Distributing a Fleet of Drones over an Area with No-Fly Zones

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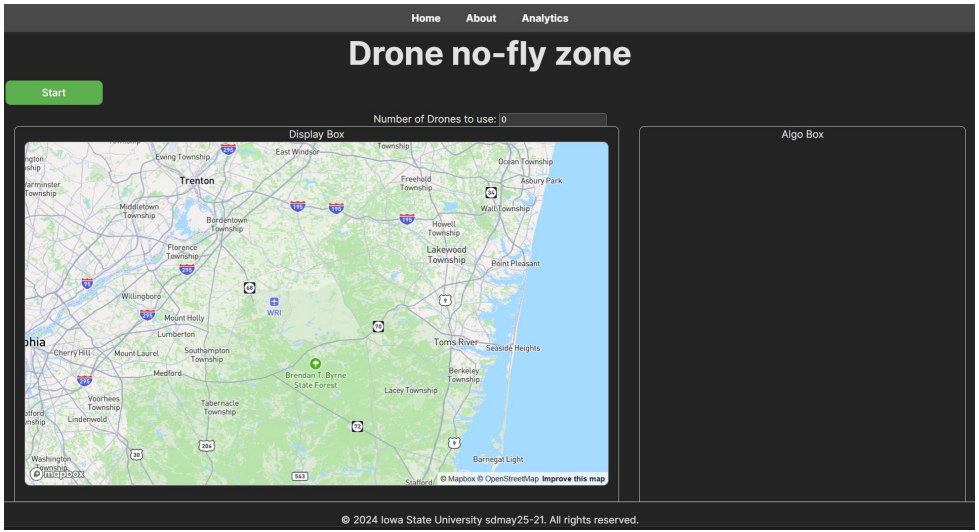
Project Overview

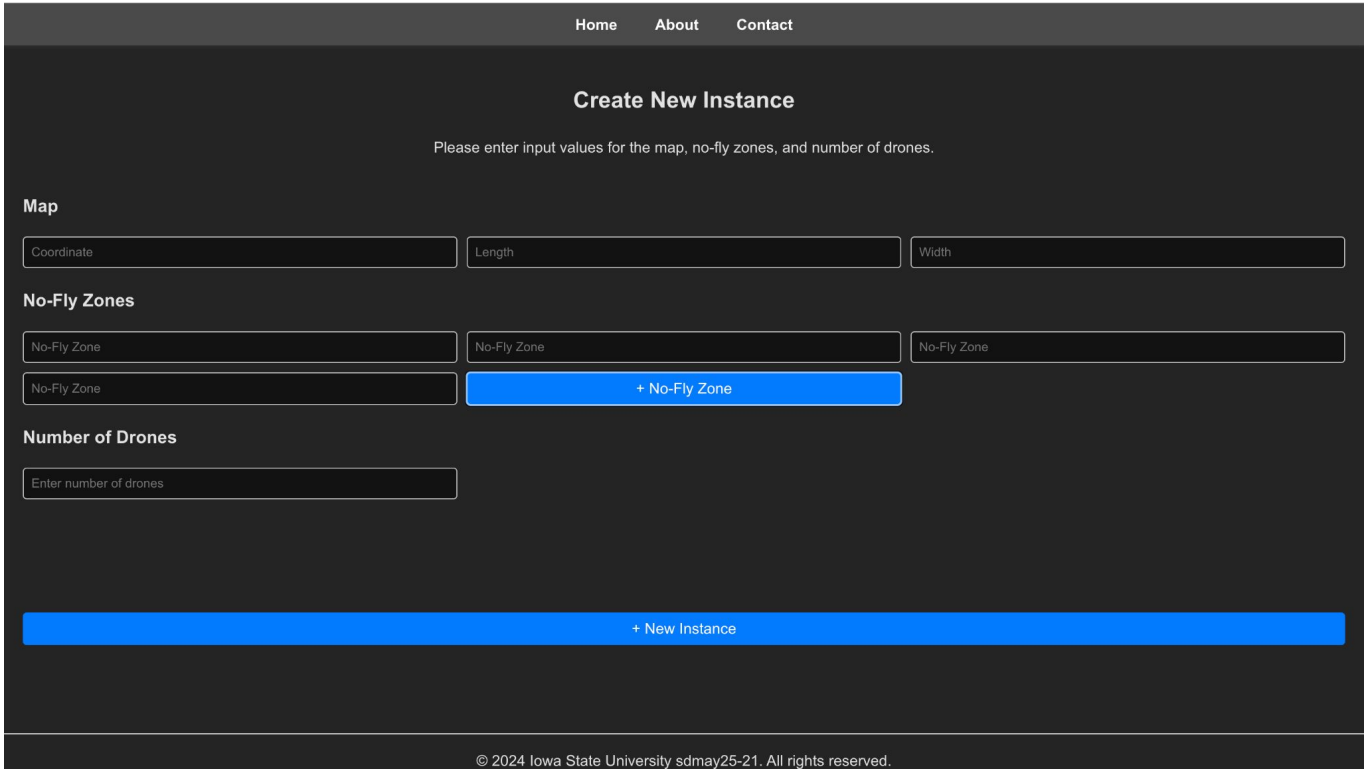
- Goals:
  - To be able to give a UI to users that displays their drones interacting with their points of interest for whatever reason they have given.
  - Have drones fly in a shortest path to certain events while ensuring that they get around no-fly zones.
- Importance:
  - Many drone users currently have to manually use them to respond to events, we will automate this so that drones can instantly perform the jobs needed.
  - Rather than users controlling drones one by one they can now have all of them move at the same time assuming there are multiple events happening simultaneously.



