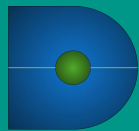


DIGITS

D.I.G.I.T.S stands for Drone Imaging Geographical Interface Transit Satellites

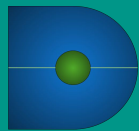


What is DIGITS?

Digits is a web application that provides Urban planners all the relevant satellite drone and other information that they need to plan public transportation .

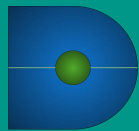
Digits would help the Urban planner by helping them find the data that is relevant for their public transportation planning such as Drone images, Population density, and predictive data etc.

Digits is an easy to use web application, enabling the Urban planner to add modified layers, access external and relevant data such as weather, real estate, pollution etc. In Digits they can find all the information at one place.



Why Digits?

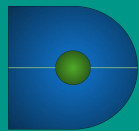
Digits provides easy access to specific data layers that help Urban planners to plan transportation access to the public. We used Jupyter notebook and Python to modify interactive map layers from ArcGIS. The layers are optimized to be simple, easy and interactive to use for Urban planners. Our maps can help planners decide what the most important areas to build public transportation are. Digits can help you see the accidents based on the area selected, traffic data, air pollution data, etc. We hope to make the Urban developers' jobs much easier by optimizing and consolidating data, and adding additional tools that can give more information. The benefits over competing softwares is that DIGITS is easier to use and that you only need to click one layer.



How we Used NASA data

Our Space Agency Data:

We used air pollution data for California from NASA. We believe that this piece of data is incredibly important, because traffic and accidents can be somewhat relieved by building new roads. However, that would not alleviate air pollution, which can quickly build up to levels that can cause chronic illnesses. Optimizing public transportation using air pollution data along with other data can significantly help with that. Combining air pollution data with traffic data helps plan public transportation much more effectively.



How is DIGITS implemented?

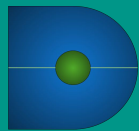
How it works: To modify the maps, and make them more streamlined and easier to use, the feature layers are turned into a Pandas dataframe and modified in ArcGIS Python API using Jupyter Notebook. Afterwards, the data is converted to a csv format and downloaded, then uploaded locally to arcGIS. Finally, the map with that layer is embedded in the website.

For the “predictions” layer, we would use actual prediction generated by AI/ML. For the prototype, data is modified randomly to seem as if it is predictions, but in the real web application(not this prototype), there would be actual AI used to generate predictions. Once the data is modified, it is once again uploaded the same way as before.

For the high risk maps, we dropped all the values except for latitude, longitude, and number of accidents; then grouped the data by those columns after rounding them to the nearest tenth, then uploading it the same way. This high risk map is currently only for traffic accidents, but the vision is for the high risk map to be based off of which areas have the most traffic accidents, traffic count, population, worst air quality, etc.

In the web application, we have picked the most relevant charts for the Urban planner to visualize. Clicking on a map will embed that url in the web app (which is a bit inefficient, but it works for the prototype). The drone data is a drop down menu with pictures of different cities in LA county.

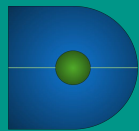
The communicate tab is a chat window to communicate with the admin.



What resources we used

- Resources

- Coach
- Stack Overflow
- Youtube NASA SpaceApps Challenge channel
- ArcGIS API documentation
- W3 schools
- Pandas documentation
- Istock



What tools we used

- Tools

-HTML

-Python

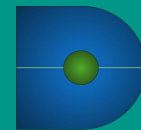
-Pandas

-JavaScript

-Google Sites

-ArcGIS

-Jupyter notebook



What DATA did we use/create?

istock photos

arcGIS layers:

Vehicle Accidents in the City of Los Angeles __ WFL1-<https://www.arcgis.com/home/item.html?id=d60deea317994373b6a539e3f166c4e7>

Traffic Counts-<https://www.arcgis.com/home/item.html?id=a27ad0d462f74efb92bfa230e5f64239>

LA County Total Population by Census Tract-<https://www.arcgis.com/home/item.html?id=038615b070f04e6fb96d8c51f90813a3>

Space Agency Data: Tropospheric Nitrogen Dioxide (NO2) Column Density (TROPOMI) in California in Response to the COVID-19

Pandemic-<https://www.arcgis.com/home/item.html?id=0142988a116744ba83c6b82117985973>

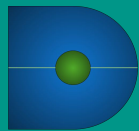
Edited layers:

[traffic_accidents](#)-edited traffic accident data

[traffic_accidents_predictions](#)-faux accidents predictions

[traffic_accidents_high_risk](#)-high risk accidents data

[traffic_counts](#)-traffic counts data, trimmed down for prototype



Links

Code link

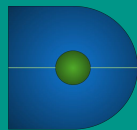
<https://github.com/AkshajC/nasahackathon>

Digits Demo link

<https://www.youtube.com/watch?v=OaaQ2TYbC9Y>

Digits Web app link

<https://www.urban-digits.com/>



Our Hackathon Adventure

We enjoyed learning together as a team and working with one and another. The reason we wanted to choose the challenge is because we know that it's a hard topic and that it's not a developed area so we wanted to help Urban developers

Here are some quotes from our team members:

Akshaj: It was a very exciting and tense experience.

Om: Everyone was nice and I enjoyed the challenge.

Saketh: It was tragic and full of heartbreak.

Jibran: My space apps experience with large scale projects and It was fun to do with my friends from school.

Avi: It was cool and there were times where it got a bit stressful but overall it was fun.

Athiksh: I liked working with my friends for a project that we tried a lot on.

Akshaj: I learned how to work with ArcGIS api and edit map data with python.

Jibran: I learned how to create a website and program with HTML/JavaScript.

Saketh: I learned how to be patient with my teammates and how to embed jS on a website.

Om: I learned about topographical map and ArcGIS and the type of coding in Digits

Athiksh: I learned how to understand what devs were coding. And how to bring the benefits for Digits

Team: One of our team members really wanted to do this project, because we wanted to be on the same page.

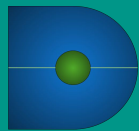
Team: So basically we splitted the pieces that would be in each other's expertise then we came up with different epics and goals that made Digits easier.

Athiksh & Om: We had a challenge when we were trying to find out what the developers were doing so we had to overcome this by having kind and sweet team members explaining this to us.

Saketh & Jibran: We need to understand how to embed JavaScript into HTML. They used experts and websites.

Avi & Akshaj: We were having issues uploading edited layer data, we overcame that by using an alternate situation by locally downloading files then uploading them to ArcGIS. And has too many files for ArcGIS to load. We solved it by cutting down the file size.

Team: We would like to thank our coaches for staying with us and putting up with the challenge.



Hashtags

#UrbanDevelopment, #UrbanPlanning, #DroneImaging, #SatelliteImaging, #PublicTransportation,
#NASASpaceAppsChallenge2021, #SustainableDevelopment

Goal

To Create a web application that can display information using Archi on a map. To integrate a variety of data sources providing information in an easy usable tool for urban planners. The web application will enable urban planners to view and analyse large amounts of data in order to better understand where public transportation is needed. The web application will provide a unified view of data such as Archi traffic accidents, current public transportation usage in the area, population density, traffic count. In addition to this, urban Archi developers will be able to request and use corridor mapping through drone services, and any other relevant data such as population density, real estate, weather, point of interest, etc.

DIGITS Team!

