User Needs and Requirements

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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.

Instead of doing something like this…
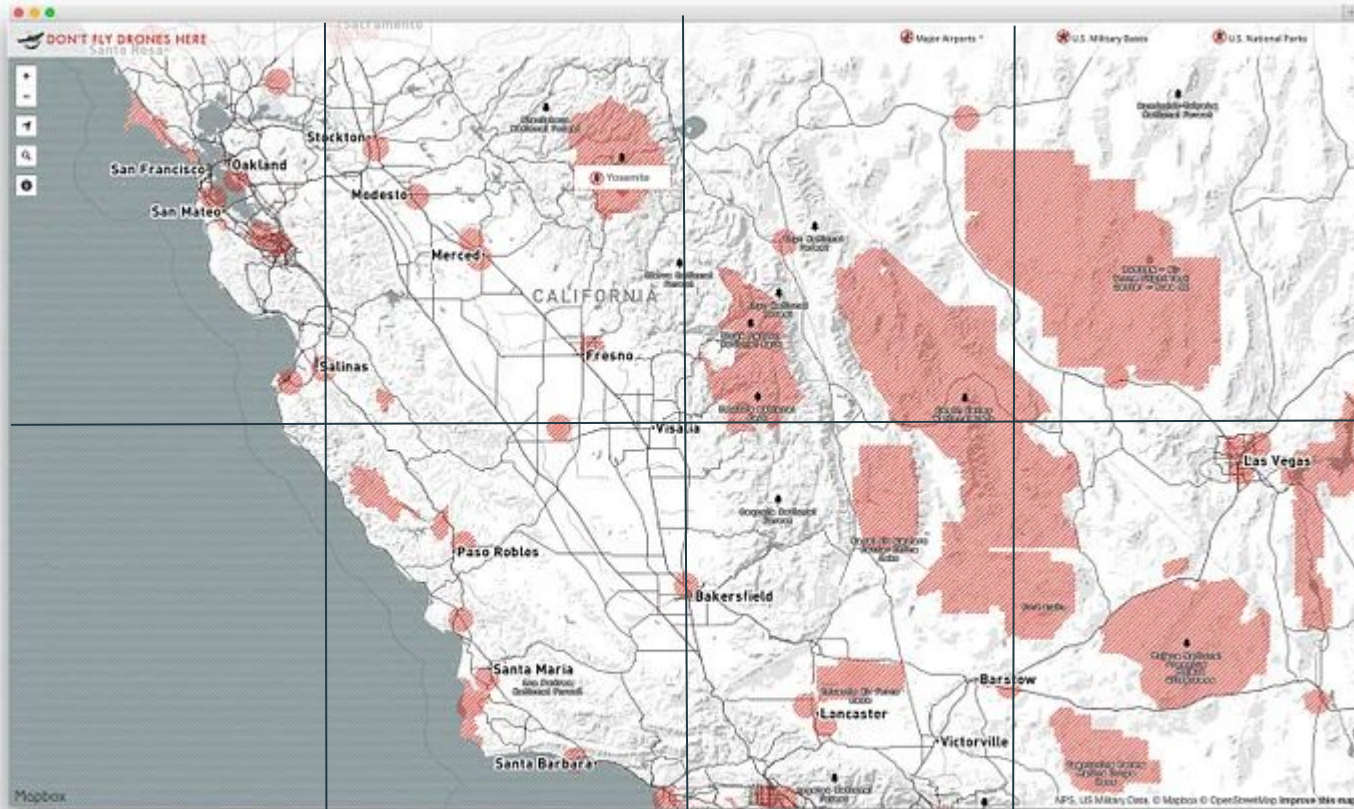
Do something like this to optimize response times