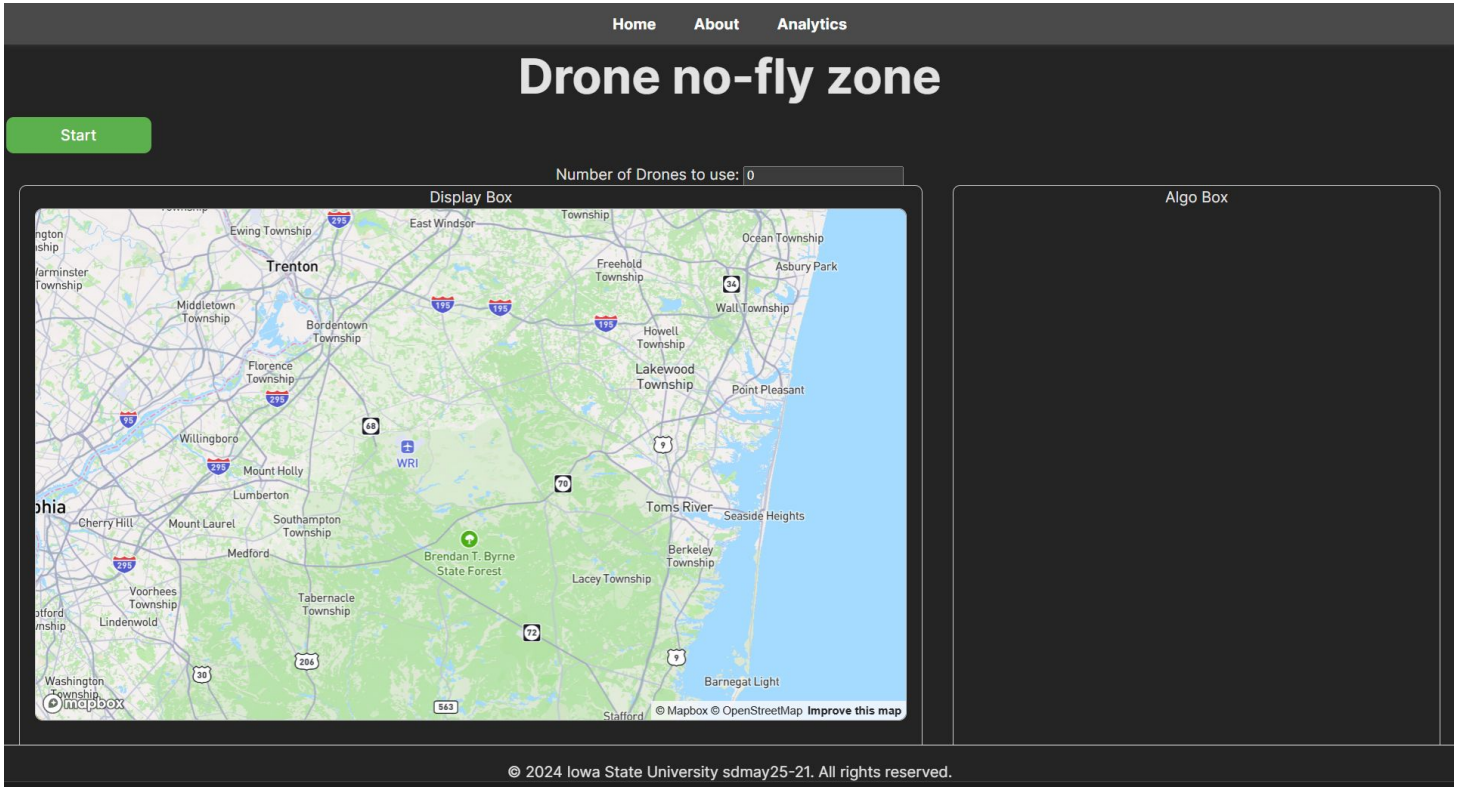
Setting the stage

- The purpose of this prototype is to demonstrate how users will be able to insert data to our system, as well as be able to see their drones on their selected map region.
- This is somewhat in the middle of our design story. In essence what is here is the entire frontend, we are simply just in need of the PhD student's pathing and partitioning code in order to make our backend. When we get the backend we will be able to update data on the frontend in real time.
- From this we are trying to learn what will be the best possible UI that the user can utilize for our task. With many different inputs, and tons of different regions and drones available, the goal is to give as much customization as possible as easily as possible.

