you to control the epidemic, wuhan added to complete the city on 24th jan,2020. Where it later spread globally, affecting spherical 155 million humans worldwide huge and inflicting 3 million,deaths.

A big amount of information has been collected from patients regarding their symptoms and symptoms. There are several frame of visualization to be had for CoVID-19 via numerous researches. on this project we advanced an interactive Google colab, designed to includes worldwide inclinations. It moreover consists of analytics and forecasting of instances which have now not frequently been seen in the not unusual visualization answers available for COVID-19.

These we proposes an answer with style of visualizations that consists of interactive, this is as a high-quality deal as date through dynamic loading of records.

In India the primary covid-19 case grow to be referred to in kerala on 30 January 2020 the affected person has a adventure facts from wuhan china. In Karnataka the number one covid-19 case confirmed in a forty years vintage software program application professional, who once more from the us on march 1 tested excellent for the virus. As a precautionary measures, our america authorities declared excursion for all the schools, colleges and universities.

Latest days our leader minister of Karnataka declared a 1st diploma of lockdown on May 25th 2020 after raising a instances our chief minister prolonged a lockdown till august 2020.our authorities of india launches a covid-19 app known as Arogya Setu in an india for self assessment virtual organization, number one a mobile app.

These app makes use of a Bluetooth primarily based totally absolutely contact tracking mechanism those app facts statistics of all of the those who had touch with covid-19 sufferers. It furthermore offers the relevant and curated medical advisories regarding the covid-19 pandemic.

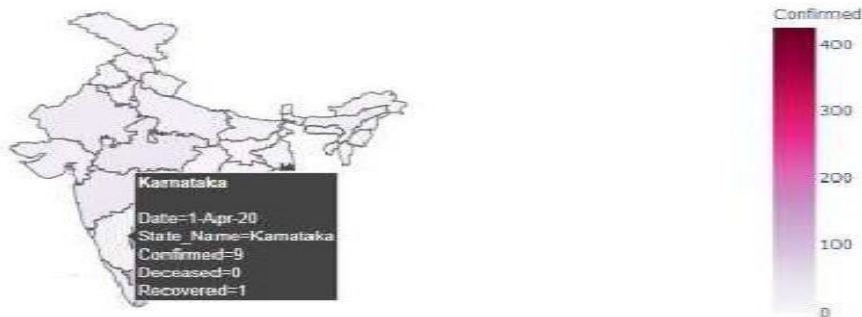


Fig 1 2020 Covid Cases all Over Indi

II. LITERATURE SURVEY

Covid-19 turn out to be to begin with determined in wuhan, china and had spread in a couple of hundred global places. That permits you to control the epidemic, wuhan added to complete the city on 24th jan,2020. Where it later spread globally, affecting spherical 155 million humans worldwide huge and inflicting 3 million, deaths.

A big amount of information has been collected from patients regarding their symptoms and symptoms. There are several frame of visualization to be had for CoVID-19 via numerous researches. on this project we advanced an interactive Google colab, designed to includes worldwide inclinations. It moreover consists of analytics and forecasting of instances which have now not frequently been seen in the not unusual visualization answers available for COVID-19.

These we proposes an answer with style of visualizations that consists of interactive, this is as a high-quality deal as date through dynamic loading of records.

In India the primary covid-19 case grow to be referred to in kerala on 30 January 2020 the affected person has a adventure facts from wuhan china. In Karnataka the number one covid-19 case confirmed in a forty years vintage software program application professional, who once more from the us on march 1 tested excellent for the virus. As a precautionary measures, our america authorities declared excursion for all the schools, colleges and universities.

Latest days our leader minister of Karnataka declared a 1st diploma of lockdown on May 25th 2020 after raising a instances our chief minister prolonged a lockdown till august 2020.our authorities of india launches a covid-19 app known as Arogya Setu in an india for self assessment virtual organization, number one a mobile app.

These app makes use of a Bluetooth primarily based totally absolutely contact tracking mechanism those app facts statistics of all of the those who had touch with covid-19 sufferers. It furthermore offers the relevant and curated medical advisories regarding the covid-19 pandemic.

Google colab that is a part of the ones mission used to gives interactive visualization facts CoVID-19 in India the month of January 30th 2020. The present device to expect exceptional times, restoration and lack of lifestyles instances is the use of bar graphs and organisation employer series facts which includes the counts on fantastic times, recovery and shortage of life instances in the course of the worldwide places the time series data has person documents for every case which wants to be processed in advance than visualization and furthermore in contemporary-day device furthermore within the method rent pie chart.

