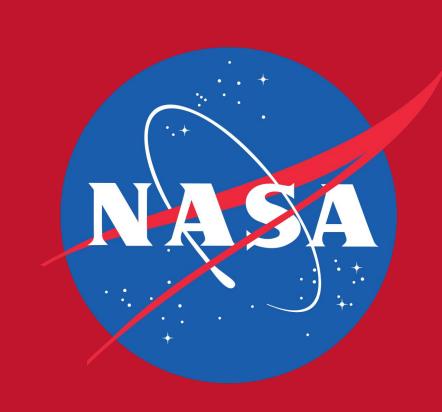


## Optimization of Airport Surface Planning and Scheduling

Team members: Anshu Rajendra, Heron Yang, Ritwik Rajendra Advisors: Robert A. Morris, Corina Pasareanu



#### Motivation







Cost

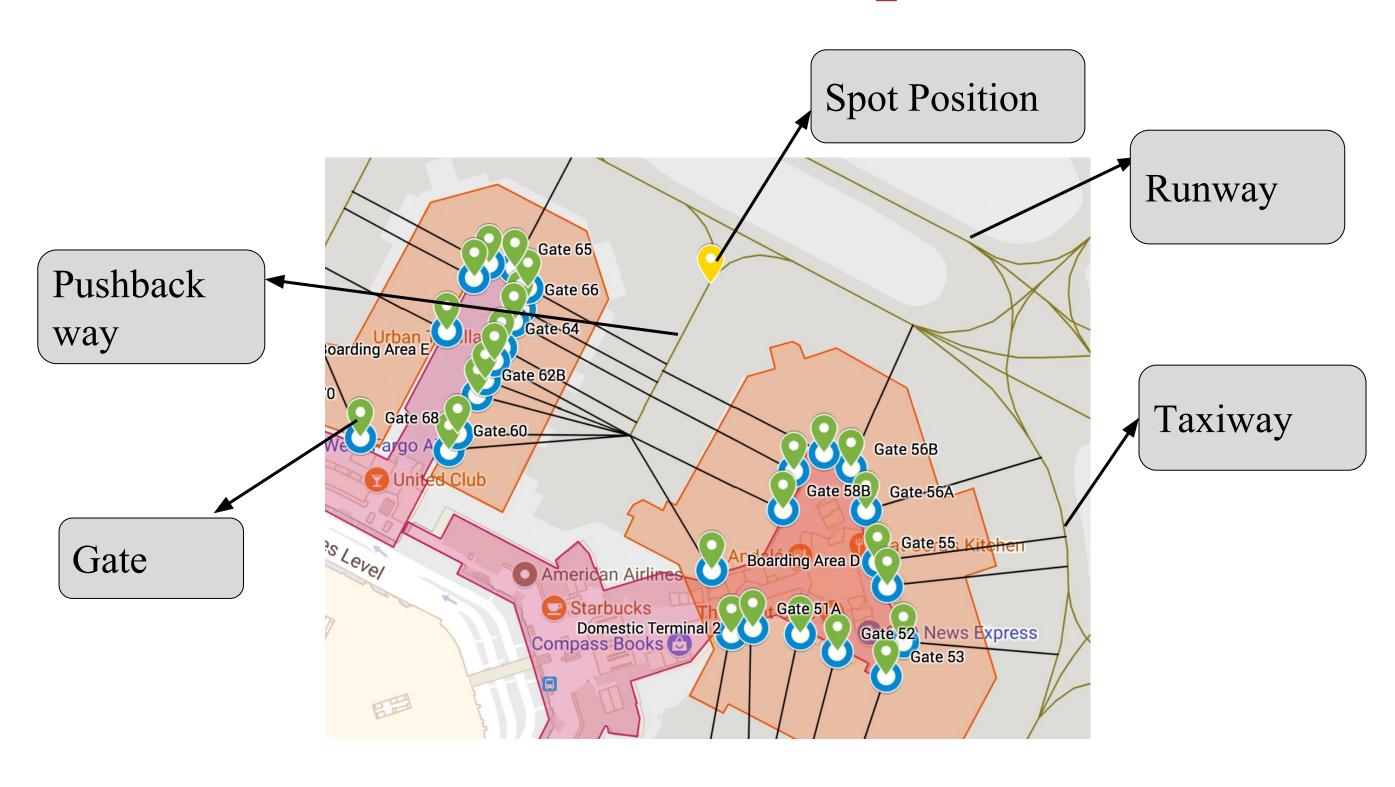
Environment

Safety

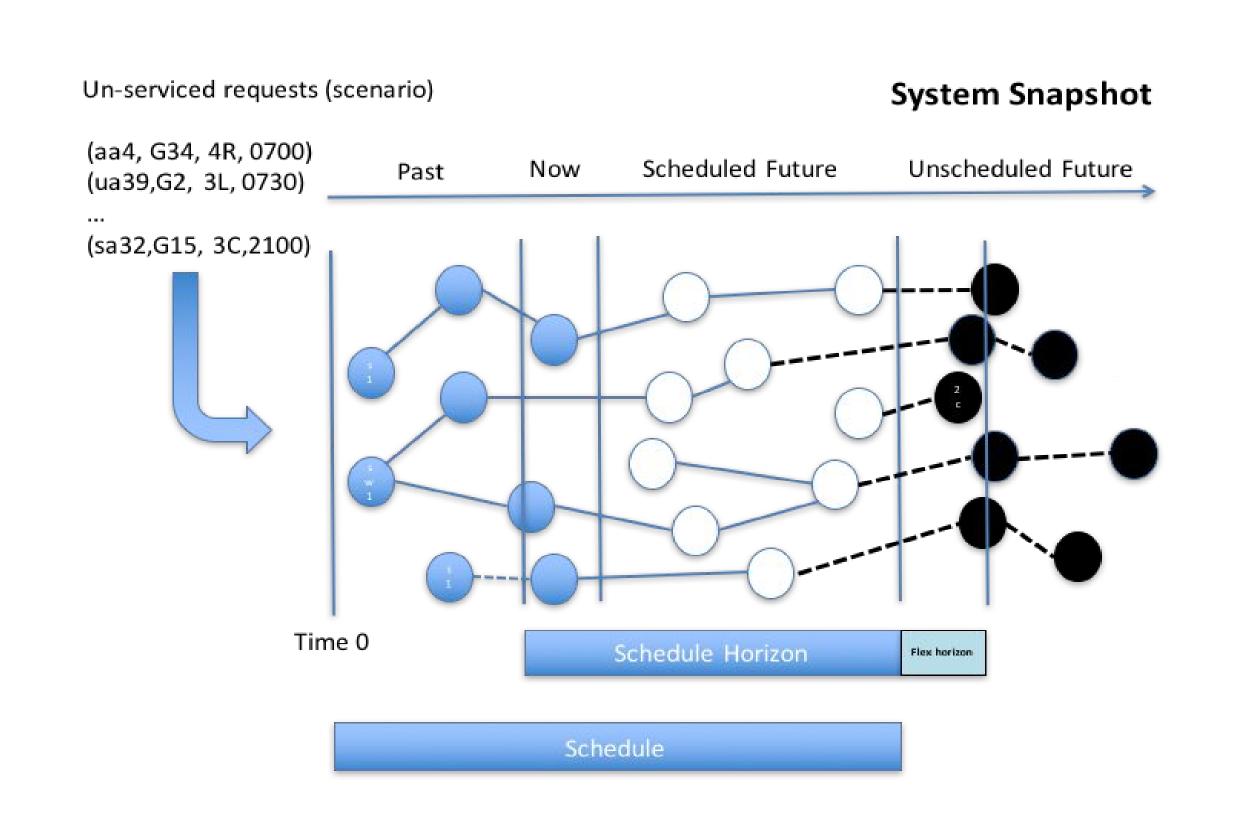
## Project Goals

- To create a generic airport simulation tool