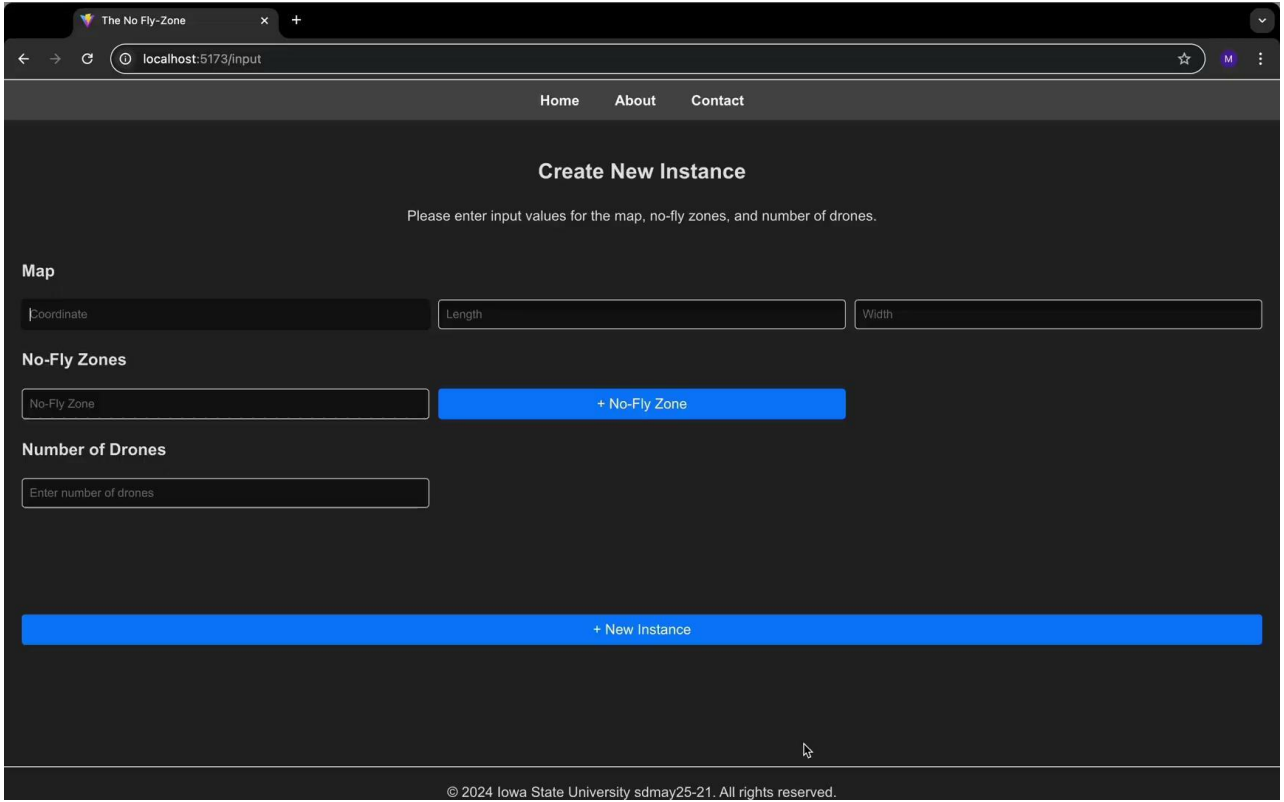
Prototype: UI



Prototype: UI



Prototype: Video



Reflection

- From this prototype we have learned what users like and do not like when interacting with our systems. It seems to be easier to have two separate screens (one for data input since we have so much, second for the actual display)
- It worked much better in order to have these two separate screens, with just one it got far too cluttered and also became difficult to select the region they wanted to use.
- It was also beneficial to take in another application known as MapBox to display the map for us. When we were trying to just take larger pictures, it became way to difficult. With MapBox we are able to have the user not only put in coordinates, but just move their cursor to the region they want to use as well.

Next Steps

- Improve visual appearance and accessibility of the UI
- Integrate the UI with the provided algorithm
- Setup backend for handling geospatial data and processing
- Create a Model-View-Controller (MVC) like pattern for communication between frontend and backend