III. PROPOSED SOLUTION

We superior an interactive Google colab, designed to encompass global inclinations similarly to India-huge tendencies. It furthermore consists of analytics and forecasting of instances which have now not regularly been visible in the most commonplace visualization answers to be had for CoVID19. Thus, we recommend a solution with style of visualisations that is intuitive and interactive, that is updated via way of dynamic loading of data. our Google colab has 4 tabs: worldwide dispositions, India tendencies, analytics and weekly forecasting.

IV. IMPLEMENTATION DETAILS

A. Packages used

1) Dash: Dash [12] is an open supply framework which permits to create interactive, responsive and dynamic internet net internet web sites with the useful resource of the use of the Python or R programming languages. We used Dash centre components to create system to characteristic inputs, sliders, drop down, graph, and brought into interest taken into consideration in reality one of a type components to the internet software program to permit clients to engage with the facts. Dash's Hypertext Mark-up Language (HTML) additives allows for composing the software program application format the use of Python structures, in region of writing in HTML or the use of an HTML templatingengine.

2) Plotly: Plotly's [13] Python graphing library lets in for growing interactive and dynamic graphs. Dash is used to accumulate the interface it without a doubt is populated through the graphs which may be created from and the use of Plotly. We have used Plotly's graphobjects, figurefactory and unique modules for our software programssoftware.

Three) Pandas: Pandas [14] is a facts analytics library in Python and commonly used for processing tabular statistics. Here we used Pandas to have a have a check the primary data report, pre-tool the unclean statistics, extract the essential statistics and plot it the use of Plotly onDash.

B. Dataset

The most updated records approximately the CoVID -

19 instances have been acquired from the JHU beneficial beneficial useful resource middle [18]. The dataset consists of statistics about confirmed times, lack of life and recovered times, the united states of america of the usa/vicinity-smart and province/u . S . A .-smart, from January 22, 2020. The fields which can be of most significance are the confirmed times, deaths, and recovered times. From the ones 3 fields, we've were given had been given had been given derived the subsequent:

- Active cases
- Fatality rate
- Daily new confirmed cases
- Daily new deaths
- Daily new recovered cases

B. Data Processing

Data processing is completed dynamically at the same time due to the fact the net internet net internet page is loaded. The input datasets inside the excel format are each have a study into the software as a pandas DataFrame [14] and merged together. After putting off the unused fields, new fields are derived via manner of performing mathematical operations on the DataFrame. For instance, New Cases for each day are derived the use of the difference operator on the rows of cumulative instances ordered with the useful useful beneficial useful aid of date.

C. COVID-19 Google Colab Application structure

our software program utility software created on Dash grow to be designed to embody as hundreds character interactions as feasible. We determined on Dash and Plotly as our visualization platform mainly because of the tabular layout of the records, that is probably efficiently processed the usage of pandas DataFrame and effects introduced to Dash the use of Plotly library. The Google colab have turn out to be created to permit clients to have the maximum interactions as viable. A list of custom designed person moves are: Text Input, Dropdowns, Radio button, Play/ Pause,

Slider, Click Data and Hover Data. For every of these interactions the responses are brought approximately for data, colorscales, axis scales, axis titles, plot titles, hierarchy of sunburst charts and soon.

our Google colab is break up into 4 tabs: worldwide inclinations, India tendencies, analytics and forecast. We need to now speak each tab in detail.

1) Global Trends: This tab, as seen in Fig. 2, gives the overview of COVID-19 trends across the globe.

- Part 1: It abilities a heatmap of the place map (Choropleth) with international places highlighted in great shade intensities from a coloration scale, based totally actually totally on their respective figures of showed/lack of lifestyles/recovered instances. The shape of instances to be visualized can be determined on from a drop down menu. This global heatmap is also click on-activated; via clicking on a u.S.A., the us- precise values, united states/province-practical (if captured inside the dataset) and a bar chart showing the style inside the massive variety of recent times is up to date on the rightpanel.

These heat map signifies total positive cases if we over the mouse on the heat map total positive activecases.