- To add uncertainty into simulation and to analyze the performance of different scheduling algorithms
- To explore different auto-scheduling methods and to compare with current FCFS method.

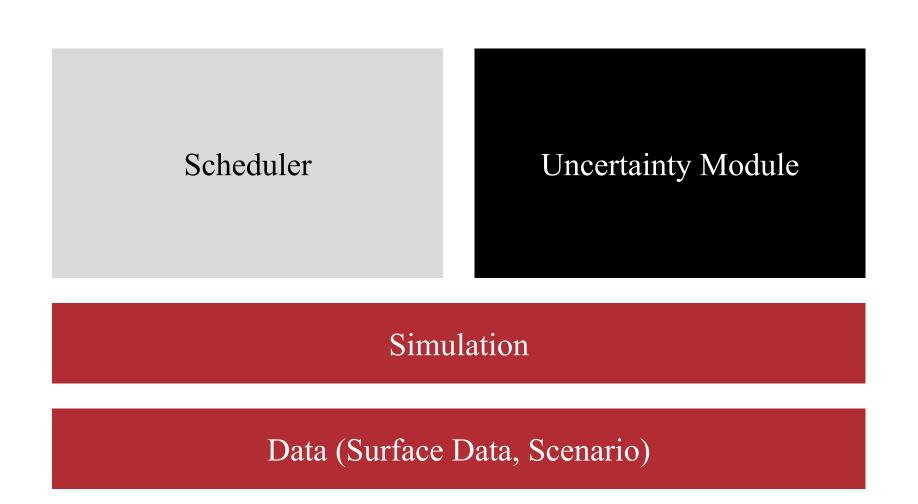
## **Know Your Airport**



## System Snapshot



#### Architecture



Designs an airport simulation works for multiple airports sharing the same link-node model.

