Georgia Tech Stinger and Trolley System Analysis

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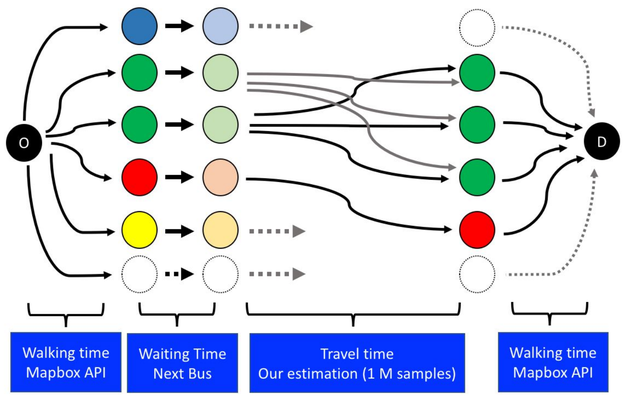
Summary

Objective: 1) Improve user experience of the Stinger Bus and Trolley system through a web-based dashboard for travel planning and bus behavior
2) Improve Parking & Transportation understanding of bus behavior through data visualizations

Approaches

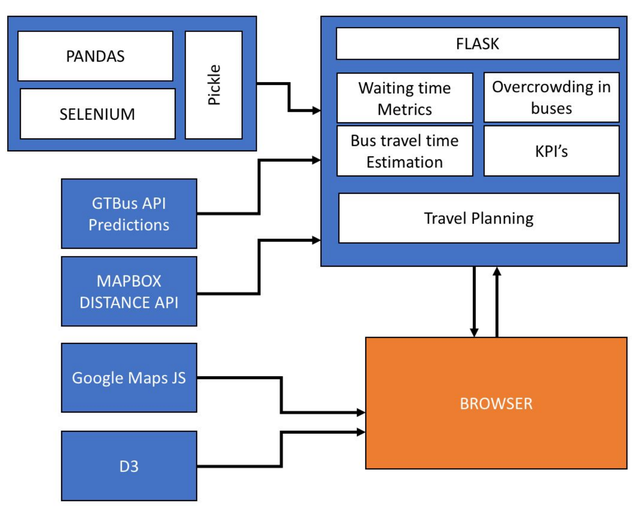
- Calculated the shortest path between two stops using Dijkstra's algorithm to help students plan travel



- Interfaced with Google Maps API to draw maps and bus routes

- Created interactive graphs and statistics using D3

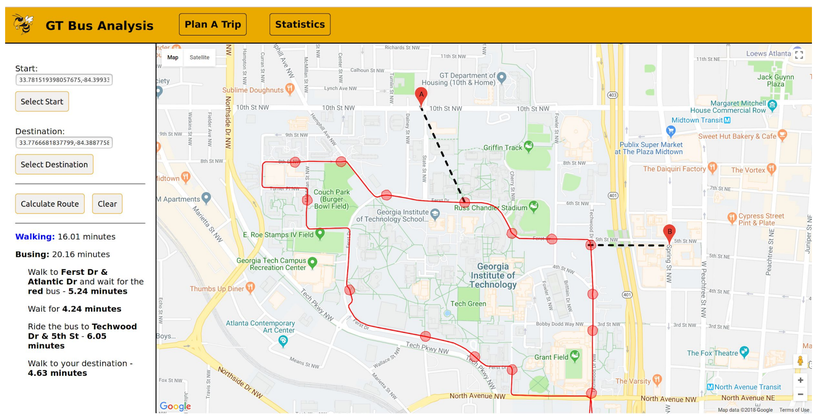
Flowchart of approaches:

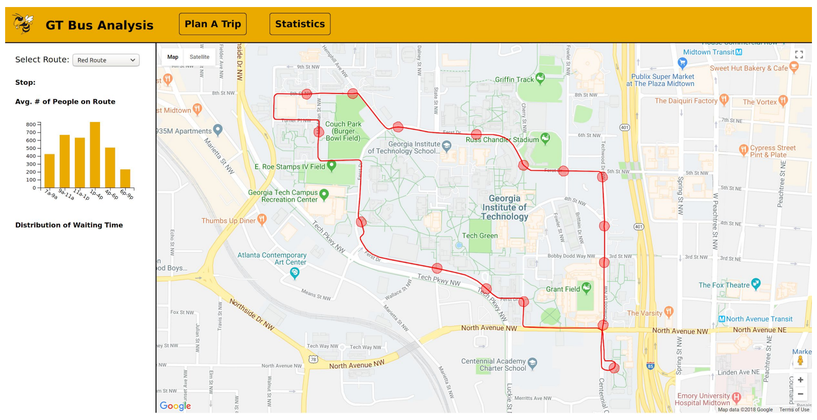


How is our approach innovative?

Our approach uses aggregate data to estimate time between two points. Previously, users only had access to current wait times.

User Interface of Dashboard





Data

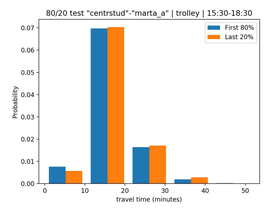
Our data is a combination of historical temporal data and live bus information. We used Python pandas to obtain, clean, and manipulate over a million data points.

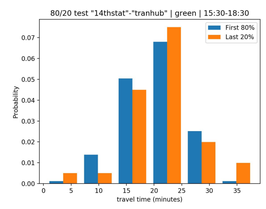
1. Scraped NextBus administrative dashboard using Selenium

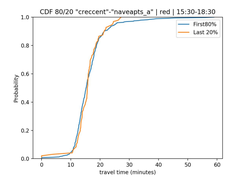
2. Accessed GT Buses API to obtain waiting times

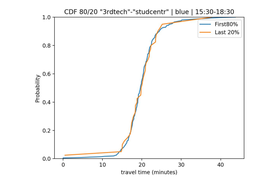
3. Downloaded P&T CSV file to obtain bus crowdedness

Experiments & Results









A comparison between the first 80% of our data samples and the last 20% of shows that the historical data filtered by day and time period correctly approximates future travel time.

We will measure:

1. How accurate do we model the behavior of the GT bus system?
   - Comparison of current travel times and wait times of buses with our predictions

2. Are users able to make travel decisions using our dashboard?
   - Survey students and administrators to determine the usability and value of our system

2. Is Parking & Transportation able to draw insights from our dashboard?
   - Conduct focus group with P&T to gather qualitative analysis of administrative functionality