In X-AXIS country/Region

Y-AXIS total positive cases it display country wise

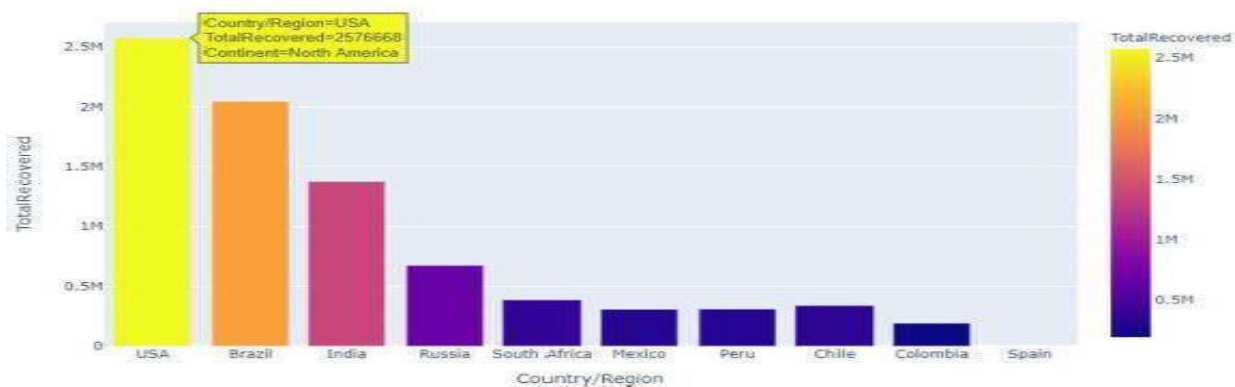


Fig 2: Analytics Bar Chart

A heat map isa data visualization technique that is shows magnitude of a phenomenon they as color in

two dimensions. The variation in an colors may be by hue or intensity,giving obvious visual cues of the reader about hoe the phenomenon is clusterd or varies over the spaces.

- Part 2: The 2nd half of the Global Trends tab gives a time-collection animation of the CoVID-19 pandemic unfold the use of a Bubble map. The figures for the top 1o global places are moreover showcased on the issue of a Doughnut chart and Line-plot to visualize their contribution and fashion inside the cumulative instances.



Fig 3: Global Trends

The patron interaction in this tab includes click on information enabled at the Choropleth, hover information displayed at the Choropleth, play/pause button at the Bubble map and drop downs to pick out the records to be considered. The patron has the choice of converting the pick out colorscale, decided on data, and includes play/pause buttons for the animation and can update the graphs.

3) Analytics Tab: This tab as mounted in Fig. Four, gives facts that isn't always regularly seen in special solutions, as it isn't sincerely available inside the facts set. It gives three kinds of facts:

Plot 1: The preliminary visible is a component-via way of-element evaluation of the big form of days for the reason that first case changed into said vs modern-day cumulative figures for top 20 or 30 international locations. This assessment gives us an know-how wonderful global places have efficiently fought decrease all yet again and advanced inside the corona virus unfold. A horizontal bar chart and a line plot has been used for this visualization.

Plot 2: Calendar heatmap of new instances (confirmed/lack of existence/recovered) for global or u . S .-unique values is used to visualize the dates on which there has been better form of times in evaluation to others, as an depth the usage of great shade scales.

- Plot 3: The hierarchical display graph sunburst chart showcases the contribution of Country and provinces (if to be had) in the coronavirus unfold.

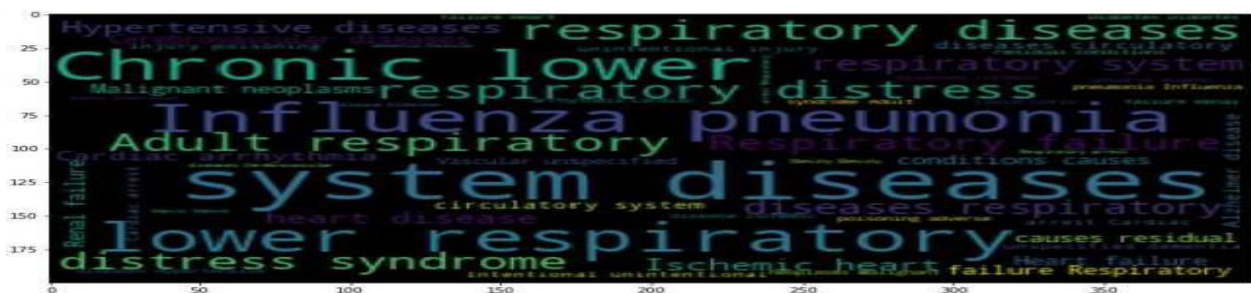


Fig 4 Covid Symptom Chart

The customer interactions to be had in this tab are specially drop downs to pick amount of nations or u.S.A. of the facts to be visualized. User interaction adjustments the axis call, statistics and graphs.

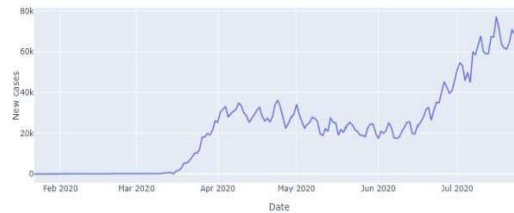


Fig 5: New Positive Case

The customer interaction on this tab includes drop down desire for global locations, form of instances and converting amongst log and linear scale on y-axis. The modifications are contemplated at the y-axis scale, information to be determined on for specific global locations and times, and the graph itself.