#### Simulation

A generic airport simulation written in Python

Works with an external scheduler in runtime, and be able to show performances.

Be extensible for adding new constraints, features in the future.

## Scheduler

A scheduler for aircraft routes written in Python

Repeatedly generates schedules for aircrafts that enter the airport during the day.

Ensure that the schedules generated are free of conflicts in the absence of uncertainty.

Use the simulation to predict possible airport state in the future, and relax tightness at possible bottlenecks.

# Uncertainty Module

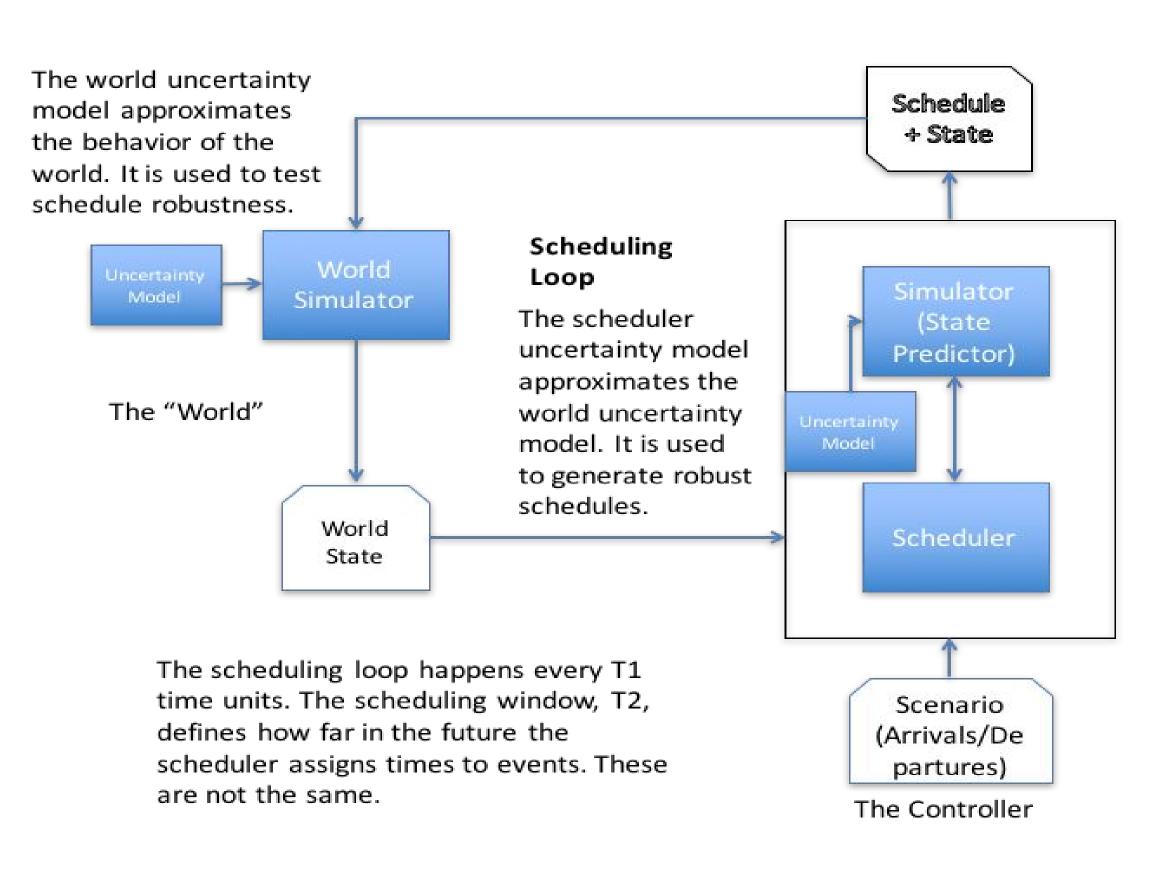
A module for simulating real-world uncertainty.

A generic module for uncertainty that can take into account multiple factors for calculating uncertainty.

Integrates with external scheduler and simulator in runtime. Controllable by user to inject randomness.

Takes into account terminal uncertainty at gates and runways.

#### Flow



#### Results

