

# CS 5412 Project Idea

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## **Project Description:**

In this project, we would like to implement an application that captures flight data using flight plans and radar updates, and uses that data to revise flight plans which are sent out to traffic controllers to dispatch. Our goal would be to change the way flights are routed and operated to a system that takes both efficiency and environmental effects into consideration. To be more precise, we plan on offering the following suite of services as part of the application:

- Bad Weather Updates: One component of the system would be regularly checking for weather updates on the routes planned out. A change in weather would be factored into updating flight plans with some measure of urgency, depending on various factors, such as whether or not the flight is currently active and the extent of the change.
- Fuel Conservation: Another part of this system that factors route planning and updating would be fuel conservation. The objective would be to choose a route that minimizes, to some extent, the amount of fuel consumed by a flight.
- Flight Delays: The final component we would like to implement would be a way to minimize flight delays for traveling passengers (aka missed connections). This would require some sort of optimization algorithm that takes into account all of the passengers on sequential flights and make the best decision in order to minimize delays for a large amount of customers.

In addition to these suite of services that we plan to offer, we would also like to make our system extremely scalable using the concepts of fog and edge computing talked about in class. The data that's received from the sensors and radars does not matter on immediate updates; a few minutes of latency and delay is acceptable. This means that stale data for a couple of minutes behind would still make it feasible to build such a system for air traffic control. Trading off currentness of data for a scalable infrastructure will allow us to support as many clients as possible, getting data and making decisions as fast as possible. In order to make the project mimic the real world, we plan on using real data from the web, from websites such as <https://www.adsbexchange.com/data/#>. By using real world data, we can test our model and make adjustments to its scalability as we increase the amount and the speed at which we feed our system data.

## **Project Importance:**

The importance of this application is that it would be a huge time saver for passengers and a huge money saver for airlines and air traffic controllers. Being able to have an algorithm absolutely minimize the number of delays experienced by the majority of customers will be a huge time saver for passengers as well as save tons of money for the airlines who have to compensate passengers for thousands of missed connections everyday. In addition, optimizing fuel usage will save a lot of money for airlines, as well as reduce the carbon footprint that airplanes have on the environment. Being able to make this application work on a huge scale will allow us to be able to navigate and make an impact on a huge network of flights.