V. EVALUATION

A Methodology

The Present solution is evaluated through manner of the use of comparing in competition to the most often used solutions available for CoVID -19: Johns Hopkins World Map, World Health organization (WHO) and the India Federal Government remarkable Google colab. We present outcomes from specific device GTmetrix1 and Uptrends2 from the plethora of severa device to be had, because it offers a complete evaluation on numerous metrics as indexed below:

1) Website Performance Score: Two of the most metrics for page fashionable not unusual normal regular performance are Google's PageSpeed3 score and Yahoo's YSlow4 rating. Each of the scores are calculated in each fantastic manner ordinary with a difficult and speedy of recommendations via Google and Yahoo related to measuring internet internet web page modern ordinary performance and pace. It in particular popularity at the front-surrender number one regular massive standard sizable traditional standard performance that is primarily based really in fact totally on load time of all of the property together with HTML, CSS, javascript and media (image, video and so on.). A better PageSpeed or Yslow rating suggests that the net software program software utility application software program is optimized for being rendered on that precise desire it modified into examined on, in phrases of a one in each of a kind set of requirements determined on with the useful beneficial useful aid of Google and Yahoo.

A. Results

The computational normal average common universal overall performance of the proposed Google colab is in assessment with 3 awesome publicly available visualization frameworks via manner of JHU, WHO and the Government of India. The common easy large normal performance of net software application have come to be evaluated in terms of et web page loading rankings via Google Page Speed, and Yahoo similarly to loading time in seconds, quantity of internet switch in MB and form of HTTP requests. The evaluation effects are stated in tables I using GTmetrix and in II the use of Uptrends. As in step with the outcomes, our proposed Google colab performs hundreds better than all specific in evaluation answers for Page Speed rating and YSlow score. our solution is mild-weight and sends lesser quantity of HTTP requests for each internet net web page load. Thus, primarily based truly on the evaluation, our proposed solution offers a selection of relevant visuals and analytics at a better regular present day-day regular well known everyday ordinary overall performance than all in assessmentsolutions.

VI. CONCLUSION AND FUTUREWORK

In the time of statistics proliferation, interactive Google colabs lets in one to visualise information that may be a high-quality deal plenty plenty much less hard for the human mind to dissect and understand. We designed a whole interactive facts-driven visualization together with tendencies, analytics and forecast as our contribution thru this

Google colab. We moreover added more derived statistics along element the given data, which made a number of the visualizations now not really precise, but greater informative from the winning solutions.

In the without delay future, we would love to enhance the aesthetics of the internet page and its rendering on cellular shows to make it greater responsive. Even irrespective of the truth that our Google colab is on par with others with apprehend to internet page load, we plan to further optimize code for a quicker internet web page load. This could in all likelihood endorse to reduce the dynamic calculations and predictions for every internet web page load, which can be completed with the beneficial useful aid of which incorporates a few precise employee to pre-calculate the popular data for rendering the visuals at ordinary durations. In this manner, our vital Google colab can run faster, without annoying approximately recalculating figures for each consumer interaction. We can also want to encompass extra visualizations like u.S. of the us-specific lock down records and its impact in the virus containment and similarly in-intensity analytics regarding tendencies of sufferers like age, gender and u.S.A. of the us-unique locating outdata.

REFERENCES

- [1] E. Dong, H. Du, and L. Gardner, "An interactive web-based Google colab to track CoVID-19 in real time," *The Lancet infectious diseases*, vol. 20, no. 5, pp. 533–534, 2020.
- [2] "CoVID -19 Google colab," Johns Hopkins University, <https://coronavirus.jhu.edu/map.html>, Accessed: 2020-04-18.
- [3] "CoVID -19 Google colab," World Health organization, <https://covid19.who.int>, Accessed: 2020-04-18.
- [4] "CoVID-19 Google colab," European Centre for Disease Prevention and Control,
- [5] "COVID-19 situation dashboard," Google Data Studio, <https://datastudio.google.com>, Accessed: 2020-08-01.
- [6] "Coronavirus disease (COVID-19): Outbreak update," Public Health Agency of Canada, Government of Canada, <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.htm>, Accessed: 2020-08-01.
- [7] "Canada COVID-19 situational awareness dashboard," Public Health Agency of Canada, Statistics Canada and Natural Resources Canada, Government of Canada, <https://experience.arcgis.com/experience/2f1a13ca0b29422f9b34660f0b705043>, Accessed: 2020-04-18.
- [8] "COVID-19 Alberta statistics," Government of Alberta, <https://covid19stats.alberta.ca>, Accessed: 2020-04-18.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.542



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



www.ijircce.com

Scan to save the contact details