https://blog.mapbox.com/dont-fly-drones-here-928dee4389e8
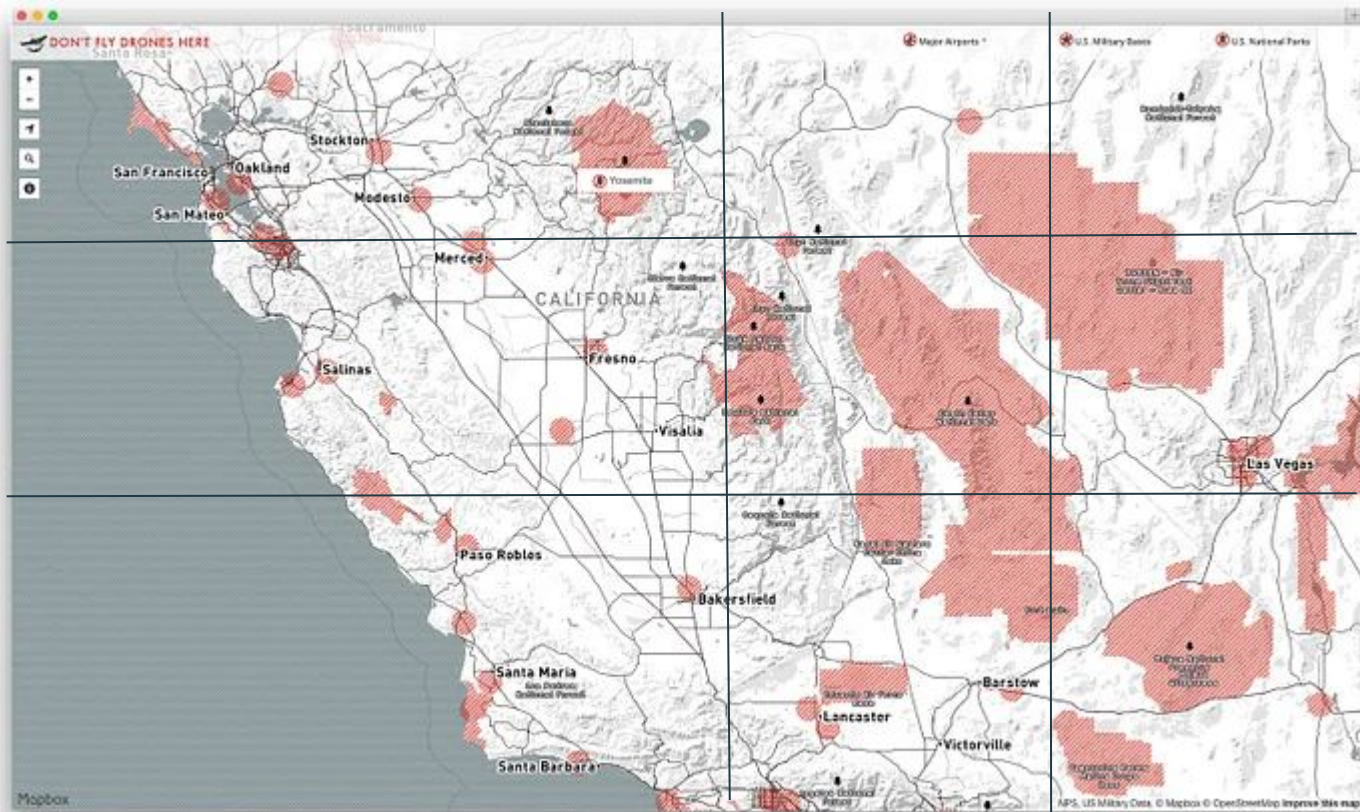
User Needs

- Users need to be able to see the drones move in real time
- Users need to be able to give a set of drones they want to use as well as a region they want to have the drones operate in and a data set of no fly zones
- Users need to be able to see algorithm data in real time as drones are moving
- Users need to be able to see the partitioning process (split the map based on no fly zones) in real time
- Users need to be able to tell the systems where and when events are happening for drones to respond to
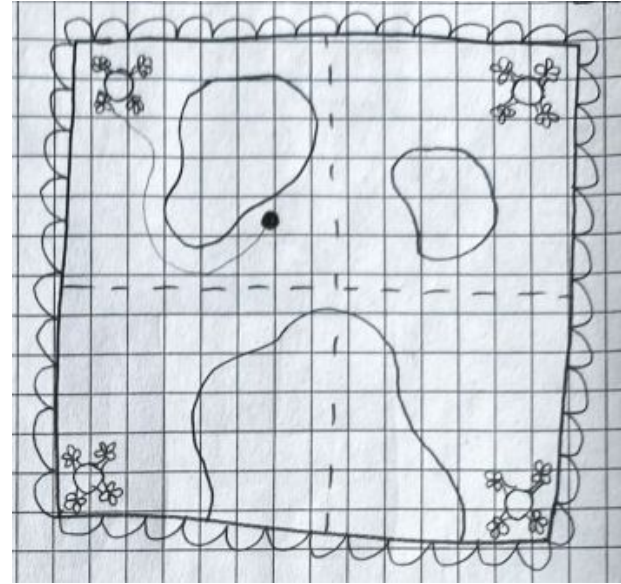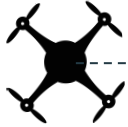
Requirements

- Functional:
    - Enable algorithm selection
    - Execute the chosen algorithm on the selected dataset
    - Allow users to input the number of drones
    - Ease of use for those unfamiliar with drone use or code
- Non-functional:
    - Flexibility in configuration
    - Privacy options
    - Consider web server response limitations
    - The architecture provided by ETG
    - Charging for web-based services

Image: https://uxwing.com/no-drone-sign-icon/

Engineering Standards

ISO/IEC 27000 family — Information security management : Our project is going to collect data from users and surrounding areas through drone flight, so it will be important for our information to be secure.

ISO 14000 family – Environmental management : Though our project consists of mostly software and some electronic drone usage, we will need to pay mind to having minimal environmental impact when it comes to drone flight.

ISO/IEC/IEEE International Standard – Software and systems engineering - Software testing : Our project will involve testing the algorithms of the drones' paths to ensure safe and efficient flights.

IEEE Standard for Aerospace Equipment Voltage and Frequency Ratings (IEEE 127) : our project deals directly with aerospace electronics, and will have to adhere to equipment standards in a variety of settings, especially is used in more urban environments.

Conclusion

In conclusion, the drone fleet management project aims to optimize drone response time for various user scenarios, including search and rescue, delivery, and infrastructure maintenance, while accounting for no-fly zones and other obstacles. By leveraging custom algorithms for geo-area partitioning, the system will allow for efficient monitoring and visualization of drone operations. The system's user interface will enable operators to interactively visualize drone paths and response times, ensuring practical application across different industries.